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**AMENDMENT 2 TO THE FISHERY MANAGEMENT  
PLAN FOR U.S. WEST COAST FISHERIES FOR  
HIGHLY MIGRATORY SPECIES TO ADDRESS  
REVISED NATIONAL STANDARD 1 GUIDELINES**

**ENVIRONMENTAL ASSESSMENT**

PREPARED BY:

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**NATIONAL MARINE FISHERIES SERVICE  
SOUTHWEST REGION**

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**Glossary of National Standard 1 Guideline Concepts**

<b>Reference Point</b>	<b>Description</b>
Maximum Sustainable Yield (MSY) <i>600.310(e)(1)</i>	The largest long-term average catch or yield that can be taken from a stock or stock complex under prevailing ecological, environmental conditions and fishery technology characteristics (e.g., gear selectivity)
Optimum Yield (OY) <i>600.310(e)(3) and (e)(3)(iv)</i>	A decisional mechanism to address MSA and FMP objectives. OY definition(s) must account for the need to prevent overfishing. A long-term average amount of desired yield that accounts for economic, social, and ecological factors... an FMP must contain ACLs and AMs to achieve OY. See (e)(3)(iii) and (iv) for factors to be considered in determining OY.
Status Determination Criteria (SDC): <i>600.310(e)(2)</i>	The FMP must describe which one of two methods will be used to determine overfishing status: (1) $F > MFMT$ or reasonable proxy or (2) $Catch > OFL$ ; in both cases exceeds the threshold for 1 year or more
Maximum Fishing Mortality Threshold (MFMT)	The level of fishing mortality (F), on an annual basis, above which overfishing is occurring
Overfishing Limit (OFL)	Annual amount of catch that corresponds to the estimate of MFMT applied to a stock or stock complex's abundance expressed in terms of numbers or weight of fish
Minimum Stock Size Threshold (MSST)	The level of biomass below which the stock or stock complex is considered overfished
Acceptable Biological Catch (ABC) / ABC Control Rule <i>600.310(f)</i>	ABC is a level of a stock or stock complex's annual catch that accounts for the scientific uncertainty in the estimate of OFL and any other scientific uncertainty and should be based on the ABC control rule. ABC control rule means a specified approach to setting ABC for a stock or stock complex as a function of the scientific uncertainty in the estimate of OFL and any other scientific uncertainty. Councils should develop a process for receiving scientific information and advice used to establish ABC including the body that will apply the ABC control rule (calculate the ABC) and the review process. The SSC must recommend the ABC to the Council.
Annual Catch Limit (ACL); mechanisms for specifying ACLs <i>600.310(f)</i>	The level of annual catch of a stock or stock complex that serves as the basis for invoking AMs. ACL cannot exceed ABC but may be divided into sector-specific ACLs
Accountability Measures (AMs) <i>600.310(g)</i>	Management controls to prevent ACLs from being exceeded and to correct or mitigate overages of the ACL if they occur. There are two categories: inseason AMs and AMs for when the ACL is exceeded.
Annual Catch Target (ACT) (optional) <i>600.310(f)(6) &amp; (g)(2)</i>	An optional AM. An amount of annual catch that is the management target of the fishery, and accounts for management uncertainty in controlling catch at or below the ACL.

# CHAPTER 1 INTRODUCTION, INCLUDING PURPOSE AND NEED FOR THE PROPOSED ACTION

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## 1.1 Organization of the Document

This document provides background information about, and analysis of, a proposed amendment (Amendment 2) to the *Fishery Management Plan for U.S. West Coast Fisheries for Highly Migratory Species* (HMS FMP) to revise part of the FMP to ensure that it is consistent with guidelines to meet the objectives of National Standard 1 (NS1) in the Magnuson-Stevens Fishery Conservation and Management Act (MSA). NS1 states that “Conservation and management measures shall prevent overfishing while achieving, on a continuing basis, the optimum yield (OY) from each fishery for the U.S. fishing industry.” The MSA is the principal legal basis for fishery management of U.S. fisheries in the exclusive economic zone (EEZ) or on the high seas beyond the EEZ for vessels making landings at U.S. ports. The EEZ extends from the outer boundary of state waters at 3 nautical miles (nmi) to a distance of 200 nmi from shore.

In addition to addressing MSA mandates, this document is an environmental assessment (EA), pursuant to the National Environmental Policy Act (NEPA) of 1969, as amended. According to NEPA (Section 102(2)(C)), any “major Federal action significantly affecting the quality of the human environment” must be evaluated in an environmental impact statement (EIS). However, an agency may prepare an EA, which provides “sufficient evidence and analysis for determining whether to prepare an environmental impact statement.” The EA serves to disclose what impacts are anticipated, and determine if the agency can make a Finding of No Significant Impact. Based on a preliminary determination by National Marine Fisheries Service (NMFS) staff in consultation with Pacific Fishery Management Council (hereafter, Council) staff, implementing the proposed action is unlikely to result in significant impacts. Therefore, rather than preparing an EIS, NMFS and the Council have decided to prepare an EA. This document is organized so that it contains the analyses required under NEPA and other applicable law (see Chapter 6).

Environmental impact analyses have four essential components: 1) a description of the purpose and need for the proposed action; 2) a set of alternatives that represent different ways of accomplishing the proposed action; 3) a description of the human environment affected by the proposed action; and 4) an evaluation of the expected direct, indirect, and cumulative impacts of the alternatives. (The human environment includes the natural and physical environment, and the relationship of people with that

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environment, 40 CFR 1508.14.) These elements allow the decision-maker to look at different approaches to accomplishing a stated goal and understand the likely consequences of each choice or alternative. Based on this structure, the document is organized in six chapters:

- The remainder of Chapter 1 describes the purpose and need for the proposed action and considerations that went into the development of this EA.
- Chapter 2 outlines different alternatives that have been considered to address the purpose and need. The Council will choose a preferred alternative from among these alternatives.
- Chapter 3 describes the components of the human environment potentially affected by the proposed action (the “affected environment”). The affected environment may be considered the baseline condition, which would be potentially changed by the proposed action.
- Chapter 4 evaluates the effects of the alternatives on components of the human environment in order to provide the information necessary to determine whether such effects are significant, or potentially significant.
- Chapter 5 details how this action meets 10 National Standards set forth in the MSA (§301(a)).
- Chapter 6 provides information on those laws and Executive Orders, in addition to the MSA and NEPA, that an action must be consistent with, and how this action has satisfied those mandates.

## **1.2 The Proposed Action and Why the Council and NMFS are Considering It**

The proposed action is to revise relevant sections of the HMS FMP to ensure they are consistent with advisory guidelines published in Federal regulations at 50 CFR 600.310. The Guidelines describe fishery management approaches to meet the objectives of NS1 found in the MSA, Section 301. NS1 mandates that “Conservation and management measures shall prevent overfishing while achieving, on a continuing basis, the OY from each fishery for the U.S. fishing industry.” The Magnuson-Stevens Fishery Conservation and Management Reauthorization Act of 2006 (MSRA) amended the MSA to include new requirements for annual catch limits (ACLs) and accountability measures (AMs) and other provisions regarding preventing and ending overfishing and rebuilding fisheries. NMFS revised NS1 Guidelines in response to these changes in the MSA. The NS1 Guidelines were published in the Federal Register on January 16, 2009. The Guidelines are intended to meet the objectives of NS1 by providing guidance on:

1. Specifying maximum sustainable yield (MSY) and OY;
2. Specifying status determination criteria (SDC) so that overfishing and overfished determinations can be made for stocks and stock complexes that are part of a fishery;
3. Preventing overfishing and achieving OY, incorporation of scientific and management uncertainty in control rules, and adaptive management using ACLs and measures to ensure accountability (AM); and
4. Rebuilding stocks and stock complexes.

The revisions to the NS1 guidelines also dictate that fisheries undergoing overfishing have ACLs and AMs in place to end overfishing by 2010, and all fisheries to have ACLs and AMs in place to prevent or end overfishing by 2011, and beyond. However, a stock or stock complex may not require an ACL and AMs if it qualifies for an MSRA-defined exception. The most important of these with respect to highly migratory species is the so-called “international exception” for stocks managed under an international agreement to which the United States is a party. The NS1 Guidelines also have other provisions related

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to classifying stocks in the FMP. As part of this action the Council's Highly Migratory Species Management Team (HMSMT) evaluated all the species and stocks identified in the FMP in light of available information on catch to consider possible reclassification.

In summary, the Council is revising the HMS FMP to be consistent with revised NS1 Guidelines in order to more effectively prevent overfishing and rebuild overfished stocks, or stocks that may become overfished.

## **1.3 Scoping**

Public involvement is an important part of the scoping process. According to NEPA regulations (40 CFR 1501.7) scoping is "an early and open process for determining the scope of issues to be addressed and for identifying the significant issues related to the proposed action." Public scoping is designed to provide interested citizens, government officials, and tribes an opportunity to help define the range of issues and alternatives that should be evaluated in the EIS.

### **1.3.1 Council Process**

The Council process, which is based on stakeholder involvement and allows for public participation and public comment, has been the principal mechanism for public scoping in developing the proposed action for Amendment 2 and the related range of alternatives.

The Council initiated scoping for an amendment to the HMS FMP to address the revised NS1 Guidelines in April 2009. Initial scoping focused on classification of stocks in the FMP as either "in the fishery" and subject to management or as ecosystem component (EC) species and the application of a statutory exception to the requirement to set ACLs for stocks in fisheries managed under an international agreement in which the United States participates (see 50 CFR 660.310(h)(2)(ii)), referred to as the "international exception."

The HMSMT began deliberations to address the NS1 Guidelines on June 12 and again on September 14 2009; the second occasion was a joint meeting with the Scientific and Statistical Committee's (SSC's) HMS Subcommittee. During these meetings the HMSMT conducted a broader evaluation of management unit and monitored species in the FMP to consider re-classifying from one category to another (with monitored species becoming EC species) or dropping selected species from the FMP altogether. Another issue that was identified was assigning "primary FMP" status for selected species. The Guidelines state that "Councils should choose which FMP should be the primary FMP in which management objectives, SDC, the stock's overall ACL and other reference points for the stock are established" (§600.310(d)(7)). Since all the HMS FMP management unit species (MUS) and many of the monitored species are managed species in the Western Pacific Fishery Management Council's (WPFMC's) Pelagics Fishery Ecosystem Plan (FEP), coordination to identify the primary FMP may be needed. In cases where the Pelagics FEP is chosen as the primary FMP, the Pacific Council would not identify reference points for those stocks.

In November 2009 the Council reviewed HMSMT recommendations on the range of issues related to amending the FMP, and provided further guidance on developing alternatives based on the following topics identified by the HMSMT:

- 1) Classification of stocks in the HMS FMP as MUS or ECs
- 2) Potential application to MUS of the MSA international exception for ACLs requirements

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- 3) Determining the primary FMP for MUS covered by both the HMS FMP and the WPFMC's Pelagics FEP
- 4) Establishing biological reference points and AMs

The Council generally approved the HMSMT recommendations on these topics while narrowing the range of options for application of the international exception to a consideration of applying it to all MUS or all MUS with the exception of shortfin mako shark and common thresher shark. The rationale for continued consideration of ACLs for these two shark species was based on the fact the HMS FMP implemented harvest guidelines for these two species. They also directed the HMSMT to conduct a vulnerability analysis on shortfin mako, common thresher, and blue shark to assist in decision-making. The HMSMT met February 23-25, 2010, to review Council guidance, discuss the vulnerability analysis assignment, and further refine the alternatives per Council direction.

At their April 2010 meeting the Council reviewed a further refinement of HMSMT recommendations for the range of alternatives and adopted a set of alternatives for public review. These alternatives were made available to the public in the form of a preliminary partial draft of this EA included in the briefing materials for the Council's June 2010 meeting. The alternatives are described in Chapter 2.

At their June 2010 meeting the Council took final action to adopt a preferred alternative. This is Alternative 5, described in Chapter 2 of this EA, and addresses the four issue areas listed above.

The public had the opportunity to comment on the proposal, including the issues to be addressed and the range of alternatives, during Council and advisory body meetings.

# CHAPTER 2 DESCRIPTION OF THE ALTERNATIVES

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## 2.1 Introduction

The alternatives are organized around the following topics:

- 1) Classification of stocks in the FMP as either MUS or EC species, or otherwise dropped from the FMP
- 2) Application of the MSA international exception to ACLs and AMs for MUS
- 3) Determining the primary FMP for MUS also addressed by the WPFMC Pelagics FMP
- 4) Establishing Reference Points and AMs

The following sections detail issues considered under these topics, which in some cases are presented as different options for Council decision-making. Section 2.7 describes five alternatives, including the alternative of no action and the Council's preferred alternative, which combine responses to the issues outlined below into proposals for amending the HMS FMP to comply with the revised NSI Guidelines. Appendix A contains proposed changes to the HMS FMP.

## 2.2 Classification of Stocks in the FMP

### 2.2.1 Classification Criteria in the Original HMS FMP

The HMS FMP identifies both **managed species** and **monitored species** categories. Section 3.1 of the original HMS FMP discusses the classification criteria used to distinguish between these two categories. The list of criteria for classification as an MUS included:

1. *the species occurs in the Pacific Council management area*
2. *the species occurs in west coast HMS fisheries*
3. *the species is defined as highly migratory in the MSA or the Law of the Sea Convention*
4. the species is important (moderate to high value) in the landings or to the fishery
5. the species is managed by the Western Pacific Fishery Management Council (WPFMC)
6. sufficient data exists to calculate a bio-analytically based MSY, including a reasonable MSY proxy that is based, e.g., on catches and yields that are stable over time
7. the species possesses special biological characteristics (e.g., higher vulnerability as defined by the combination of low biological productivity and higher susceptibility to fisheries)

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The originally proposed HMS FMP stipulated that any species meeting the first three criteria on the list of MUS classification criteria would be strongly considered for inclusion. The Council chose to adopt the proposed action alternative, which was to include species “that are at least moderately important or of special conservation concern in West Coast HMS fisheries, and also managed by the WPFMC,” leading to the current list of 13 HMS FMP MUS. Tunas, swordfish, striped marlin and HMS sharks were deemed variously important to commercial and sports interests, dorado (dolphinfish) was noted to be of growing importance in the Southern California recreational fishing industry, and all were mentioned to be of concern to conservationists, particularly the HMS sharks.

The criteria for inclusion in the original FMP for monitoring purposes included the following:

1. species having a record of being caught in an HMS fishery and not covered by another FMP or state management regime
2. otherwise of special concern (e.g. elasmobranchs, which have relatively low productivity)

The original FMP noted that these species “often comprise a fishery’s bycatch,” and stated that they should be “monitored on a consistent and routine basis to the extent practicable. Sampling and coverage fraction will depend on the take rates of the species that are of the most concern. This monitoring is needed to evaluate the impact of HMS fisheries on incidental and bycatch species (as well as MUS) and to track the effectiveness of bycatch reduction methods.”

### **2.2.2 Revised National Standard 1 Classification Criteria**

The Guidelines introduce the concept of species “in the fishery,” for which catch limits must be considered, and **EC species**, an optional stock classification category in an FMP; EC species do not require active management. The current FMP monitored species category seems to be very similar in concept to the EC category. The HMSMT decided that this FMP amendment provides an opportunity to take a comprehensive look at the current list of MUS and monitored species to determine which should be considered “in the fishery” and subject to management and which are more appropriately classified as EC species, and whether some of the species currently listed as monitored species in the FMP should be dropped altogether, because they are rarely if ever caught in current west coast HMS fisheries.

According to revised NS1 Guidelines (600.310(d)(1)) all stocks in an FMP are considered to be “in the fishery” by default unless they are identified as EC species. There are several criteria that should be met for a species to be included in the EC category (§660.310(d)(5)). These are:

- Be a non-target stock/species;
- Not be subject to overfishing, approaching overfished, or overfished and not likely to become subject to overfishing or overfished in the absence of conservation and management measures; and,
- Not generally retained for sale or personal use, although retention is not by itself a reason for excluding a species from the EC category especially if EC classification is consistent with MSA conservation and management requirements.

One of the reasons given for including EC species in an FMP is for data collection purposes, which is consistent with the intent presented in the HMS FMP. EC species are not considered “in the fishery” but Councils should consider measures to minimize bycatch of these species consistent with National Standard 9. OY and reference points (MSY, overfishing limit, SDC, acceptable biological catch, ACL, ACT) do not need to be specified for EC species. One of the essential purposes behind current monitored species in the FMP and the EC species in the Guidelines is similar: to track species over time,

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periodically evaluate their status, and assess whether any management is needed under the FMP, in which case a monitored/EC species could be reclassified as MUS that is “in the fishery.” Other purposes for identifying EC species are to allow councils to consider measures “to minimize bycatch and bycatch mortality of EC species consistent with National Standard 9, and to protect their associated role in the ecosystem.”

Many of the monitored species are also currently WPFMC Pelagics Plan FMP MUS. Inclusion in another FMP could also be used as a criterion for determining whether a stock should be classified as an EC or in the fishery, if both Pelagics FMP fisheries and HMS FMP fisheries are catching the same stock. If a species is actively managed in that FMP, this would lend additional support to classifying it as an EC species if there is low susceptibility to HMS FMP fisheries. However, the WPFMC is considering reclassifying some of their MUS as EC species.

If a monitored/EC species is reclassified as an MUS in the fishery, then it should be determined:

- If the international exception should be applied, and
- If it is also an MUS in the Pelagics FMP, which FMP should be designated the primary FMP.

### **2.2.3 Reclassification Options**

The options described below are not mutually exclusive; one or more may be combined in the alternatives described in Section 2.7.

#### **1. Leave all management unit species as MUS, and reclassify all monitored species as EC species.**

Rationale: The inclusion of monitored species in the HMS FMP appears to have captured, for most monitored species, the intent of the new EC species in that they are not major components of the fishery, but have been captured, at least once, incidentally in the U.S. west coast HMS fisheries.

#### **2. Reclassify opah as an MUS.**

Rationale: Landings by gear types used to target HMS are significant (exceeding 50 mt annually in recent years) and the market for opah has apparently grown since the development of the HMS FMP. On the other hand, opah is not defined as highly migratory under the MSA or the UN Law of the Sea Treaty (Annex 1), one of the three criteria that the HMS FMP uses to consider inclusion as a managed species.

#### **3. Reclassify bigeye thresher and pelagic thresher as EC species.**

Rationale: These two species were included in the HMS FMP because they may be particularly vulnerable to the effects of fishing due to their life history characteristics. Like the other three pelagic shark species covered in the HMS FMP, they are long-lived, have low fecundity and are slow to mature. However, unlike the other three pelagic shark species in the HMS FMP, they are not taken in high numbers in the U.S. west coast HMS fisheries. Recent landings of each species average less than 5 mt annually, and pelagic threshers are mainly encountered during warm water El Niño years. Observer records for the swordfish drift gillnet (DGN) fishery demonstrate that estimated blue shark catch is at least ten-fold higher than either pelagic or bigeye thresher shark catch, on average. Neither pelagic thresher nor bigeye thresher is of recreational or commercial importance for U.S. west coast fisheries; in contrast, shortfin mako and common thresher sharks are recreationally and commercially important species. In addition, both the pelagic and bigeye thresher sharks are taken in greater numbers by

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fisheries operating outside the U.S. west coast EEZ, and both are managed under the WPFMC Pelagics FMP.

## 4. Reclassify 11 or 12 monitored species as EC species.

Rationale: Table 2-1 shows the proposed reclassification of monitored species under this option. (Opah is shown in bold to emphasize the possible reclassification as MUS under Option 2. Data on recent landings is shown in Table 3-5.) All species proposed to be dropped from the FMP with the exception of bat ray and leopard shark have average annual landings of less than 1 mt over the past 9 years. Upon closer examination, the relatively higher level of reported bat ray landings was taken by purse seine vessels targeting non-HMS coastal pelagic species such as mackerel, sardine, and anchovy.

Leopard sharks are benthic dwelling, coastal sharks; although the reported annual recreational catch is relatively high, it is unlikely that leopard sharks are actually taken while targeting HMS. Furthermore, leopard sharks are included in the Council’s Groundfish FMP.

Twelve monitored species would be reclassified as EC species under this option (note that opah, which in the option above would be reclassified as an MUS, is included here among these 12 species). Most of these have landings less than 1 mt annually. Pacific bonito, louver, escolar, and bat ray have had landings over 1 mt in recent years (see Table 3-5)

**Table 2-1. Option 4 on reclassification options for current HMS FMP monitored species.**

Species	Commercial Landings Reported
<b>Do Not Reclassify EC</b>	
1. Bat ray, <i>Myliobatis californica</i>	Yes
2. Black marlin, <i>Makaira indica</i>	
3. Blacktip shark, <i>Carcharhinus limbatus</i>	
4. Blue marlin, <i>Makaira nigricans</i>	
5. Dusky shark, <i>C. obscurus</i>	
6. Lancetfishes, Alepisauridae	
7. Leopard shark, <i>Triakis semifasciata</i>	Yes
8. Manta/Mobula rays, Mobulidae	
9. Oarfish, <i>Regalecus glesne</i>	
10. Oceanic whitetip shark, <i>C. longimanus</i>	
11. Pacific moonfish, <i>Selene peruviana</i>	
12. Pacific sailfish, <i>Istiophorus platypterus</i>	
13. Pacific saury, <i>Cololabis saira</i>	
14. Prickly shark, <i>Echinorhinus cookei</i>	
15. Rainbow runner, <i>Elagetyis bipinnulata</i>	
16. Salmon shark, <i>Lamna ditropis</i>	Yes
17. Shortbill spearfish, <i>Tetrapturus angustirostris</i>	
18. Silky shark, <i>C. falciformis</i>	Yes
19. Six gill shark, <i>Hexanchus riseus</i>	
20. Soupfin shark, <i>Galeorhinus galeus</i>	
21. Spiny dogfish, <i>Squalus acanthias</i>	
22. Whale shark, <i>Rincodon typus</i>	
<b>23. Opah, <i>Lampris guttatus</i></b>	Yes

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Species	Commercial Landings Reported
<b>Reclassify as EC Species</b>	
1. Black skipack, <i>Euthynnus lineatus</i>	Yes
2. Bullet mackerel (tuna), <i>Auxis rochei</i>	
3. Common mola, <i>Mola mola</i>	
4. Escolar, <i>Lepidocybium flavobrunneum</i>	Yes
5. Hammerhead sharks, Sphyrnidae	Yes
6. Louvar, <i>Luvarus imperialis</i>	Yes
7. Oilfish, <i>Ruvettus pretiosus</i>	Yes
8. Pacific bonito, <i>Sarda chiliensis</i>	Yes
9. Pacific pomfret, <i>Brama japonica</i>	Yes
10. Pelagic stingray, <i>Pteroplatytrygon violacea</i>	Yes
11. Wahoo, <i>Acanthocybium solandri</i>	Yes

## 5. Reclassify 6 monitored species as EC species

**Rationale:** The following criteria were identified to support the reclassification of non-MUS as either EC species or not in the HMS FMP:

1. Reclassify as EC species any species with less than 1 mt average annual landings between 2000-2008 but with appreciable catch in observer data.
2. Absent other overriding factors, reclassify species with more than 1 mt and less than 5 mt of landings as EC species and species with 1 mt or less or 5 mt and greater average landings from 2000-2008 as not in the HMS FMP.

Two monitored species with relatively high landings, opah and Pacific bonito, would not be included in the FMP under this alternative either as MUS or EC species. These species do not appear to qualify as EC species since they are targeted and landed commercially in significant quantities and may also be caught in recreational fisheries. (Because of these landings, Option 2 proposes reclassifying opah as an MUS.) Neither species is included in the United Nations Convention on the Law of the Sea Annex 1 list in the definition of HMS in the MSA.

Both species are subject to management by the State of California. California Department of Fish and Game manages bonito with port sampling and size limits. General recreational bag limits in California govern catch of both species.

For these reasons, there does not appear to be a compelling rationale for Federal management of these two species. (Both were considered for inclusion as managed species when the FMP was developed, but were only identified as monitored species.)

Table 2-2 shows the reclassification of monitored species under this option.

**Table 2-2. Option 5 on reclassification options for current HMS FMP monitored species.**

Species	Commercial Landings Reported
<b>Do Not Reclassify as EC Species</b>	
1. Bat ray, <i>Myliobatis californica</i>	Yes
2. Black marlin, <i>Makaira indica</i>	
3. Black skipack, <i>Euthynnus lineatus</i>	Yes

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Species	Commercial Landings Reported
4. Blacktip shark, <i>Carcharhinus limbatus</i>	
5. Blue marlin, <i>Makaira nigricans</i>	
6. Bullet mackerel (tuna), <i>Auxis rochei</i>	
7. Dusky shark, <i>C. obscurus</i>	
8. Hammerhead sharks, Sphyrnidae	Yes
9. Leopard shark, <i>Triakis semifasciata</i>	Yes
10. Manta/Mobula rays, Mobulidae	
11. Oarfish, <i>Regalecus glesne</i>	
12. Oceanic whitetip shark, <i>C. longimanus</i>	
13. Oilfish, <i>Ruvettus pretiosus</i>	Yes
14. Pacific bonito, <i>Sarda chiliensis</i>	Yes
15. Pacific moonfish, <i>Selene peruviana</i>	
16. Pacific pomfret, <i>Brama japonica</i>	Yes
17. Pacific sailfish, <i>Istiophorus platypterus</i>	
18. Pacific saury, <i>Cololabis saira</i>	
19. Prickly shark, <i>Echinorhinus cookei</i>	
20. Rainbow runner, <i>Elagatis bipinnulata</i>	
21. Salmon shark, <i>Lamna ditropis</i>	Yes
22. Shortbill spearfish, <i>Tetrapturus angustirostris</i>	
23. Silky shark, <i>C. falciformis</i>	Yes
24. Six gill shark, <i>Hexanchus riseus</i>	
25. Soupfin shark, <i>Galeorhinus galeus</i>	
26. Spiny dogfish, <i>Squalus acanthias</i>	
27. Whale shark, <i>Rincodon typus</i>	
<b>28. Opah, <i>Lampris guttatus</i></b>	Yes
<b>Reclassify as EC Species</b>	
1. Common mola, <i>Mola mola</i>	
2. Escolar, <i>Lepidocybium flavobrunneum</i>	Yes
3. Lancetfishes, Alepisauridae	
4. Louvar, <i>Luvarus imperialis</i>	Yes
5. Pelagic stingray, <i>Pteroplatytrygon violacea</i>	Yes
6. Wahoo, <i>Acanthocybium solandri</i>	Yes

**2.3 Applying the NS1 Guideline’s “International Exception”**

Section 660.310(h)(2)(ii) of the revised NS1 Guidelines, relating to international fishing agreements, applies to stocks or stock complexes subject to management under an international agreement, which is defined as “any bilateral or multilateral treaty, convention, or agreement which relates to fishing and to which the United States is a party.” For stocks that meet this exception, only MSY, OY, and SDCs have to be defined. Acceptable biological catch (ABC), ACLs, and AMs are not required. Once any changes to the list of HMS FMP MUS are determined, the Council would need to decide which of these would be subject to the MSA “international exception.”

Opah, if reclassified as an MUS, would be subject to the international exception under all of the following options.

**1. Apply the international exception to all of the HMS MUS**

The rationale for this alternative is that both the Inter-American Tropical Tuna Commission (IATTC) and Western and Central Pacific Fisheries Commission (WCPFC) (the two regional fishery management organizations that manage HMS stocks in the Pacific at the international level) include general statements in their charter documents asserting broad management authority over all HMS. Article 1 of the IATTC Antigua Convention, which entered into force August 27, 2010, defines fish stocks covered by this Convention as “stocks of tunas and tuna-like species and other species of fish taken by vessels fishing for tunas and tuna-like species in the Convention Area.” Article 2 of the WCPFC Convention states “The objective of this Convention is to ensure, through effective management, the long-term conservation and sustainable use of highly migratory fish stocks in the western and central Pacific ...” Article 1 defines highly migratory fish stocks as “all fish stocks of the species listed in Annex 1 of the 1982 Convention occurring in the Convention Area, and such other species of fish as the Commission may determine.” All of the HMS MUS are found on the referenced Annex 1 list.

Furthermore, the WPFMC has indicated that it is considering applying the international exception to all MUS in their Pelagics FMP after reclassifying selected MUS as EC species (personal communication from Paul Dalzell, Senior Staff Scientist, WPFMC). Since all HMS FMP MUS are also Pelagics FMP MUS, applying the international exception to all HMS FMP MUS would be consistent with the WPFMC’s approach. The two councils should ensure consistency in their treatment of these stocks with respect to the international exception and, as necessary, agree upon which will become the primary FMP (see Section 2.4 below).

The regional fishery management organizations (RFMOs) regularly conduct stock assessments for the tuna and billfish MUS in the HMS FMP. Conservation measures have been adopted, or are under consideration for many of the species in the HMS FMP. Table 2-3 summarizes information on stock assessments and RFMO activities.

**Table 2-3. Summary of stock assessments and RFMO conservation measures for HMS FMP MUS.**

Species (stocks)	Assessment and conservation measures
<b>Tunas</b>	
Albacore tuna, <i>Thunnus alalunga</i> (NPO)	Regularly assessed by the ISC. IATTC and WCPFC conservation measures in place.
Bigeye tuna, <i>T. obesus</i> (EPO, WCPO)	Regularly assessed by WCPFC and IATTC and both RFMOs have conservation measures in place.

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Species (stocks)	Assessment and conservation measures
Skipjack tuna, <i>Katsuwonus pelamis</i> (EPO, WCPO)	Regularly assessed by the WCPFC and IATTC; no specific conservation measure in place but both RFMOs are addressing purse seine fleet capacity and the negative impacts of FAD fishing.
Bluefin tuna, <i>T. orientalis</i> (NPO)	Regularly assessed by the ISC; the WCPFC adopted a conservation measure in 2009.
Yellowfin tuna, <i>T. albacares</i> (EPO, WCPO)	Regularly assessed by WCPFC and IATTC and both RFMOs have conservation measures in place.
<b>Billfish</b>	
Striped marlin, <i>Tetrapturus audax</i> (NPO, EPO)	Occasionally assessed by the ISC and IATTC; WCPFC considered conservation measure in 2009 to be developed further in 2010.
Swordfish, <i>Xiphias gladius</i> (NPO, SEPO)	Occasionally assessed by the ISC and IATTC; WCPFC has conservation measure for SP stock.
<b>Sharks</b>	
Bigeye thresher shark, <i>Alopias superciliosus</i>	NMFS has occasionally assessed selected species; IATTC and WCPFC adopted conservation measures for sharks (C-05-03, CMM-2008-06). The WCPFC identifies "key shark species" as blue shark, oceanic whitetip shark, mako sharks, silky sharks, and thresher sharks. The ISC formed a Shark Working Group in 2010 with the intention of conducting shark stock assessments in the future. IATTC is in early stages of conducting stock assessments on silky and oceanic white tip sharks.
Blue shark, <i>Prionace glauca</i>	
Common thresher shark, <i>A. vulpinus</i>	
Pelagic thresher shark, <i>A. pelagicus</i>	
Shortfin mako shark, <i>Isurus oxyrinchus</i>	
<b>Other</b>	
Dorado (dolphin), <i>Coryphaena hippurus</i>	IATTC has consolidated bycatch resolution referencing dorado (C-04-05); WCPFC has nonbinding resolution on bycatch species
<b>Possible Additional MUS</b>	
Opah, <i>Lampris guttatus</i>	IATTC has consolidated bycatch resolution (C-04-05); WCPFC has nonbinding resolution on bycatch species

### 2. Apply the international exception to all MUS except for common thresher shark and shortfin mako shark

Common thresher shark and shortfin mako shark are important species in west coast EEZ fisheries, and the HMS FMP established harvest guidelines for common thresher and shortfin mako sharks. This reflects the fact that west coast fisheries catch these species in more than negligible quantities. Thus, even though there is evidence that RFMOs are managing shark species included in the HMS FMP, it may be appropriate to consider adopting ACLs (and perhaps reevaluating the current harvest guidelines) for these two species.

### 3. Apply the international exception for all MUS except for common thresher shark

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Although a large portion of the common thresher shark stock appears to inhabit Mexico waters and they are taken in large numbers in nearshore fisheries there, the best available science indicates that the range of the common thresher shark taken in the U.S. west coast fisheries is likely limited to the U.S. EEZ and the Mexico EEZ off the northern portion of Baja California, with very limited movement beyond to the north and west. Collaborative research among SWFSC scientists, Scripps Institute of Oceanography and CICESE, Ensenada, Mexico, demonstrates a significant artisanal fishery for common thresher sharks off northern Baja, yet the fractional catch by Mexico fisheries of the common thresher shark stock is estimated to have been either stable or in decline since the development of the HMS FMP, due to recent regulatory changes affecting shark fisheries. Accurate landings estimates for the Mexico fleet are not available, yet the stock is relatively confined and U.S. west coast landings likely comprise a greater proportion of the total stockwide catch than for any of the other pelagic shark MUS.

## 2.4 Determining the Primary FMP

Section 600.310(d)(7) of the Guidelines states that councils should choose which FMP will be the primary FMP in which management objectives and other requirements of the Guidelines will be established in cases where a stock or species is identified in more than one FMP. All of the HMS FMP MUS are also currently MUS in the WPFMC's Pelagics FMP; therefore, it is necessary to determine which FMP will identify MSY, OY, SDC, and other management objectives. For stocks subject to the international exception (most or all under both FMPs) only MSY, SDCs, and OY need to be specified. Both councils could rely on RFMO-sponsored stock assessments to identify these reference points, if available.

The first principal for determining the primary FMP is to consider stocks (geographically separate populations) rather than a species across its entire range. Where stock structure is understood, as with the tropical tunas, separate stocks have been identified in the eastern Pacific Ocean (EPO) and western-central Pacific Ocean (WCPO). As a general principal, the WPFMC's Pelagics FMP would be the primary FMP for stocks in the WCPO and the HMS FMP would be the primary FMP for stocks in the EPO. Species with a single stock across the North Pacific would be considered on a case-by-case basis.

A second important principal for determining the primary FMP is the importance of the species or stock for the fisheries managed under the respective FMPs. For species where current understanding identifies a single stock across the North Pacific, or where stock structure is not well understood, this principal would be another consideration in determining the primary FMP.

The division of responsibility between NMFS Southwest and Pacific Islands Regions and Science Centers is a third consideration. The regions have divided responsibilities for coordinating participation in RFMO forums, for example, and the science centers divide responsibility for developing stock assessments (which may be developed through the RFMO forums with participation by scientists from national government agencies). Finally, where stock structure is poorly understood, and MSY may be specified for a local (west coast EEZ) portion of the stock (see discussion below), the HMS FMP would report reference points for that local stock. Table 2-4 shows possible assignments of managed species between the HMS FMP and the Pelagics FMP, based on these considerations and discussions among the staffs of the two councils and their respective management teams.

HMS stock structure is an active area of research, and scientific understanding of stock structure may change over time. Therefore, a stock-based approach to addressing the primary FMP issue will have to take into account potential changes in such scientific understanding. Greater stock partitioning or lumping may require the WPFMC and PFMC to reconsider designation of the primary FMP. For this reason the proposed designations outlined in Table 2-4 would not be specified in the HMS FMP. Instead, the FMP will be amended to discuss the process by which the determination of the primary

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FMP will be made in consultation with the WPFMC, allowing changes to primary FMP designations without the need to again amend the FMP.

Although MUS would be identified at the stock level for the purpose of identifying reference points in the respective FMPs, the PFMC would continue to maintain a Pacific-wide management interest in the species, and therefore report reference points for WCPO stocks based on what is reported by the WPFMC.

**Table 2-4. Potential primary FMP for HMS MUS.**

Species	Potential Primary FMP Designations
<b>Tunas</b>	
Albacore tuna, <i>Thunnus alalunga</i> (NPO)	HMS FMP
Bigeye tuna, <i>T. obesus</i> (EPO, WCPO)	EPO: HMS FMP / WCPO: Pelagics FMP
Skipjack tuna, <i>Katsuwonus pelamis</i> (EPO, WCPO)	EPO: HMS FMP / WCPO: Pelagics FMP
Bluefin tuna, <i>T. orientalis</i> (NPO)	HMS FMP
Yellowfin tuna, <i>T. albacares</i> (EPO, WCPO)	EPO: HMS FMP / WCPO: Pelagics FMP
<b>Billfish</b>	
Striped marlin, <i>Tetrapturus audax</i> (NPO, EPO)	Pelagics FMP (NPO) / HMS FMP (EPO)
Swordfish, <i>Xiphias gladius</i> (NPO, EPO)	Pelagics FMP (NPO) / HMS FMP (EPO)*
<b>Sharks</b>	
Bigeye thresher shark, <i>Alopias superciliosus</i>	May be classified as EC species under HMS FMP
Blue shark, <i>Prionace glauca</i> (NPO)	HMS FMP
Common thresher shark, <i>A. vulpinus</i>	HMS FMP (local stock)
Pelagic thresher shark, <i>A. pelagicus</i>	May be classified as EC species under HMS FMP
Shortfin mako shark, <i>Isurus oxyrinchus</i>	HMS FMP (local stock)
<b>Other</b>	
Dorado (dolphin), <i>Coryphaena hippurus</i>	HMS FMP (local stock)
<b>Possible Additional MUS</b>	
Opah, <i>Lampris guttatus</i>	HMS FMP (local stock)

\* The HMS FMP identified EPO swordfish as the managed stock. IATTC conducts stock assessments on EPO swordfish. Recent genetics studies, fishery and demographics data conclude that the NEPO and SEPO stocks may be distinct. The latest IATTC swordfish assessment was conducted for the SEPO only. Due to uncertainty about stock structure, the primary FMP for the NPO stock would be the Pelagics FEP while responsibility for reporting on EPO assessments would be covered under the HMS FMP.

## 2.5 Establishing Reference Points, ACLs, and Accountability Measures

### 2.5.1 Process for Revising Numerical Estimates of MSY and OY

The methods for determining MSY (or proxies), OY, and SDC, including the overfishing limit (OFL) are described in the FMP. Existing numerical estimates of MSY and OY in the FMP (shown in FMP Table 4-3) will be retained. Upon the receipt of any new information based on the best available science, the Council may adjust the numerical estimates of MSY, OY, and SDC periodically. Two options are considered:

**Option 1:** The HMSMT proposes MSY and OY estimates based on the best available science, which are included in the draft Stock Assessment and Fishery Evaluation (SAFE) document submitted to the Council in June of the biennial management cycle described in Chapter 5 of the HMS FMP. The SSC

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reviews the estimates and makes a recommendation on their suitability for management. The Council reviews these recommendations and provides guidance to the HMSMT on whether any updated estimates, if any, should be included in the final SAFE document provided in September of the biennial process.

**Option 2:** Under this option a process similar to Option 1 is used but with an additional step. The HMSMT identifies the numerical estimates in the draft SAFE in June and the SSC reviews and makes a recommendation on their suitability. The Council would then decide whether to adopt updated numerical estimates of MSY and OY, which would be submitted as recommendations for NMFS to review as part of the biennial process. This provides the opportunity for Secretarial review of revised MSY and OY estimates. In this process the Council takes final action in November and then NMFS engages in rulemaking to implement the specifications on any management measures proposed by the Council.

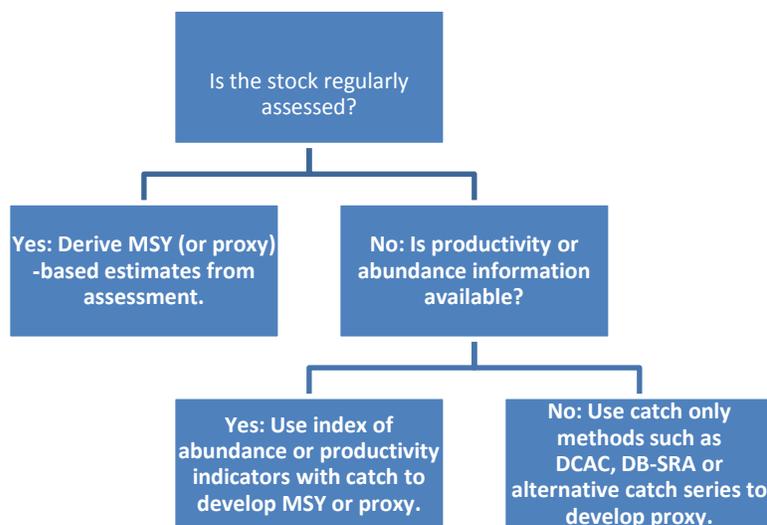
As discussed below, if an RFMO formally adopts reference points for the purpose of management, these would generally take precedence. However, as described in the options above, the Council would engage in a review process before adopting them as appropriate for management.

Under both options changes in the methods for determining MSY and OY are being proposed, which would differ from the method currently described in the FMP, and therefore would require an FMP amendment. Revised estimates of MSY, OY, and SDC would also be published periodically in the HMS SAFE document.

## 2.5.2 Reference Points Required For All Managed Stocks

### 2.5.2.1 MSY or an MSY Proxy

Figure 1 shows the framework for determining MSY. Decisions are based upon whether or not a stock assessment with MSY-based estimates is available and whether or not a time series of stockwide catch is available. All additional information on stock productivity should also be taken into consideration when determining MSY and the other reference points.



**Figure 1. Proposed decision framework for determining MSY.**

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Category 1, regularly assessed stocks: As part of the biennial process the HMSMT will review recent stock assessments and submit a draft SAFE document for review at the June Council meeting containing MSY estimates, noting if they are a change from the current value. The SSC reviews these estimates. If the SSC finds the assessment results creditable, the values will be recommended to the Council as the appropriate MSY-based reference points for the stock. In the event that the SSC finds the reference points undesirable for management purposes, they may recommend changes in the way that MSY is estimated in the assessment. Because HMS assessments are generally conducted by working groups outside of the Council process, if the Council adopts these recommendations they would be forwarded to the RFMO conducting or sponsoring the stock assessment through the U.S. delegation for consideration when conducting future assessments. If the Council finds the MSY estimate appropriate, and it differs from the current estimate, the Council submits the revised estimate to NMFS for review. If they determine that estimate is insufficient they could recommend to retain any current MSY estimate in the FMP or regulations, or propose an alternate estimate.

Category 2, unassessed stocks with catch history and additional information on relative abundance or stock productivity: The HMSMT compiles the best available stockwide catch data, or if not available, regional or local catch data and all additional information on a stock's productivity including relative abundance or catch/effort data if available. MSY or proxy estimates will be developed based on the catch time series and additional information. The relative impact of U.S. west coast fisheries may help to inform decisions on selecting appropriate reference points. As part of the biennial process, the HMSMT will propose an MSY or proxy and justification to the SSC for review. Based on SSC advice the Council may recommend a revision to a current MSY to NMFS.

Category 3, unassessed stocks with catch history but lacking further information on relative stock abundance or productivity: The HMSMT compiles the best available stockwide catch data, or if not available, regional catch data. A catch-based method such as the Depletion Corrected Average Catch (DCAC), Depletion Based Stock Reduction Analysis (DB-SRA)(MacCall 2009), or in the case of a relatively stable catch history without indications of stock depletion, an average of selected catch levels may be chosen to represent a proxy MSY. As above, through the biennial process the Council may recommend to NMFS a change in the published value for MSY or proxy.

### 2.5.2.2 Status Determination Criteria

The Guidelines state that SDC “must be expressed in a way that enables the Council to monitor each stock or stock complex in the FMP, and determine annually, if possible, whether overfishing is occurring and whether a stock or stock complex is overfished” 660.310(e)(2)(ii).

#### **Overfishing Threshold**

To determine if overfishing is occurring a council may use the maximum fishing mortality threshold (MFMT), which “may be expressed either as a single number (a fishing mortality rate or F value), or as a function of spawning biomass or other measure of reproductive potential” 660.310(e)(2)(ii)(A)(1) or the OFL, “the annual amount of catch that corresponds to the estimate of MFMT applied to a stock or stock complex's abundance and is expressed in terms of numbers or weight of fish” 660.310(e)(2)(i)(D). According to the Guidelines, exceeding either the MFMT or the OFL for a period of 1 year or more constitutes overfishing.

The HMS FMP identifies a default calculation,  $MFMT = F_{MSY}$ . For vulnerable species, an alternative calculation is proposed for identifying OY determined in terms of  $F = 0.75 F_{MSY}$ . The Guidelines define vulnerability as follows:

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A stock's vulnerability is a combination of its productivity, which depends upon its life history characteristics, and its susceptibility to the fishery. Productivity refers to the capacity of the stock to produce MSY and to recover if the population is depleted, and susceptibility is the potential for the stock to be impacted by the fishery, which includes direct captures, as well as indirect impacts to the fishery (e.g., loss of habitat quality). 660.310(d)(10)

Under this amendment no change is proposed to the calculation of the overfishing threshold ( $MSST = F_{MSY}$ ), except that it would be expressed as an OFL or fishing mortality rate, as appropriate. The OFL estimate for each managed stock would be reported in the SAFE, published annually. If either Pacific RFMO adopts a fishing mortality-based reference point for an HMS stock, that reference point would be reported, after SSC review.

For vulnerable species a precautionary reduction from the default OY calculation would be considered on a case-by-case basis, based on information about the vulnerability of the stock. The FMP currently describes a precautionary threshold of  $0.75 F_{MSY}$ . The FMP would be amended to emphasize the case-by-case approach with  $0.75 F_{MSY}$  as a starting point from which to consider alternative values.

The FMP identifies the managed shark species, bluefin tuna, and striped marlin as vulnerable. Under this amendment the FMP would be revised so that vulnerable species would not be specified in the FMP itself. Instead, the HMSMT would periodically evaluate the vulnerability of selected stocks when formulating a recommendation to the SSC on respecifying MSY and/or SDCs.

### Overfished Threshold

The minimum stock size threshold (MSST) is used to determine if a stock is overfished. "The MSST or reasonable proxy must be expressed in terms of spawning biomass or other measure of reproductive potential" 660.310(e)(2)(ii)(B).

The HMS FMP defines a default MSST as no less than half of  $B_{MSY}$  (when natural mortality exceeds 0.5). If natural mortality is equal to or greater than 0.5 then the MSST would vary between  $0.5B_{MSY}$  and  $0.75B_{MSY}$  based on the calculation  $(1-M)B_{MSY}$ . For vulnerable species the HMS FMP currently suggests a precautionary adjustment from the default value used to calculate the MSST; it would be set generally closer to  $B_{MSY}$  than under the default calculation. No change is proposed in the method for determining the MSST, except that the FMP will more clearly specify how the calculation would be made for vulnerable species.

The Guidelines at 600.310(k) describe the required Council response to a Secretarial determination of international overfishing. The FMP will be amended to reference and summarize these requirements.

### 2.5.2.3 Optimum Yield

OY is defined in the MSA. The Guidelines state "The determination of OY is a decisional mechanism for resolving the MSA's conservation and management objectives, achieving a fishery management plan's (FMP) objectives, and balancing the various interests that comprise the greatest overall benefits to the Nation" 600.310(b)(2)(ii). OY is based on MSY as reduced by factors outlined in Section (e)(3) of the Guidelines. OY is expressed as an "amount of fish"; in other words it is a quantity rather than a rate.

The HMS FMP describes an OY control rule. For species not considered vulnerable the OY or OY proxy is set equal to MSY. For vulnerable species the OY or OY proxy is set at  $0.75MSY$ .

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Under the proposed amendment the FMP would be revised to describe a more flexible framework for setting OYs that addresses life history concerns, management goals, and socioeconomic considerations on a species-by-species basis. The description of the framework would be based on the criteria enumerated in the following sections in the Guidelines: (e)(3)(iv), factors to consider in OY specification, and (e)(3)(iii), determining the greatest benefit to the Nation. As in the FMP currently, the framework would relate OY to SDCs, such that OY control rules are consistent with the objectives of preventing overfishing and rebuilding overfished stocks. For stocks where a local MSY is identified (Category 3 above), the OY (and SDCs) would be for the portion of the stock for which local MSY is determined.

### **2.5.3 Reference Points for Managed Species not Subject to the International Exception**

In addition to the reference points outlined above, for those species not subject to international exception (potentially, shortfin mako and common thresher shark) the allowable biological catch and ACL must be established. The Guidelines also identify the annual catch target (ACT) as an optional AM. ACTs are intended to account for management uncertainty.

To implement any ABCs, ACLs, ACTs, and AMs that may be necessary the biennial process described in Chapter 5 of the HMS FMP will be used. This chapter would be revised to incorporate these additional requirements.

#### 2.5.3.1 Allowable Biological Catch

ABC is a new concept in the revised Guidelines. According to the Guidelines, “ABC is a level of a stock or stock complex’s catch that accounts for the scientific uncertainty in the estimate of OFL and any other scientific uncertainty . . . , and should be specified based on the ABC control rule” 310(f)(2)(ii). The ABC control rule is a “specified approach” for setting the ABC. Catch is measured in weight or numbers of fish and is assessed from all sources (commercial, recreational, subsistence, tribal, and other fisheries). The SSC must recommend the ABC to the Council and the ABC may not exceed the OFL.

Because this is a new concept, the HMS FMP currently contains no definition or discussion of ABC. Under this amendment the FMP would be revised to describe the processes for specifying ABC control rules and ABCs. The HMSMT would define the ABC control rule, which would then be reviewed by the SSC and adopted by the Council.<sup>1</sup>

Generally, the ABC control rule should be consistent with the OY control rule, because the OY should not be greater than the ABC. For stocks where a local MSY is identified (Category 3 above), the ABC would be for the portion of the stock for which local MSY is determined.

The Guidelines suggest a stochastic approach to setting ABC: “The determination of ABC should be based, when possible, on the probability that an actual catch equal to the stock’s ABC would result in overfishing. This probability that overfishing will occur cannot exceed 50 percent and should be a lower value” 660.310(f)(4). The Groundfish and CPS Subcommittees of the SSC have developed a methodology that relates the probability of overfishing to a corresponding reduction from the OFL to set the ABC (SSC 2009), often referred to as “P star” (P\*) after the symbol used to denote the probability that overfishing will occur. This methodology could be combined with DCAC or DB-SRA methods to

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<sup>1</sup> The Guidelines state “each Council must establish an ABC control rule based on scientific advice from the SSC” 600.310(f)(4).

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determine the ABCs for the two shark stocks (since they are likely to fall into Category 3 in terms of data availability).

### 2.5.3.2 Annual Catch Limit

According to the Guidelines, an ACL is “the level of annual catch of a stock or stock complex that serves as the basis for invoking AMs [accountability measures]” 660.310(f)(2)(iv). The ACL cannot exceed the ABC and may be set annually or on a multiyear plan basis, 660.310(f)(5)(i). The Guidelines are silent on what considerations would prompt setting the ACL to a level below the ABC. Presumably, considerations equivalent to those used for setting the OY could factor into setting an ACL below the ABC. The ACL would normally not be set greater than the OY.<sup>2</sup> Therefore, if the OY is set below the ABC, it is likely that the ACL should also be set at that lower level.

As necessary, a further reduction from the ABC to set the ACL could be applied to account for management uncertainty. In general, the current discussion of OY in the FMP, which recommends OY = 0.75 MSY for vulnerable species, serves a similar purpose. In this respect, as a general rule an ACL could be set at 75 percent of the OFL when setting ACLs, which are only considered for the two vulnerable shark species under the international exception options.

## 2.6 Accountability Measures

AMs are management controls to prevent ACLs from being exceeded and to respond to a situation where an ACL has been exceeded. Section g in the Guidelines describes the features of AMs. Inseason AMs include monitoring and management measures to prevent catch from exceeding ACLs, and may include ACTs. If an ACL is exceeded more than once every four years then the system of ACLs and AMs should be re-evaluated and modified as necessary.

Chapter 5 in the HMS FMP describes a framework for the periodic specification of quotas, harvest guidelines, and an array of management measures. In Section 6.1.7, describing quotas and harvest guidelines, the FMP authorizes the following procedure:

The HMS Management Team, at its annual meeting in May or June, will review the catches from the previous statistical year (April 1-March 31) and compare those catches with the established harvest guidelines; evaluate the status of the stocks; and develop recommendations for management measures, as appropriate. These management measures will be presented to the Council as part of the SAFE document at its June and/or September meetings to be reviewed and approved for public review. Final action on management measures would be scheduled for the Council’s November meeting.<sup>3</sup>

The specification process operates on a 2-year, or biennial, schedule. The fishing year is defined as April 1-March 31 and the current biennial period ends on March 31, 2011. The Council has considered implementation or adjustment of management measures for two biennial periods since implementation of the HMS FMP (2007-2009 and 2009-2011). For the first cycle the Council adopted new recreational

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<sup>2</sup> An exception might be for a stock where MSY (rather than a proxy) can be specified and current stock biomass is well in excess of  $B_{MSY}$ . Since OY is a long-term average amount of desired yield, it could be set consistent with long-term MSY while in the short term the ACL could be set higher so that stock biomass declines to  $B_{MSY}$ . However, given current rates of exploitation of almost all fish stocks, it is unlikely that such a situation would arise.

<sup>3</sup> Although this paragraph uses the term “management measures,” given the context it may be assumed that the specific reference would be to quotas or harvest guidelines.

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bag limits for albacore tuna and modified vessel marking requirements for commercial passenger fishing vessel (CPFV) vessels. For the second cycle the Council considered measures to constrain the recreational catch of common thresher shark (time/area closures, bag limits) but ultimately did not recommend new regulatory measures.

This framework provides flexibility to respond to changing conditions in fisheries. It is very similar to the specifications framework authorized by the Groundfish FMP. As part of the biennial process, routine management measures can be identified. These can be implemented or modified inseason through a single Council meeting and one Federal Register notice (“notice actions”) or two Council meetings and one Federal Register notice (“abbreviated rulemaking”). To date the Council has not done any inseason management under the HMS FMP, because no pressing resource conservation issues have arisen that can be dealt with unilaterally (without international action).

This framework is readily adaptable to the requirements of the Guidelines. Therefore, no new AMs are proposed under this amendment. However, the FMP would be revised to explain how the existing AMs are related to any ACLs that may be established. Added language in the FMP will explain their function in preventing an ACL from being exceeded or addressing situations where post-season accounting shows an ACL has been exceeded.

If ACLs were established for any MUS, perhaps the more pressing issue would be whether current catch monitoring systems are sufficient to ensure that an ACL would not be exceeded. Specifically, if the ACL is developed as a limit on total removals (catch and dead discards) then appropriate monitoring of bycatch would need to be ensured. Some components of the recreational fishery may be poorly monitored. For some species many fishermen practice catch-and-release, and post-release mortality rates are not well estimated.<sup>4</sup> Finally, data availability and analysis of total removals would need to be timely if inseason measures are needed to prevent an ACL from being exceeded.

## 2.7 Proposed Alternatives

In this section, the range of issues outlined above, some presented with different options, are organized into a set of alternatives. Each alternative represents a complete package of measures to amend the HMS FMP to comply with the Guidelines. Table 2-5 provides a comparative summary of the alternatives described below.

### 2.7.1 *Alternative 1: No Action*

Under the No Action the HMS FMP would not be amended.

**Classification of Stocks in the FMP:** Currently there are 13 MUS and 34 monitored species listed in Chapter 3 of the HMS FMP. Section 2.2.1 describes the criteria that were used to select which species would be included in these categories.

**Applying the International Exception:** When the FMP was implemented, the Guidelines did not contain provisions for ACLs or the exception at 660.310((h)(2)(ii) for setting ABCs and ACLs.

**Determining the Primary FMP:** When the FMP was implemented, the Guidelines did not contain language at 660.310(d)(7) stating that for stocks or species appearing in more than one FMP, councils should choose which FMP will be the primary FMP.

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<sup>4</sup> NMFS SWFSC has been conducting ongoing research to improve estimates of post-release mortality for recreationally caught sharks.

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**Process for Revising Numerical Estimates of MSY, OY and SDC:** Currently the FMP does not specify a process for revising numerical estimates of these quantities. When adopted, the FMP included a table (Table 4-3 in the amended FMP) providing numerical estimates of MSY and OY.

**Method for Determining Reference Points, ACLs, and Accountability Measures:** Chapter 4 in the HMS FMP identifies MSY for managed species and describes methods for determining SDCs and OYs. The FMP does not discuss or specify ABCs or ACLs for any managed species, because at the time of implementation the Guidelines did not contain these provisions. Chapters 5 and 6 describe the framework for the periodic specification of management measures and management measures in place at the time of FMP implementation. Regulations pursuant to the HMS FMP are found at 50 CFR 660 Subpart K.

### **2.7.2 Alternative 2**

**Classification of Stocks in the FMP:** The current 13 MUS would remain as listed. All 34 listed monitored species would be reclassified as EC species.

**Applying the International Exception:** The international exception to setting ABCs and ACLs described at 660.310(h)(2)(ii) would be applied to all managed species.

**Determining the Primary FMP:** The HMS FMP will be amended to discuss the process by which the determination of the primary FMP will be made in consultation with the WPFMC. The determination will be based on the stock, or portion of the stock (if stock structure is poorly understood and catch data is limited), for which reference points will be identified.

**Process for Revising Numerical Estimates of MSY, OY and SDC:** The process described under Option 1 in Section 2.5.1 will be used under this alternative.

**Method for Determining Reference Points, ACLs, and Accountability Measures:** Section 2.5.2 describes how methods for determining MSY, OY, and SDC would be specified in the FMP under the proposed action. MUS will be assigned to one of three categories based on how much information is available for estimating an MSY or MSY proxy. The FMP will be amended to more clearly describe the methods for determining SDCs. If an RFMO has adopted reference points for an HMS FMP-managed stock, that reference point will be reported, after SSC review. The FMP would be revised to describe a more flexible framework for setting OYs that addresses life history concerns, management goals, and socioeconomic considerations on a species-by-species basis consistent with the criteria enumerated in the Guidelines. Although all species would be excepted from the ABC/ACL requirement under this alternative, language would be added describing these reference points and the process for determining them in the event that at a later date the Council chooses to set an ACL for one or more managed species. Language will be added to the FMP referencing Section 600.310(k) in the Guidelines on Council response to a Secretarial determination of international overfishing. Since the international exception is applied to all stocks, ABCs and ACLs would not be identified. The current processes and measures described in Chapters 5 and 6 of the FMP would be used to address the Guidelines' discussion of AMs. Chapter 4 would be amended to reference and summarize relevant sections of the Guidelines.

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## **2.7.3 Alternative 3**

**Classification of Stocks in the FMP:** Opah would be added to the current list of 13 MUS for a total of 14 MUS. Monitored species that the HMSMT has determined have very low susceptibility to west coast fisheries would be dropped so that 11 EC species are identified in the HMS FMP.

**Applying the International Exception:** The international exception to setting ABCs and ACLs described at 660.310(h)(2)(ii) would be applied to all managed species except for common thresher and shortfin mako shark.

**Determining the Primary FMP:** Same as Alternative 2.

**Process for Revising Numerical Estimates of MSY, OY and SDC:** The process described under Option 1 in Section 2.5 will be used under this alternative.

**Method for Determining Reference Points, ACLs, and Accountability Measures:** For MSY, SDCs, and OY the FMP would be amended in the same manner as under Alternative 2. Additional language would be added to the FMP stating that ABCs and ACLs would be set for common thresher and shortfin mako shark. The current processes and measures described in Chapters 5 and 6 of the FMP would be used to address the Guidelines' discussion of AMs. Chapter 4 would be amended to reference and summarize relevant sections of the Guidelines.

## **2.7.4 Alternative 4**

**Classification of Stocks in the FMP:** Opah would be added to the current list of 13 MUS while pelagic and bigeye thresher shark would be reclassified as EC species, leaving a total of 12 MUS in the FMP. Monitored species that the HMSMT has determined have very low susceptibility to west coast fisheries would be dropped so that 13 EC species are identified in the HMS FMP.

**Applying the International Exception:** The international exception to setting ABCs and ACLs described at 660.310(h)(2)(ii) would be applied to all managed species except for common thresher shark.

**Determining the Primary FMP:** Same as Alternative 2.

**Process for Revising Numerical Estimates of MSY, OY and SDC:** The process described under Option 1 in Section 2.5 will be used under this alternative.

**Methods for Determining Reference Points, ACLs, and Accountability Measures:** For MSY, SDCs, and OY the FMP would be amended in the same manner as under Alternative 2. Additional language would be added to the FMP describing the process and methods for setting ABCs and ACLs for common thresher shark. The current processes and measures described in Chapters 5 and 6 of the FMP would be used to address the Guidelines' discussion of AMs. Chapter 4 would be amended to reference and summarize relevant sections of the Guidelines.

## **2.7.5 Alternative 5 (Council-preferred)**

**Classification of Stocks in the FMP:** Bigeye thresher and pelagic thresher would be reclassified as EC species resulting in a total of 11 MUS. Based on these considerations there would be eight EC species

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included in the FMP, including the two shark species that are currently MUS. Table 2-6 shows the MUS and EC species under the alternatives including the preferred alternative.

**Applying the International Exception:** The international exception to setting ABCs and ACLs described at 660.310((h)(2)(ii)) would be applied to all managed species.

**Determining the Primary FMP:** As with the other action alternatives, the HMS FMP will be amended to discuss the process by which the determination of the primary FMP will be made in consultation with the WPFMC. The determination will be based on the stock, or portion of the stock (if stock structure is poorly understood and catch data is limited), for which reference points will be identified.

**Process for Revising Numerical Estimates of MSY, OY and SDC:** The process described under Option 2 in Section 2.5 will be used under this alternative.

**Methods for Determining MSY, OY, and SDC including OFL:** Methods for determining these reference points would be the same as under the other action alternatives, and as described in Section 2.5.2. ABCs and ACLs would not need to be established since all MUS are subject to the international exception under this alternative.

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**Table 2-5. Summary of alternatives.**

Issue	Alternative 1 (No Action)	Alternative 2	Alternative 3	Alternative 4	Alternative 5 (Council Preferred)
<b>Classification of stocks</b>	13 MUS 34 monitored species	13 MUS 34 EC species	14 MUS (add Opah) 11 EC species (drop selected)	12 MUS (bigeye and pelagic thresher to EC, add opah) 13 EC species (drop selected, move as above)	11 MUS (bigeye and pelagic thresher to EC) 8 EC species (drop selected, move as above)
<b>Application of the international exception</b>	Not applied	Applied to all stocks	Applied to all stocks except common thresher and shortfin mako	Applied to all stocks except common thresher	Applied to all stocks
<b>Primary FMP designation</b>	No designations	Designation at stock level in consultation with WPFMC; flexibility to change based on new information	Designation at stock level in consultation with WPFMC; flexibility to change based on new information	Designation at stock level in consultation with WPFMC; flexibility to change based on new information	Designation at stock level in consultation with WPFMC; flexibility to change based on new information
<b>Adoption of adjustments to estimates of MSY and OY</b>	<ul style="list-style-type: none"> <li>No process identified for adjusting numerical estimates of MSY and OY</li> <li>MSY and OY estimates included in FMP as of original adoption</li> </ul>	<ul style="list-style-type: none"> <li>Numerical estimates of MSY, SDCs and OYs reported in SAFE</li> <li>MSY and OY estimates included in the FMP at the time of implementation deleted</li> </ul>	<ul style="list-style-type: none"> <li>Same as alternative 2</li> </ul>	<ul style="list-style-type: none"> <li>Same as alternative 2</li> </ul>	<ul style="list-style-type: none"> <li>MSY, OY, and SDC reported in SAFE</li> <li>Council submits recommendation on adjustment to MSY/OY to NMFS for review</li> <li>MSY and OY estimates included in the FMP at the time of implementation retained</li> </ul>
<b>Specification of MSY and SDC</b>	<ul style="list-style-type: none"> <li>MSY or MSY proxies listed in FMP</li> <li>Methods for determining MFMT and MSST identified</li> </ul>	MSY or MSY proxies estimated using methods consistent with data availability category			
<b>Specification of OYs</b>	Default and alternative OY control rules described	Flexible framework to determine OY on stock basis based on criteria in Guidelines			
<b>Specification of ABCs</b>	Not specified	Not Specified	Specified for common thresher and shortfin mako	Specified for common thresher	Not Specified
<b>Specification of ACLs</b>	Not specified	Not Specified	Specified for common thresher and shortfin mako	Specified for common thresher	Not Specified
<b>Accountability measures</b>	Chapters 5 & 6 outline management measures and process for periodic adjustment	Not necessary	Measures and processes as described in Chapters 5 & 6 of the FMP	Measures and processes as described in Chapters 5 & 6 of the FMP	Not necessary but measures and processes as described in Chapters 5 & 6 of the FMP could be used if the Council chose to adopt an optional ACL despite international exception

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**Table 2-6. Managed and EC species under the action alternatives.**

Alternative 2	Alternative 3	Alternative 4	Alternative 5 (Council-preferred)
<b>Management Unit Species</b>			
1. Albacore tuna, <i>Thunnus alalunga</i>			
2. Bigeye tuna, <i>T. obesus</i>			
3. Skipjack tuna, <i>Katsuwonus pelamis</i>			
4. Bluefin tuna, <i>T. orientalis</i>			
5. Yellowfin tuna, <i>T. albacares</i>			
6. Striped marlin, <i>Tetrapturus audax</i>			
7. Swordfish, <i>Xiphias gladius</i>			
8. Bigeye thresher shark, <i>Alopias superciliosus</i>	8. Bigeye thresher shark, <i>Alopias superciliosus</i>	8. Blue shark, <i>Prionace glauca</i>	8. Blue shark, <i>Prionace glauca</i>
9. Blue shark, <i>Prionace glauca</i>	9. Blue shark, <i>Prionace glauca</i>	9. Common thresher shark, <i>A. vulpinus</i>	9. Common thresher shark, <i>A. vulpinus</i>
10. Common thresher shark, <i>A. vulpinus</i>	10. Common thresher shark, <i>A. vulpinus</i>	10. Shortfin mako shark, <i>Isurus oxyrinchus</i>	10. Shortfin mako shark, <i>Isurus oxyrinchus</i>
11. Pelagic thresher shark, <i>A. pelagicus</i>	11. Pelagic thresher shark, <i>A. pelagicus</i>	11. Dorado (dolphin), <i>Coryphaena hippurus</i>	11. Dorado (dolphin), <i>Coryphaena hippurus</i>
12. Shortfin mako shark, <i>Isurus oxyrinchus</i>	12. Shortfin mako shark, <i>Isurus oxyrinchus</i>	12. Opah, <i>Lampris guttatus</i>	
13. Dorado (dolphin), <i>Coryphaena hippurus</i>	13. Dorado (dolphin), <i>Coryphaena hippurus</i>		
	14. Opah, <i>Lampris guttatus</i>		
<b>Ecosystem Component Species</b>			
1. Bat ray, <i>Myliobatis californica</i>	1. Black skipack, <i>Euthynnus lineatus</i>	1. Bigeye thresher shark, <i>Alopias superciliosus</i>	1. Bigeye thresher shark, <i>Alopias superciliosus</i>
2. Black marlin, <i>Makaira indica</i>	2. Bullet mackerel (tuna), <i>Auxis rochei</i>	2. Black skipack, <i>Euthynnus lineatus</i>	2. Common mola, <i>Mola mola</i>
3. Blacktip shark, <i>Carcharhinus limbatus</i>	3. Common mola, <i>Mola mola</i>	3. Bullet mackerel (tuna), <i>Auxis rochei</i>	3. Escolar, <i>Lepidocybium flavobrunneum</i>
4. Blue marlin, <i>Makaira nigricans</i>	4. Escolar, <i>Lepidocybium flavobrunneum</i>	4. Common mola, <i>Mola mola</i>	4. Lancetfishes, Alepisauridae
5. Bullet mackerel (tuna), <i>Auxis rochei</i>	5. Hammerhead sharks, Sphyrnidae	5. Escolar, <i>Lepidocybium flavobrunneum</i>	5. Louvar, <i>Luvarus imperialis</i>
6. Common mola, <i>Mola mola</i>	6. Louvar, <i>Luvarus imperialis</i>	6. Hammerhead sharks, Sphyrnidae	6. Pelagic stingray, <i>Pteroplatytrygon violacea</i>
7. Dusky shark, <i>C. obscurus</i>	7. Oilfish, <i>Ruvettus pretiosus</i>	7. Louvar, <i>Luvarus imperialis</i>	7. Pelagic thresher shark, <i>Alopias pelagicus</i>
8. Escolar, <i>Lepidocybium flavobrunneum</i>	8. Pacific bonito, <i>Sarda chiliensis</i>	8. Oilfish, <i>Ruvettus pretiosus</i>	8. Wahoo, <i>Aathocybium solandri</i>
9. Hammerhead sharks, Sphyrnidae	9. Pacific pomfret, <i>Brama japonica</i>	9. Pacific bonito, <i>Sarda chiliensis</i>	
10. Lancetfishes, Alepisauridae	10. Pelagic stingray, <i>Pteroplatytrygon violacea</i>	10. Pacific pomfret, <i>Brama japonica</i>	
11. Leopard shark, <i>Triakis semifasciata</i>	11. Wahoo, <i>Aathocybium solandri</i>	11. Pelagic stingray, <i>Pteroplatytrygon violacea</i>	
12. Louvar, <i>Luvarus imperialis</i>		12. Pelagic thresher shark, <i>Alopias pelagicus</i>	
13. Manta/Mobula rays, Mobulidae		13. Wahoo, <i>Aathocybium solandri</i>	
14. Oarfish, <i>Regalecus glesne</i>			
15. Oceanic whitetip shark, <i>C. longimanus</i>			
16. Oilfish, <i>Ruvettus pretiosus</i>			
17. Opah, <i>Lampris guttatus</i>			

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## Alternative 2

## Alternative 3

## Alternative 4

## Alternative 5 (Council-preferred)

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18. Pacific bonito, *Sarda chiliensis*
  19. Pacific moonfish, *Selene peruviana*
  20. Pacific pomfret, *Brama japonica*
  21. Pacific sailfish, *Istiophorus platypterus*
  22. Pacific saury, *Cololabis saira*
  23. Pelagic stingray, *Pteroplatytrygon violacea*
  24. Prickly shark, *Echinorhinus cookei*
  25. Rainbow runner, *Elagatis bipinnulata*
  26. Salmon shark, *Lamna ditropis*
  27. Shortbill spearfish, *Tetrapturus angustirostris*
  28. Silky shark, *C. falciformis*
  29. Six gill shark, *Hexanchus riseus*
  30. Soupfin shark, *Galeorhinus galeus*
  31. Spiny dogfish, *Squalus acanthias*
  32. Wahoo, *Acanthocybium solandri*
  33. Whale shark, *Rincodon typus*
  34. Bat ray, *Myliobatis californica*

## 2.8 Alternatives Considered but Rejected from Further Analysis

In November 2009 the Council considered an alternative under which the international exception would only be applied to the managed tunas and billfish in the HMS FMP and not to the four shark species and dorado.

## 2.9 Comparison of the Alternatives

This section describes how the management framework described in the HMS FMP would function under the different alternatives in relation to the provisions contained in the revised NS1 Guidelines. The next section describes the current management framework, or the No Action Alternative. The action alternatives (Alternatives 2-5) are then described in Section 2.9.1.2, pointing out the key differences among the alternatives.

### 2.9.1.1 Alternative 1 (No Action)

#### **Preventing Overfishing, Rebuilding Overfished Stocks, and Achieving Optimum Yield**

The current framework for determining reference points, including MSY and SDC, and OY is described in Chapter 4 of the FMP and represents the No Action Alternative (Alternative 1). FMP Chapter 4 contains a discussion of reference points in terms of control rules for management. FMP Table 4-2 provides estimates of whether overfishing is occurring or the stock is overfished for HMS MUS. A facsimile of this table has been reproduced in the Annual HMS SAFE Report (Table 5-2) presenting updated estimates based on current stock assessments, if available. Table 4-3 in the FMP presents estimates of MSY and OY (or proxies) for HMS MUS. For tunas, swordfish, and dorado the OY (or proxy) is set equal to MSY while for striped marlin and the sharks the 25 percent reduction for vulnerable species is applied to determine the OY. However, the FMP does not describe any process for updating these estimates based on new information.

The FMP implemented harvest guidelines for two shark species, common thresher (340 mt) and shortfin mako (150 mt), equal to the OY. In 2008, as part of the biennial management measures process, the HMSMT undertook a comprehensive evaluation of catch data for common thresher to determine whether there was a risk of the harvest guideline being exceeded. This evaluation was prompted by concern that recreational fisheries, primarily in the Southern California Bight (SCB), were catching large numbers of this species. This evaluation indicated that catch was still below the harvest guideline and the Council concluded that no additional recreational management measures were necessary. A similar comprehensive evaluation of catch data for shortfin mako, to determine current catch in relation to the harvest guideline, has not yet been conducted. Commercial landings ranged from 33 to 54 mt 2004-2008; a comparable estimate of recreational mortality is not available, but does not likely exceed commercial landings, suggesting that total catch does not exceed the harvest guideline. The FMP management framework (Chapter 5 in the FMP) allows for modification of quotas or harvest guidelines as part of the biennial process, including establishing them for other MUS. Thus, if catch by west coast fisheries raises a conservation concern that can be addressed by limiting catch, this could be addressed through the biennial process.

The FMP framework allows for determination of whether overfishing is occurring in those cases where this is enough information to estimate SDC.<sup>5</sup> However, in relation to management actions to respond to

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<sup>5</sup> The 2010 SAFE Table 5-2 lists overfishing status as unknown for albacore tuna, bluefin tuna, striped marlin, SEPO swordfish, pelagic thresher, bigeye thresher, and dorado. For assessed species (tunas and swordfish)

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such determinations, west coast fisheries account for a very small proportion of stockwide fishing mortality for most HMS MUS (see Chapter 3). For that reason, Section 2.3.1 in the FMP emphasizes that unilateral action to reduce catch by west coast fisheries is unlikely to be effective. Possible exceptions include circumstances where a significant portion of the regional distribution of the stock is subject to harvest by west coast fisheries, a protected species is affected, or other domestic issues (e.g., local depletion, EFH impacts) come into play. The FMP also discusses the need to unilaterally respond in cases where overfishing is occurring, consistent with MSA Section 304(e). However, this discussion is dated due to the addition of Section 304(i) by the MSRA, which addresses international overfishing. According to Section 304(i), if overfishing is due to “excessive international fishing pressure” the Council makes recommendations for regulations to address the “relative impact” of U.S. fishing vessels and actions at the international level (e.g., through RFMO processes) to end overfishing and rebuild stocks.

Since implementation of the HMS FMP in 2004 two HMS MUS have been subject to an overfishing declaration (see Chapter 3), bigeye tuna in 2004 and yellowfin tuna in 2006. For bigeye the Council responded consistent with MSA Section 304(e) since this was before the MSRA changes, and added Section 4.5 to the HMS FMP describing recommendations to the WCPFC and IATTC for U.S. delegations to carry forward. For yellowfin tuna, the Council followed the procedures outlined in Section 304(i). The Council found that additional management measures for fisheries managed under the HMS FMP were unnecessary to address the relative impact of those fisheries and submitted a report to Congress and the Department of State on measures the U.S. should pursue through RFMO processes.

The information presented above indicates that for most, if not all, of the HMS MUS the Council is severely limited in their ability to propose measures to end overfishing and rebuild stocks, because overfishing is primarily a function of fishing by foreign (nonwest coast) fleets. The Council implemented harvest guidelines for common thresher and shortfin mako sharks, because of their low biological resilience and relatively high susceptibility to west coast fisheries. Stock structure is not well understood for these two species. The common thresher shark stock appears to be confined to coastal areas with a single, shared stock between U.S. west coast and Mexican waters. Bigeye thresher shark appears to have a wider range, based on the tag recovery data presented in Chapter 3, but there still may be a risk of local depletion. The biennial management process can be used to evaluate catches relative to targets or limits (e.g., a harvest guideline based on proxy reference points) and implement additional management controls if needed.

OY is defined in terms of the biological characteristics of the stock (it is based on MSY) and policy considerations related to providing the “greatest overall benefit to the Nation.” In the FMP MSY and OY estimates are derived from stock assessments or stock-wide catch time series for all MUS except for common thresher and shortfin mako. For the two shark species a local MSY (LMSY) is estimated based on west coast catches. Stock-wide MSY/OY estimates imply that the “greatest overall benefit to the Nation” results from effective management internationally, since most fishing mortality is attributable to foreign fleets. (The Nation may benefit indirectly from well-managed foreign fishing, for example through imports of fish products.) Some of these MSY/OY estimates in the FMP may no longer be based on the best scientific information available, especially in cases where more recent stock assessments have produced different estimates of MSY. However, the fact that the FMP estimates may be dated has little practical effect, because the Council bases its recommendations for management on the current stock assessments, if available.

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this is due to the lack of generally accepted reference points. For unassessed species (sharks and dorado) this is due to the lack of information on basic stock parameters.

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## **Accounting for Scientific and Management Uncertainty**

Under the current management framework OFL, ABC, and ACL reference points are not defined and the HMS FMP does not contain a discussion of accounting for scientific uncertainty when considering catch controls. Although scientific uncertainty was not to be explicitly accounted for, the harvest guidelines are set based on a 25 percent reduction from the LMSY proxy estimate, because of the vulnerability of the stocks in question. More generally, the FMP discusses precautionary reductions from MSY to set OYs and states that harvest guidelines will be set equal to the OY. Consideration of scientific uncertainty would not be precluded in any future consideration of adopting or adjusting harvest guidelines.

## **Biennial Management Process**

Section 2.6 describes current (No Action) accountability mechanisms, which consist of various programs to document commercial landings (PacFIN), commercial catch (observer programs), and recreational catch (RecFIN), and the biennial process for applying and adjusting management measures. The Council is also engaged in international processes through U.S. delegations to RFMOs. The Pacific, Western Pacific, and North Pacific Councils recently signed a memorandum of understanding with the Department of Commerce (NMFS) and Department of State clarifying Council participation in U.S. RFMO delegations and related activities. The HMS FMP establishes a management framework under which the Council evaluates new information, presented in the HMS SAFE document, and considers the development of new management measures as necessary in response to new information. Recommended regulatory changes are submitted to NMFS for review and implementation.

## **Reclassification of Stocks in the FMP**

Under No Action no EC species are designated. However, the HMS FMP contains a “monitored species” category that is very similar in purpose to the EC category. The HMS FMP identifies 34 monitored species (Table 2-6) based on three criteria (see Section 2.2.1). Although this is a comprehensive list, the need for ongoing tracking of all these species is questionable and may not be practicable. In terms of necessity, many of these species are infrequently caught in HMS fisheries. This is due, first, because some HMS fisheries—albacore troll, harpoon, purse seine, recreational—have low bycatch rates. Second, many are tropical or subtropical species that may have been encountered in commercial fisheries that were more extensive during FMP development but are now likely very infrequently or never encountered. At the time of FMP development, for example, there was a larger pelagic longline fishery operating from the west coast but fishing outside the EEZ, principally targeting swordfish. That fishery was closed pursuant to FMP implementation due to an ESA jeopardy determination and subsequent implementing regulations. Chapter 3 reviews available information on commercial landings, recreational catch, and observed catch in the DGN fishery.

Because of the large number of species included in this monitored category the HMSMT heretofore has not regularly engaged in a comprehensive evaluation of incidental catch of these species in relation to potential conservation concerns. The HMS FMP currently states these species “should be monitored on a consistent and routine basis to the extent practicable” (Section 3.2) and the annual SAFE report will provide the basis for documenting significant trends or changes in bycatch (Section 4.3). To date the annual SAFE reports have provided summarized observer data for the DGN fishery but the SAFE documents have not presented any detailed analysis of whether bycatch rates have changed.

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### 2.9.1.2 Alternatives 2-5 (Action Alternatives Including the Council-preferred Alternative)

#### **Preventing Overfishing, Rebuilding Overfished Stocks, and Achieving Optimum Yield**

With respect to management reference points (MSY, OY, SDC, ABC, and ACL) and AMs, all of the action alternatives vary from No Action in the following ways:

- Including definitions of management reference points in the FMP consistent with NSI Guidelines
- Specifically referencing the OFL as an alternative fishing mortality threshold
- Describing three categories for methods to determine MSY, based on information availability
- Allowing consideration of setting OY on a case-by-case basis for vulnerable species, starting from the default calculation  $OY = 0.75MSY$
- Including a description of ABC, ACL, and ACT in the FMP, based on NSI Guidelines, and allowing for the Council setting ACLs (and ACTs) even if not required by the Guidelines because of the exceptions at 50 CFR 600.310(h)
- Adding discussion of the application of MSA Section 304(i) with respect to international overfishing
- Directing that the HMS SAFE document report any changes to the numerical estimates of MSY and OY adopted by the Council

The action alternatives differ in the following respects with respect to reference points:

- ABCs and ACLs required for common thresher shark (Alternatives 3 and 4) and shortfin mako shark (Alternative 3), i.e., international exception not applied to these stocks
- Removing numerical estimates of MSY and OY from the FMP (Alternatives 2-4)
- Changes to the numerical estimates of MSY and OY adopted by the Council through the biennial management process as a recommendation to NMFS, which then reviews; approved estimates reported in the next SAFE as above (Alternative 5, Preferred Alternative)

The effects of the action alternatives may be attributed to three components: establishing a framework process whereby the Council may adjust numerical estimates of MSY and OY (and by extension SDC), the Council response to overfishing, and requiring setting ACLs for shortfin mako and/or common thresher.

#### Establishing and Adjusting MSY, OY, and SDC

Adjusting estimates of MSY and OY in response to new information will have limited practical effect for those stocks where west coast fisheries' contribution to fishing mortality is negligible, because any Council-initiated control of fishing mortality would not likely materially affect stock status (Table 2-7 reproduces information from the HMS SAFE on west coast catch of HMS MUS as a fraction of stockwide catch). For species where RFMOs have established conservation measures that explicitly attempt to control fishing mortality (tunas and billfish) the Council could play an ancillary role of evaluating how RFMOs are responding to stock status by independently considering estimates of MSY and SDC, and in response provide input to U.S. delegations.

In this regard, the key difference between Alternatives 2-4 and Alternative 5 (the Preferred Alternative) is that under the Preferred Alternative NMFS has a review role on Council recommendations on MSY/OY estimates. This is consistent with the requirements of the MSA, while simply publishing these estimates in the SAFE may not be legally compliant. Such review also allows full consideration of the national interest. In addition, the Preferred Alternative more explicitly identifies the biennial

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process for Council consideration of these adjustments, which may facilitate public participation in decision-making.

**Table 2-7. Stockwide and regional catches for HMS management unit species (x1,000 mt round weight), 2004–08.**

Species (stock)	Stockwide Catch	U.S. West Coast Catch		Average Annual Fractional Catch
		Commercial	Recreational	
<u>TUNAS</u>				
Albacore (NPO)	63-93 <sup>1</sup>	9–15	0.2–1.6	0.17
Bluefin (NPO)	20-27 <sup>1</sup>	<0.21	0.01–0.1	<0.01
Bigeye (EPO)	93–118 <sup>2</sup>	<0.04	<0.01	<0.01
Skipjack (EPO)	201–299 <sup>2</sup>	<0.53	<0.02	<0.01
Yellowfin (EPO)	177–291 <sup>2</sup>	0.07-0.5	0.1–0.34	<0.01
<u>BILLFISHES</u>				
Striped Marlin (EPO)	0.35–1.5 <sup>2</sup>	<0.01 <sup>3</sup>	<0.03 <sup>4</sup>	0.02
Swordfish (EPO)	2.1-15.7 <sup>2</sup>	0.3–1.2	<0.01	0.09
<u>SHARKS</u>				
Common Thresher	Unknown	0.1–0.2	0.01–0.13	
Pelagic Thresher	Unknown	<0.01		
Bigeye Thresher	Unknown	≤0.01		
Shortfin Mako	Unknown	0.03–0.06	0.02–0.13	
Blue (NPO)	Unknown	<0.04 <sup>3</sup>	<0.01	
<u>OTHER</u>				
Dorado	4–15.7 <sup>2</sup>	<0.01	0.03–0.26	0.014

**Notes:**

Data for U.S. West Coast catch are from updated commercial, CPFV and private recreational catches with weight conversions of 8.7 kg/albacore, 8.7 kg/bluefin, 10.0 kg/bigeye tuna, 3.0 kg/skipjack, 4.9 kg/yellowfin, 57.9 kg/striped marlin, 113 kg/swordfish, 29.2 kg/common thresher, 16.8 kg/mako, 8 kg/blue shark, and 5.6 kg/dorado.

<sup>1</sup> International Scientific Committee Tenth Plenary Report Catch Tables, July 2010.

<sup>2</sup> IATTC catch tables extracted 8/15/10.

<sup>3</sup> Striped marlin and blue shark commercial catches include estimates from the drift gillnet observed catch.

<sup>4</sup> Striped marlin recreational catch is estimated at 300 fish/year based on club records plus CPFV logbook recorded catch.

### Responding to Overfishing

The action alternatives also amend the FMP to clarify the Council’s response to international overfishing. Because the Council must comply with applicable law, these changes have little practical effect on how the Council responds to overfishing declarations. Prior to implementation of the MSRA the Council responded to an overfishing declaration on the Pacific-wide bigeye tuna stock by amending the HMS FMP (as required by Section 304(e));<sup>6</sup> however, the amendment contains recommendations for measures to end overfishing at the international level only, because the relative impact of west coast fisheries on this stock is negligible. After MSRA implementation the Council responded to a declaration of overfishing on the EPO yellowfin tuna stock by making recommendations for action at the international level to end overfishing consistent with Section 304(i); again, the relative impact of west coast fisheries was determined negligible so no new domestic regulations were proposed.

### Establishing ACLs for Shortfin Mako and/or Common Thresher Shark

The Council eliminated from detailed consideration alternatives that would have required ACLs for all of the HMS MUS except for common thresher and shortfin mako shark. The rationale for excluding

<sup>6</sup> The overfishing declaration was based on two stock assessments, one for a stock in the WCPO and the other in the EPO.

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other MUS from consideration is based on the relatively small fraction of total stock-wide fishing mortality accounted for by west coast fisheries (with the possible exception of North Pacific albacore and common thresher shark) and the active consideration of conservation measures for target stocks (tunas) and incidental catch (sharks, dorado) by Pacific RFMOs.

In terms of the fraction of total fishing mortality accounted for by west coast fisheries, common thresher is likely the highest of the HMS MUS (for this and other unassessed species, precisely determining the west coast fraction is confounded by the lack of available catch data for other countries' fisheries). Information presented in Section 3.1.1.3 suggests that LMSY for common thresher may be higher than the estimate developed for the FMP and used to determine OY and the harvest guideline. Although the FMP allows adjustment of harvest guidelines under the biennial process, the action alternatives include provisions to also adjust MSY/OY estimates, ensuring consistency. Since the FMP states that a harvest guideline is equal to OY, adjusting a harvest guideline requires changing the OY. Language added to Chapter 5 of the FMP authorizes changes to numerical estimates of MSY, OY, and SDC as part of the biennial management process. If the OY was not adjusted, a new harvest guideline based on the best scientific information could be higher than the OY established in the FMP.

Requiring ACLs for shortfin mako (Alternative 3) and/or common thresher (Alternatives 3-4) could have environmental benefits compared to not requiring ACLs (Alternatives 2, 5). Of these two species, common thresher has the more coastal distribution and is less likely to be subject to RFMO management. The fact that it is a transboundary stock shared with Mexico should not be conflated with the issue of international management. While thresher sharks as a group are on the UNCLOS Annex I list and referenced in Pacific RFMO conservation measures (e.g., WCPFC CMM 2009-04), other thresher species, such as pelagic and bigeye, are more likely to be caught in fisheries subject to IATTC or WCPFC shark-related conservation measures. Shortfin mako has a more oceanic distribution, as indicated by information on tag recapture presented in Chapter 3; and in 2010 the International Scientific Committee for Tuna and Tuna-like Species in the North Pacific Ocean (ISC) formed a shark working group with shortfin mako identified as a potential candidate for assessment.<sup>7</sup> This indicates an interest at the international level in determining whether the stock is in need of active management. On the other hand, as recognized in the HMS FMP, shortfin mako could be subject to local depletion in the absence of effective harvest management. Although this would not constitute overfishing at the stock level, it would have adverse socioeconomic impacts related to not achieving OY.

Although the international exception is applied to shortfin mako and/or common thresher under Alternatives 2 and 5 (the Preferred Alternative), current harvest guidelines for these two stocks would remain in place. The accountability mechanisms for managing an ACL are generally stronger than those for a harvest guideline since no remedial action is required if a harvest guideline is exceeded. However, as discussed above, current catch was evaluated against the harvest guideline and additional management measures were considered as part of the biennial management process in 2008 (2009-2011 biennial period), although ultimately the Council decided that additional measures were unnecessary. This demonstrates that current mechanisms contained in the FMP can be used to address a conservation concern if one arises. In addition, all of the action alternatives amend the FMP to authorize the Council to optionally establish ACLs even for stocks otherwise subject to the international exception. Thus, if the Council determines that an ACL would be a more effective management control than a harvest guideline, one could be established.

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<sup>7</sup> See [http://isc.ac.affrc.go.jp/pdf/ISC10pdf/ISC10\\_Plenary\\_Final.pdf](http://isc.ac.affrc.go.jp/pdf/ISC10pdf/ISC10_Plenary_Final.pdf)

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## **Accounting for Scientific and Management Uncertainty**

Since explicit consideration of management uncertainty is incorporated into the ABC/ACL reference points, it would only be applicable under the action alternatives to those stocks for which ACLs would be set, shortfin mako (Alternative 3) and common thresher (Alternatives 3 and 4). The current 25 percent precautionary reduction from LMSY used to establish the OYs for these stocks, although applied because of vulnerability, may be sufficient to address scientific uncertainty. ABCs and ACLs would be established and adjusted through the biennial management process. A more explicit accounting for scientific uncertainty could be applied during this process if ACLs were to be established.

The Council-preferred Alternative (Alternative 5) applies the international exception to all HMS MUS. Under this alternative there would be no requirement for the Council to establish ABCs and ACLs for HMS MUS. However, under this alternative, the Council may consider changes to OY under the biennial process (the harvest guidelines are set equal to the current estimate of OY). In re-evaluating OY, the Council would have the option of taking scientific uncertainty into account more explicitly and establishing or changing harvest guidelines accordingly.

The Council also has the option of evaluating management targets for assessed stocks managed through the RFMOs. A number of statistical techniques have been developed and applied to stocks managed under the Council's other FMPs (e.g., "p-star") that could potentially be applied to assessed HMS stocks. This information could be used to make recommendations to U.S. delegations on appropriate management targets/limits to advocate in RFMO forums.

## **Biennial Management Process**

Under the Alternatives 2-5, the FMP is amended to put somewhat more emphasis on the re-evaluation and updating (if necessary) of numerical estimates for MSY, SDC, and OY as part of the biennial process. The Council-preferred Alternative (Alternative 5) includes the additional step of NMFS review of Council-proposed changes to these estimates. However, in terms of consideration of management measures, the action alternatives do not differ materially from No Action. Currently, the Council has the flexibility to develop and recommend management measures in response to a conservation concern.

With the exception of common thresher and North Pacific albacore tuna, the Council has not considered additional management measures related directly to the stock status of HMS FMP MUS. In 2006 the Council recommended a recreational bag limit for albacore in California and in 2010 considered, but did not adopt, an albacore bag limit for Washington State recreational fisheries. The Washington State recreational bag limit proposal references RFMO conservation measures requiring nations to not increase fishing effort on the North Pacific albacore stock (WCPFC CMM 2005-03 and IATTC Resolution C-05-02). These measures demonstrate how the biennial management process can be used to consider management measures to address the relative impact of west coast fisheries on internationally-managed HMS stocks. Council consideration of recreational management measures for common thresher shark in 2008, discussed above, offers another example of how the biennial process works in relation to a stock where west coast catch is likely a significant fraction of the catch from a local stock (with Mexico likely accounting for much of the rest of thresher shark catch). These examples demonstrate how the Council may consider management measures in relation to a harvest-related conservation concern.

The management framework recognizes the need to work through the RMFOs. Under the action alternatives, while there may be more explicit consideration of biological reference points as part of the

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biennial process, in most cases the Council will continue to recommend action at the international level, because west coast fisheries account for a small fraction of stock-wide catch.

### **Reclassification of Stocks in the FMP**

The action alternatives vary from Alternative 2, retaining all 34 monitored species as EC species to Alternative 5 (Council-preferred), retaining six of the current monitored species as EC species. In addition, under Alternatives 4 and 5 two MUS, bigeye thresher and pelagic thresher sharks would be moved to the EC category. Under Alternative 3 and 4, opah, a monitored species, would be reclassified as an MUS. (Table 2-6 lists MUS and EC species under each of the action alternatives.) Chapter 2 discusses the criteria that were developed for determining whether to retain monitored species as EC species under the different action alternatives, as well as the rationale for reclassifying bigeye and pelagic threshers as EC species and opah as an MUS.

Alternative 2 is essentially equivalent to No Action, because monitored species are retained as EC species, and as noted, these two categorizations have equivalent functions. Therefore, impacts under Alternative 2 are not likely to be different from No Action in terms of monitoring significant trends or changes in bycatch and incidental catch.

Alternatives 3, 4, and 5 are evaluated based on the reclassification decisions as follows:

EC species (Alternatives 2-5): Alternatives 3 and 4 retain 11 of the current monitored species while Alternative 5 retains six of the monitored species as EC species. Including fewer species in the EC category compared to the current monitored list will allow managers to more effectively focus monitoring efforts on species where a conservation concern could develop. Alternative 5 applies more rigorous criteria to the reclassification decision, compared to Alternatives 2-4, based on the purpose of the EC species category. While Alternatives 2-4 exclude species that are less frequently encountered in HMS fisheries, Alternative 5 additionally excludes species with significant landings, since EC species are “not generally retained for sale or personal use.” Any of these species could be considered for addition to the list of HMS FMP MUS, although only one species, opah, was considered as part of this proposed action (see discussion below). As discussed in Chapter 3, the other species with significant landings not included in the HMS FMP under Alternative 5 (Council-preferred) is Pacific bonito. Future consideration of whether to add opah, Pacific bonito, or any other species to the HMS FMP MUS list would be based on whether they are regularly targeted in west coast HMS fisheries and in need of active management at the Federal level. The Council determined that at this time California State management measures are sufficient and these species do not meet the criteria originally established in the FMP for determining which species to include in the MUS list. Since no conservation concern has been identified for these two species and future action could bring them under Federal management if necessary, not including them in the FMP at this time is unlikely to result in significant adverse impacts.

Reclassification of bigeye and pelagic thresher sharks from MUS to EC species (Alternatives 4 and 5): Information presented in Chapter 3 demonstrates that these species are caught in modest amounts. Pelagic thresher likely falls within the criteria for consideration as an EC species under Alternative 5 (average catch landings 2000-2008 between 1 and 5 mt) based on average commercial landings of 1.4 mt (see Table 3-2). Discard mortality and recreational catch may add slightly to this figure. Bigeye thresher commercial landings averaged 5.4 mt for the time period, slightly above the range used in Alternative 5. A gain, recreational catch and commercial discard mortality may add slightly to this average. (Note that recreational landings reported in the HMS SAFE document do not include pelagic and bigeye thresher, suggesting they are rarely caught in recreational fisheries.) Although catches of bigeye thresher are somewhat higher, given that this species was originally included in the FMP as an MUS, there is an interest in retaining it in the FMP under the EC category. Moving these species to the

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EC category recognizes that current small levels of landings, which suggests that active management of catch is not necessary.

The HMS FMP notes that they were included as MUS primarily because of their probable vulnerability in relation to HMS fisheries. According to the scores presented in Table 3-4 these two species have productivity scores similar to those for common thresher and shortfin mako but lower susceptibility scores. Blue shark has both a higher productivity score and vulnerability score. This information provides an additional rationale for moving bigeye and pelagic thresher to the EC category. They are not substantially less productive than the other managed shark species but are somewhat less susceptible to west coast fisheries. The impact of moving these two species to the EC category is likely to be minor, both because of these characteristics and the fact that commercial and recreational harvest management measures for target species (such as time and area closures and bag limits) have a secondary effect on limiting catches of these species. Thus, even though Federal management measures may not be developed specifically for these two species, regulations pursuant to the HMS FMP may still indirectly constrain their incidental harvest. Commercial and recreational catch of these species would continue to be monitored and reported in the annual SAFE document. This allows any significant changes in catch trends to be identified and the Council to respond as necessary through the biennial management process.

Reclassification of opah from monitored species to MUS (Alternative 3 and 4): Chapter 3 presents information on recent landings of opah by HMS gear types. As discussed above, opah landings are relatively high, so this species does not fit into the EC species category. For this reason the Council considered adding opah the HMS FMP MUS list. Under Alternative 5 (Council-preferred) opah would not become an HMS MUS or EC species, and thus be removed from the FMP. The rationale and likely impacts of not including opah in the FMP are discussed above, relative to evaluating EC species classification decisions.

## **2.10 Summary of the Provisions of the Alternatives**

### **2.10.1 Alternative 1 (No Action)**

The Council continues to provide advice to U.S. RFMO delegations as the primary means to prevent/end overfishing on HMS stocks. If the Secretary determines that overfishing is occurring on an internationally managed stock, MSA Section 304(i) applies. Under this section the Council provides a report to Congress and the Departments of Commerce and State describing measures needed at the international level to end overfishing and proposes domestic regulations to address the relative impact of U.S. fishing vessels.

Catch estimates for common thresher and shortfin mako sharks are periodically compared to established harvest guidelines. If information suggests a harvest guideline has been or is likely to be exceeded within two years the Council may implement additional management measures through the biennial process.

If significant trends or changes in the status of monitored species are detected, they are documented in the SAFE. The SAFE may include recommendations concerning bycatch and incidental catch.

Since the HMS FMP has been implemented, no catch controls have been established under the management framework that have had an adverse socioeconomic impact.

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## **2.10.2 Alternative 2**

No change from No Action except:

- Identification and regular reporting of SDC, especially OFLs/MFMT, could provide additional criteria relative to Secretarial determination of overfishing and action under MSA Section 304(i).
- The Council could consider adjustments to numerical estimates of MSY and OY, and any related harvest guidelines as part of the biennial process. These estimates would benefit from the best available science, as opposed to No Action where no process is clearly spelled out in the FMP for adjusting these estimates.
- Coordination with the WPFMC on identification of reference points for stocks would be needed.

## **2.10.3 Alternative 3**

In addition to the effects described for Alternative 2, the following would apply under this alternative:

- The Council would have the opportunity to implement management measures for opah, should a need be identified under the framework described in Chapter 5 of the FMP.
- A fewer number of monitored EC species (11) could allow more effective tracking of the status of these stocks.
- ACLs for shortfin mako and common thresher sharks would establish a stricter standard for limiting catch than the current harvest guidelines. If an ACL is exceeded more than once in four years the Council would have to implement appropriate AMs.

## **2.10.4 Alternative 4**

The effects of Alternative 4 would be the same as those described under Alternative 3 except:

- ACLs are only set for common thresher shark. Given information on the distribution and migration patterns of shortfin mako shark, this stock is more likely to be encountered in internationally-managed pelagic fisheries. Therefore, the application of the international exception is appropriate.
- The reclassification of pelagic and bigeye thresher as EC species recognizes that they are less frequently encountered and landed in west coast HMS fisheries. The catch of these species would continue to be monitored. This change is unlikely to have a substantial effect on the conservation of these stocks from a west coast perspective.

## **2.10.5 Alternative 5 (Council-preferred Alternative)**

The effect of Alternative 5 would be the same as those under Alternative 2 except:

- A fewer number of monitored EC species (8) could allow more effective tracking of the status of these stocks.
- The reclassification of pelagic and bigeye thresher as EC species recognizes that they are less frequently encountered and landed in west coast HMS fisheries. The catch of these species would continue to be monitored. This change is unlikely to have a substantial effect on the conservation of these stocks from a west coast perspective.
- Council submits any proposed adjustments to numerical estimates of MSY and OY to NMFS for review. This is consistent with the requirements of the MSA.

## CHAPTER 3 **AFFECTED ENVIRONMENT**

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### **3.1 Fish Stocks**

As noted in the description of the No Action Alternative in Chapter 2, the HMS FMP currently includes 13 MUS: five tunas, two billfish, five sharks, and dorado. This section provides information on the distribution and status of these species.

#### **3.1.1 *Managed Species in the HMS FMP***

Information on distribution, stock structure, stock status, and catches of FMP-managed species is briefly summarized below. Appendices B and F of the HMS FMP provide information on the status and life history of these stocks. HMS SAFE documents provide updated information on the status of stocks and report recreational and commercial landings on the west coast. This information is incorporated by reference and forms the basis of the summaries below.

##### **3.1.1.1 Tunas**

###### **Albacore**

Two separate albacore stocks are recognized in the Pacific, one in the North Pacific and the other in the South Pacific. For the purpose of the HMS FMP North Pacific albacore is considered the managed stock. The principal gear types used to catch albacore are longline, troll, and pole-and-line. During the five years 2003-2007, fisheries based in Japan accounted for 63.2 percent of the total harvest, followed by fisheries in the United States (16.9 percent), Canada (7.4 percent), and Chinese Taipei (6.8 percent) (ISC-ALBWG 2008). Other countries catching North Pacific albacore contributed 5.7 percent and included Korea, Mexico, Tonga, Belize, Cook Islands, and longline catches from vessels flying flags of convenience. The total catch of albacore for all nations combined peaked at a record high of 127,376 metric tons (mt) in 1999, but has declined over the course of the last several years and has averaged roughly 86,000 mt since 2000. Table 3-1 shows west coast and stock-wide catches for North Pacific albacore and other HMS MUS.

The last albacore stock assessment was completed in December 2006 using fishery data through 2005. Stock status and conservation advice were provided to the ISC7 Plenary (July 2007) and to the WCPFC Northern Committee (NC) in September 2007. Spawning stock biomass (SSB) estimates for the period 1966-2006 show fluctuations around an estimated time series average of roughly 100,000 mt. The

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assessment demonstrates a recent increase in SSB from 73,500 mt in 2002 to 153,300 mt in 2006 with a projected further increase to 165,800 mt in 2007. The recent increases are likely due to strong year classes in 2001 and 2003. Despite the high SSB estimates relative to the time series average, fishing mortality rates are high relative to most commonly used reference points. The population is being fished at roughly  $F_{17\%}$  (i.e., at a rate resulting in a reduction of the spawning potential ratio to 17 percent of the maximum spawning potential ratio in the absence of fishing). If fishing continues at the current level, and all else being equal, then SSB is projected to decline to an equilibrium level of 92,000 mt by 2015. Considering the high fishing mortality rates, and the fact that total catch has been in decline since 2002, the ISC recommended that all nations practice precautionary-based fishing practices. The next albacore stock assessment is scheduled for 2011.

The IATTC adopted a Resolution on Northern Albacore Tuna in 2005. It calls upon nations to not increase the total level of fishing effort for North Pacific albacore tuna in the EPO. Resolution C-05-02 on northern albacore tuna calls upon all Parties (CPCs) to take the necessary measures to ensure that the level of fishing effort by their vessels fishing for North Pacific albacore tuna is not increased. It also calls upon all CPCs to report all catches of North Pacific albacore, by gear type, to the IATTC every six months. The WCPFC adopted a similar conservation measure in 2005 applicable within their Convention Area (generally, west of 150° W longitude in the Pacific Ocean). These measures call on nations to not increase their total level of fishing effort on North Pacific albacore beyond current levels. In 2009 the NC recommended a revision of CMM 2005-03 that would have specified “current levels” as the 2002-2004 average level. However, this revision was not adopted by the WCPFC Plenary due to an objection about its application to fisheries south of 20° N latitude.

### **Bigeye Tuna**

Two bigeye stocks are recognized in the Pacific, one in the Western and Central Pacific and the other in the Eastern Pacific, although there is uncertainty about whether biologically there is in fact a single stock Pacific-wide. For the purposes of management they are treated separately and separate assessments are conducted. Bigeye tuna is regularly assessed by the WCPFC for the WCPO stock and by the IATTC for the EPO stock.

Bigeye have a generally tropical to subtropical distribution. Catches are less than the other tropical tunas, yellowfin and skipjack. As shown in Table 3-1, EPO bigeye catches averaged about 101,000 mt annually, 1996-2007, compared to 276,000 mt for EPO yellowfin and 174,000 for EPO skipjack. Both purse seine and longline fisheries catch bigeye. Bigeye co-occur with yellowfin at certain times and areas and the two species are caught together in the purse seine fishery. An increase in the use of fish aggregation devices (FADs) in the purse seine fishery has resulted in the catch of smaller fish, including bigeye and skipjack tuna. Catch of fish below critical size has contributed to overfishing.<sup>8</sup>

In 2004 NMFS declared that overfishing was occurring Pacific-wide. In coordination with the WPFMC the Pacific Council adopted a strategy to end overfishing on the EPO bigeye stock, which is described in Section 4.5.1 of the HMS FMP. The discussion in the FMP responds to the requirements of the MSA Section 304(e), because Section 304(i), relative to international overfishing was not part of the MSA at that time.

Both the IATTC and WCPFC have adopted successive annual or multi-year conservation measures for bigeye, usually in combination with measures for yellowfin tuna, because of their co-occurrence in the

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<sup>8</sup> Critical size is “the average size of the fish in a year class at the time when the instantaneous rate of natural mortality equals the instantaneous rate of growth in weight for the year-class as a whole.” ([http://www.nefsc.noaa.gov/techniques/tech\\_terms.html#crs](http://www.nefsc.noaa.gov/techniques/tech_terms.html#crs)).

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purse seine fishery. The WCPFC adopted a 3-year measure in 2008, CMM 2008-01 with limits on both purse seine and longline fisheries. The overall objective of the measure is to reduce fishing mortality on the stock by 30 percent from the 2001-2004 average level. However, a 2009 evaluation found that this objective was unlikely to be met (Hampton and Harley 2009). The current IATTC conservation measures are contained in Resolution C-09-01, which covers 2009-2011. Conservation measures include time and area closures for the purse seine fishery and national TACs for the longline fishery.

West coast fisheries account for a small fraction of the EPO catch, 0.05 percent according to the data presented in Table 3-1.

### **Skipjack Tuna**

Separate EPO and WCPO skipjack stocks are recognized. Skipjack is principally caught in purse seine fisheries and this species accounts for the largest portion of HMS catches in the Pacific, although EPO catches are much smaller than in the WCPO. Skipjack is difficult to assess due to uncertainties about stock structure, vulnerability of age classes, and how well fishery catch per unit of effort (CPUE) tracks abundance. The stock is regularly assessed by the WCPFC in the WCPO and the IATTC in the EPO. Although there are uncertainties, these stocks are generally considered healthy, although catch may be approaching MSY. West coast landings account for about 1 percent of EPO catch (Table 3-1).

### **Yellowfin Tuna**

Yellowfin are distributed throughout the tropical and sub-tropical Pacific, but there is evidence of restricted mixing between WCPO and EPO populations. Separate EPO and WCPO yellowfin stocks are recognized for the purposes of assessment and management. The IATTC and WCPFC regularly assess yellowfin (IATTC 2009; Langley, *et al.* 2009). In the EPO, if no stock assessment relationship is assumed, SSB has declined since 2001 to AMSY and  $F$  is near  $F_{MSY}$ . Recent catches have been well below MSY. As with bigeye, catch of small fish in the purse seine floating object (FAD) fishery has reduced MSY. Increased catch in longline fisheries and reduced catch by purse seine fisheries could increase MSY. Status of the WCPO stock is similar. The stock is considered fully exploited in Region 3, which encompasses Indonesia and the Philippines, so increased catch in this area is a concern. One of the difficulties with CMM-2008-01 is that, while it calls on these two countries to reduce fishing effort in line with the measure's objective, no specific management controls are identified in the conservation measure for fisheries in the nations' waters.

In 2006 the Council was notified that the EPO yellowfin stock was subject to overfishing. The Council responded under the new provisions in the MSRA, which added Section 304(i) to the MSA on international overfishing. Consistent with that provision, in April 2008 the Council found that no new domestic regulations to address the relative impact of U.S. fishing vessels on the stock are needed. Recommendations on international actions to end overfishing were made to NMFS, the Department of State, and Congress, consistent with MSA requirements. West coast fisheries account for 0.6 percent of EPO yellowfin catch (Table 3-1).

### **Bluefin Tuna**

The North Pacific bluefin tuna stock is relevant to west coast fisheries. Bluefin are caught in purse seine, longline, and troll fisheries. Bluefin is highly desired in the sashimi market in Japan and purse seine vessels in Mexico and elsewhere capture juveniles for grow out in net pen operations. The stock is assessed on a regular basis (although not with the frequency of bigeye and yellowfin) by the ISC. The last full assessment was completed in 2008 with an update conducted in 2009. A key finding by the ISC, from a management perspective, is that "Current  $F$  (2002-2004) is greater than commonly used

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biological reference points (BRP) that may serve, in principle, as potential target reference points” (ISC 2009). In response the WCPFC NC drafted an interim (1-year) conservation measure for bluefin tuna, which was adopted at the WCPFC Plenary in December 2009.<sup>9</sup> CMM 2009-07 calls on nations to not increase total fishing effort on bluefin (in the area north of 20° N latitude) beyond the 2002-2004 level in 2010. Catch of juvenile (age 0-3) bluefin is of particular concern. The effectiveness of the measure is limited because fisheries in the Korean EEZ were exempted and it appears that coastal purse seiners in these waters are a substantial contributor to juvenile fishing mortality. In addition, “artisanal fisheries” are exempted, and small-scale coastal fisheries, to which this term refers, are also a contributor to juvenile mortality. In the EPO Mexico accounts for the vast majority of the bluefin catch; according to data used in the last ISC assessment, provisional estimates for 2006 show Mexico’s catch was 9,706 mt out of a total 9,803 mt for the EPO (PBFWG 2007). Table 3-1 shows west coast landings averaging 4.3 percent for the 1996-2007 period but since 1999 the west coast fraction has accounted for about 1 percent or less.

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<sup>9</sup> In 2010 the WCPFC will consider a replacement measure for 2011-2012 that removes the exemption for the Korean EEZ.

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**Table 3-1. Stockwide and west coast landings (metric tons) of tunas managed in the HMS FMP and west coast landing as a percent of stockwide catch (Sources: 2009 HMS SAFE, FAO Fisheries and Aquaculture Information and Statistics Service.)**

Stock	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	Average
<b>Stockwide Catch</b>													
Albacore (NPO)	84,576	104,973	94,106	119,588	83,979	98,792	109,323	99,805	91,641	62,055	66,064	91,150	92,171
Bigeye (EPO)	98,577	103,525	88,886	84,135	124,845	115,342	124,582	106,999	97,948	92,207	97,469	76,960	100,956
Bigeye (WCPO)	92,412	120,895	122,161	122,150	124,234	115,098	130,302	117,968	156,348	137,221	138,764	142,558	126,676
Pacific bluefin	19,127	19,296	13,922	18,633	26,415	16,731	16,081	18,409	20,427	25,015	21,618	16,845	19,377
Skipjack (EPO)	94,640	131,707	136,081	247,321	181,956	121,113	136,492	237,542	166,533	228,807	239,450	165,657	173,942
Skipjack (WCPO)	1,022,589	965,188	1,309,692	1,175,558	1,238,181	1,137,011	1,312,991	1,315,246	1,404,977	1,504,770	1,566,472	1,697,856	1,304,211
Yellowfin(EPO)	252,294	265,039	270,897	287,015	269,830	386,024	405,483	375,770	243,538	255,375	154,510	146,564	276,028
Yellowfin (WCPO)	322,072	440,958	462,769	402,589	430,147	425,924	408,900	441,539	374,844	438,236	439,754	435,741	418,623
<b>West Coast Landings</b>													
Albacore	14,173	11,292	13,915	9,770	9,074	11,194	10,029	16,671	14,540	9,055	12,788	11,586	12,007
Yellowfin	3,347	4,775	5,799	1,353	1,159	655	544	465	488	285	77	104	1,588
Skipjack	5,455	6,070	5,846	3,759	780	58	236	349	307	523	48	5	1,953
Bigeye	62	82	53	108	86	53	10	35	22	10	35	13	47
Bluefin	4,688	2,251	1,949	186	313	196	11	36	10	207	1	45	824
<b>West Coast Landings as a % of Stockwide Catch</b>													
Albacore (% NPO)	16.8%	10.8%	14.8%	8.2%	10.8%	11.3%	9.2%	16.7%	15.9%	14.6%	19.4%	12.7%	13.0%
Yellowfin (% EPO)	1.3%	1.8%	2.1%	0.5%	0.4%	0.2%	0.1%	0.1%	0.2%	0.1%	0.0%	0.1%	0.6%
Skipjack (% EPO)	5.8%	4.6%	4.3%	1.5%	0.4%	0.0%	0.2%	0.1%	0.2%	0.2%	0.0%	0.0%	1.1%
Bigeye (% EPO)	0.06%	0.08%	0.06%	0.13%	0.07%	0.05%	0.01%	0.03%	0.02%	0.01%	0.04%	0.02%	0.05%
Bluefin (% Pacific)	24.5%	11.7%	14.0%	1.0%	1.2%	1.2%	0.1%	0.2%	0.0%	0.8%	0.0%	0.3%	4.3%

### 3.1.1.2 Billfish

#### **Striped Marlin**

The stock structure of striped marlin in the Pacific Ocean is not well known. A special session of the ISC Billfish Working Group was convened in the fall of 2009 to address stock structure issues. The Billfish Working Group assessed NPO striped marlin in 2007. Although stock status is difficult to determine, model results indicate the biomass has declined to 6 to 16 percent of the 1952 level. Landings and indices of abundance have also declined. The 2009 ISC Plenary reconfirmed their existing recommendation that fishing mortality on striped marlin be reduced from the 2003 level. The IATTC conducted an assessment for striped marlin in the EPO and found the stock to be healthy in contrast to the ISC findings. A conservation measure for striped marlin was considered by the WCPFC in 2009 but action on it was deferred to 2010.

Japan has accounted for the largest share of total catch in recent years, at around 70-80 percent of total catch. Marlin are an incidental catch in longline fisheries. Under the HMS FMP commercial landings of striped marlin are prohibited. Striped marlin is a valued recreational species. Table 4-58 in the HMS SAFE reports private recreational catch of HMS with no catches reported since 2001 (no catch includes both zero values and no data), but this likely represents an absence of data rather than lack of catch. Similarly, Table 4 in the 2010 ISC Plenary Report (ISC 2010) does not show U.S. recreational catch after 2000. Recorded California CPFV catches have been less than 10 fish in most years, although 2007 shows an anomalously high value of 93 (see Table 4-64a in the 2009 HMS SAFE).

#### **Swordfish**

The North Pacific swordfish stock is relevant to west coast fisheries. There is also a South Pacific stock and associated fisheries. The ISC Billfish Working Group completed a stock assessment for North Pacific swordfish in 2009 (ISC 2009, Annex 7). They considered two scenarios: a single stock in the North Pacific or separate stocks, one in the northwest Pacific and a second in the central the EPO, separated by an irregular boundary extending from Mexico to the southwest and including sections of the eastern South Pacific extending to 20° S latitude. Under the two-stock hypothesis one stock is considered in the WCPO and the other in the EPO. Both stocks are considered healthy and well above the level required to sustain recent catches.

On the west coast swordfish are principally landed by the California DGN fishery. The longline fishery for swordfish is currently prohibited under the HMS FMP and ESA regulations implemented pursuant to the ESA Section 7 consultation on the FMP when it was implemented. In 2007 the Council recommended NMFS issue an EFP to allow a single vessel to target swordfish with longline gear but the permit was not issued. The Council also considered a proposal for a limited fishery outside the EEZ but ultimately rejected this proposal.

Japan accounts for the biggest share of swordfish catch in the North Pacific, principally in their distant water longline fishery. The west coast share of swordfish landings averaged about 10 percent over the 1995-2005 period. However, with the implementation of the HMS FMP in 2004, which closed the longline fishery targeting swordfish, west coast landings dropped substantially from about 1,000-2,000 mt annually to slightly over 500 mt annually.

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## 3.1.1.3 Sharks

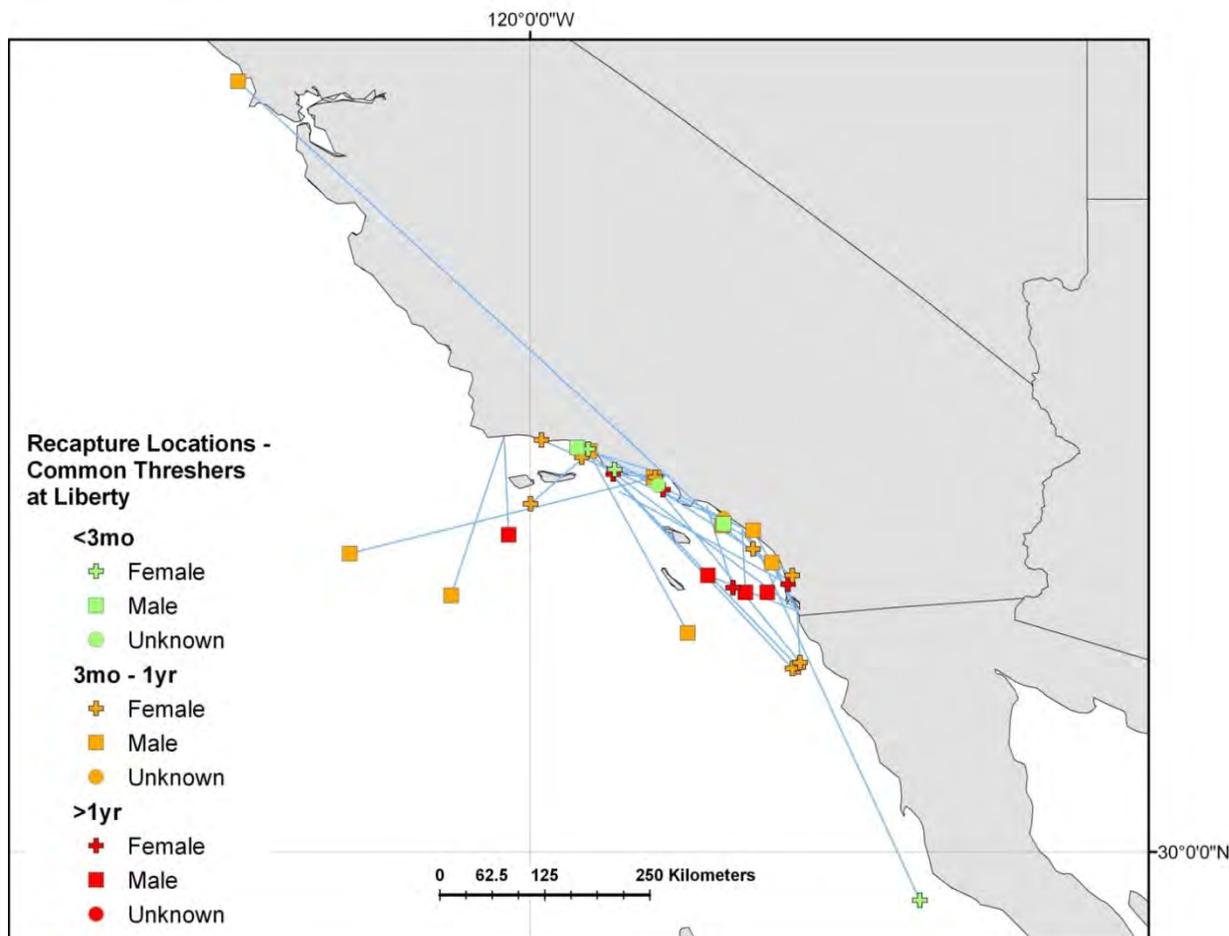
Table 3-2 shows shark MUS landings and the average for the period 2000-2008.

**Table 3-2. Shark MUS landings (mt), 2000-2008. (Source: PacFIN)**

Year	Common Thresher	Pelagic Thresher	Bigeye Thresher	Shortfin Mako	Blue
2000	296.0	3.2	4.6	80.1	0.8
2001	373.0	2.1	2.3	46.3	2.2
2002	300.7	2.1		81.9	41.5
2003	301.0	4.2	5.7	69.8	0.8
2004	115.0	1.6	5.3	54.5	0.5
2005	178.9	0.5	9.6	33.4	0.9
2006	160.0	0.2	4.3	45.9	0.4
2007	203.9	1.7	4.9	44.5	9.8
2008	147.3	0.1	6.5	35.2	0.2
Average	230.6	1.8	5.4	54.6	6.3

### Common Thresher Shark

Common thresher is the most important commercial and recreational shark species in west coast fisheries. It is a secondary target in the California DGN fishery. The DGN fishery began in the late 1970s in the SCB. It is also an important artisanal fishery target in Baja California, Mexico. Although transboundary movement is likely, little is known about the fisheries in Mexico, because landings are not routinely reported. Figure 2 shows information on tag recapture locations provided by the SWFSC. These recapture locations suggest that common thresher shark has a relatively coastal distribution within the U.S. and Mexico EEZ.



**Figure 2. Tagged common thresher shark recapture locations.**

Recreational fisheries for shark have gained popularity in southern California in recent years. In 2008 the Council considered proposed new recreational management measures to address the rapid growth in these fisheries. However, based on a review of available catch and post-release mortality rate data, the HMSMT concluded that the combined commercial and recreational catch was still below the current harvest guideline of 390 mt. The Council decided that no new recreational management measures were necessary at that time, although the Council did recommend continuing efforts to gather data on thresher shark recreational catches.

A full stock assessment has not been conducted for this species. The local stock was likely depleted in the 1980s to about 32 percent of unfished biomass due to the rapid growth of the DGN fishery. Management controls imposed in the late 1980s and early 1990s likely has lead to some recovery in stock size. An analysis conducted in conjunction with the development of the HMS FMP estimated the population growth rate in order to develop a value for LMSY in the range of 390-510 mt. This estimate does not account for production in Mexican waters and is therefore a minimal estimate. These estimates were used to establish a harvest guideline under the FMP of 340 mt.

Figure 3 below shows the U.S. West Coast total landings of common thresher shark between 1981-2008 and a delta-general linear model (GLM) derived abundance index for the DGN fishery (NMFS Southwest Fisheries Science Center, preliminary results). The catch history reflects declines in effort as a consequence of time and area restrictions imposed to protect pupping thresher sharks and protected species. Based on the declining catches, and increasing trend in CPUE, a potential MSY could be

calculated as the average catch landed during the period when the CPUE was beginning to increase after the population decline in the mid 1980s, such as 1988-1994 in this example. As suggested by the figure, this estimate of LMSY would be above the current harvest guideline.

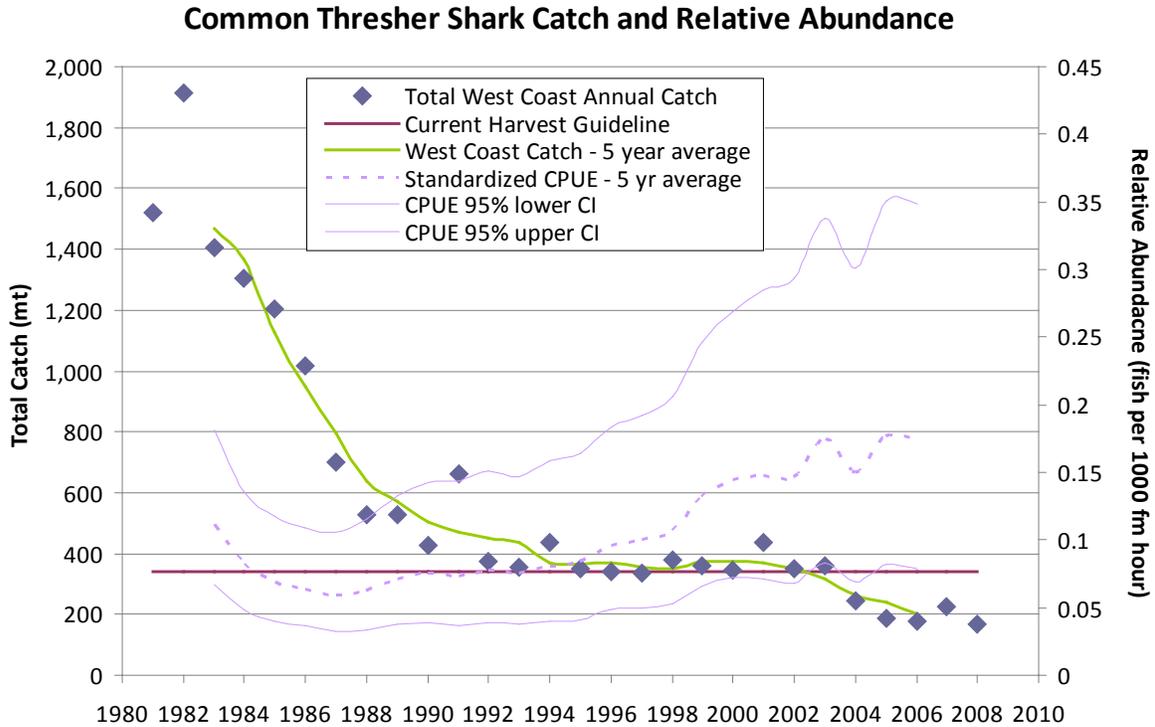


Figure 3. Common thresher catch (left scale) and relative abundance (right scale).

**Pelagic Thresher Shark and Bigeye Thresher Shark**

The HMS FMP FEIS (PFMC 2003, page 3-24) provides the following information on these two species:

Little is known of the biology and status of these sharks, and especially of their reproductive requirements. Individuals taken within the management area are thought to be on the edges of their habitat ranges, including depth-wise for the bigeye thresher which ranges into mesopelagic waters. They are minor components of West Coast fisheries, taken incidentally and presumably not overexploited, at least locally. The bigeye thresher occurs regularly but in low numbers (~9% of common thresher catch) in DGN catches, whereas the pelagic thresher is taken mainly in warm-water years. Both species are caught off Mexico, and the pelagic thresher is reported to be an important component of Mexican shark catches. These species appear to have thin or semi-isolated populations Pacific-wide. Present West Coast catches total under 50 mt/yr.

Table 3-2 shows west coast landings of these two species, 2000-2008.

**Shortfin Mako Shark**

Shortfin mako is primarily caught in the California DGN fishery. Longliners operating outside the west coast EEZ (where pelagic longline gear is prohibited) may also catch small amounts of this species. The

DGN fishery mainly takes juveniles and subadults age 3 or less, with the SCB evidently being an important nursery and feeding area for these age classes. Shortfin mako are widely distributed in the tropical and temperate Pacific with warm water years associated with more northward movement and greater susceptibility to west coast fisheries. Figure 4 shows tag recapture locations for shortfin mako. In contrast to common thresher, this species appears to have a broader oceanic movement pattern.

Shortfin mako is also a desirable recreational target. The 2009 HMS SAFE document indicates that since 2000 between 300 and 5,600 fish have been caught annually by private anglers. California CPFV vessels record a much smaller level of catch, ranging between 76 and 250 fish in the U.S. EEZ and 27 and 65 fish in the Mexican EEZ during this period.

The shortfin mako stock has not been assessed, and definitive information on stock structure is lacking. The HMS FMP adopted a 1981-1999 average annual catch of 200 mt as an LMSY proxy. A precautionary reduction from the LMSY proxy was made in recognition of the low productivity of this animal (0.04-0.06/year) and relatively high vulnerability (see discussion below). Based on this reduction the FMP established a harvest guideline of 150 mt. There is insufficient information to determine the fraction of stockwide catch represented by west coast catch.

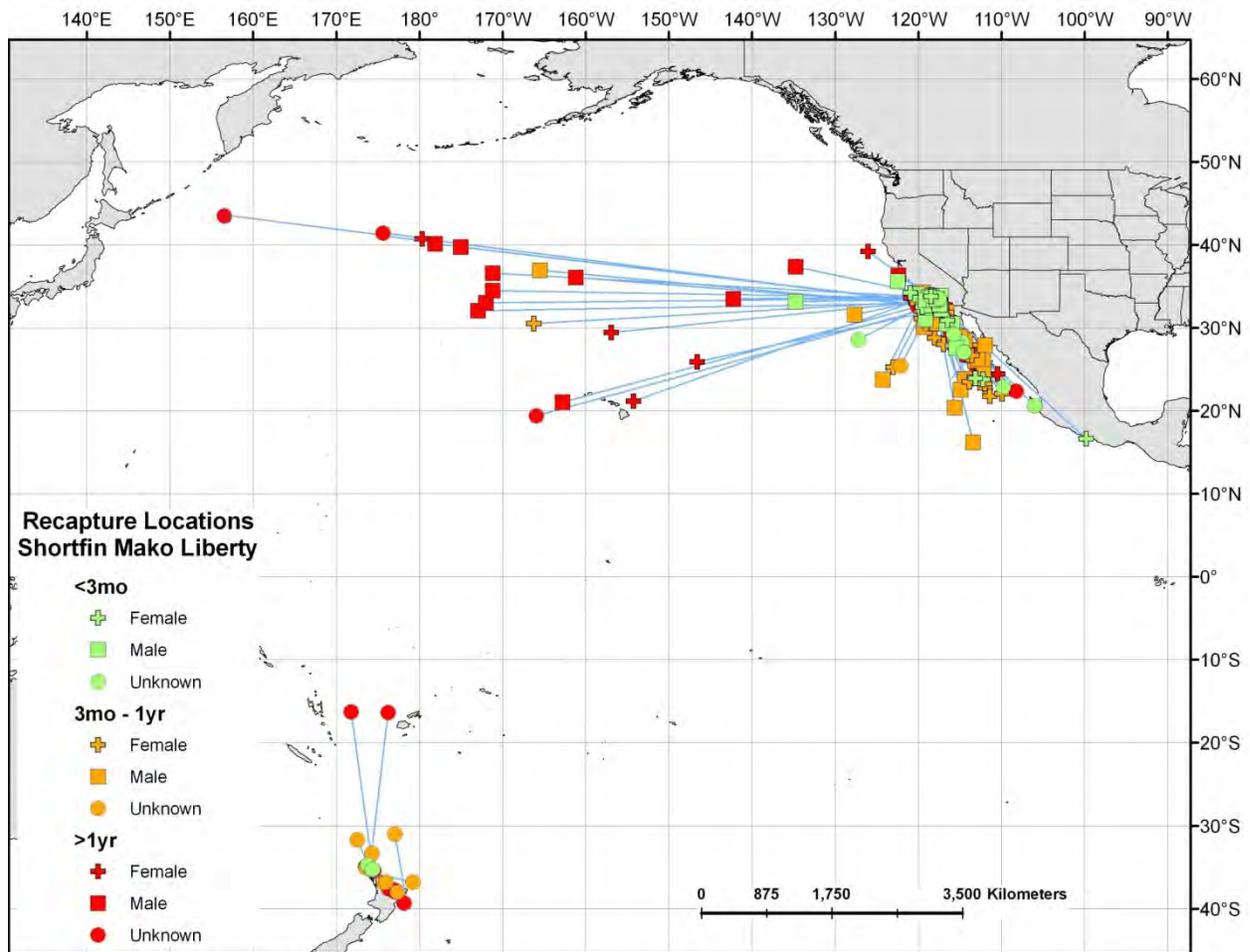
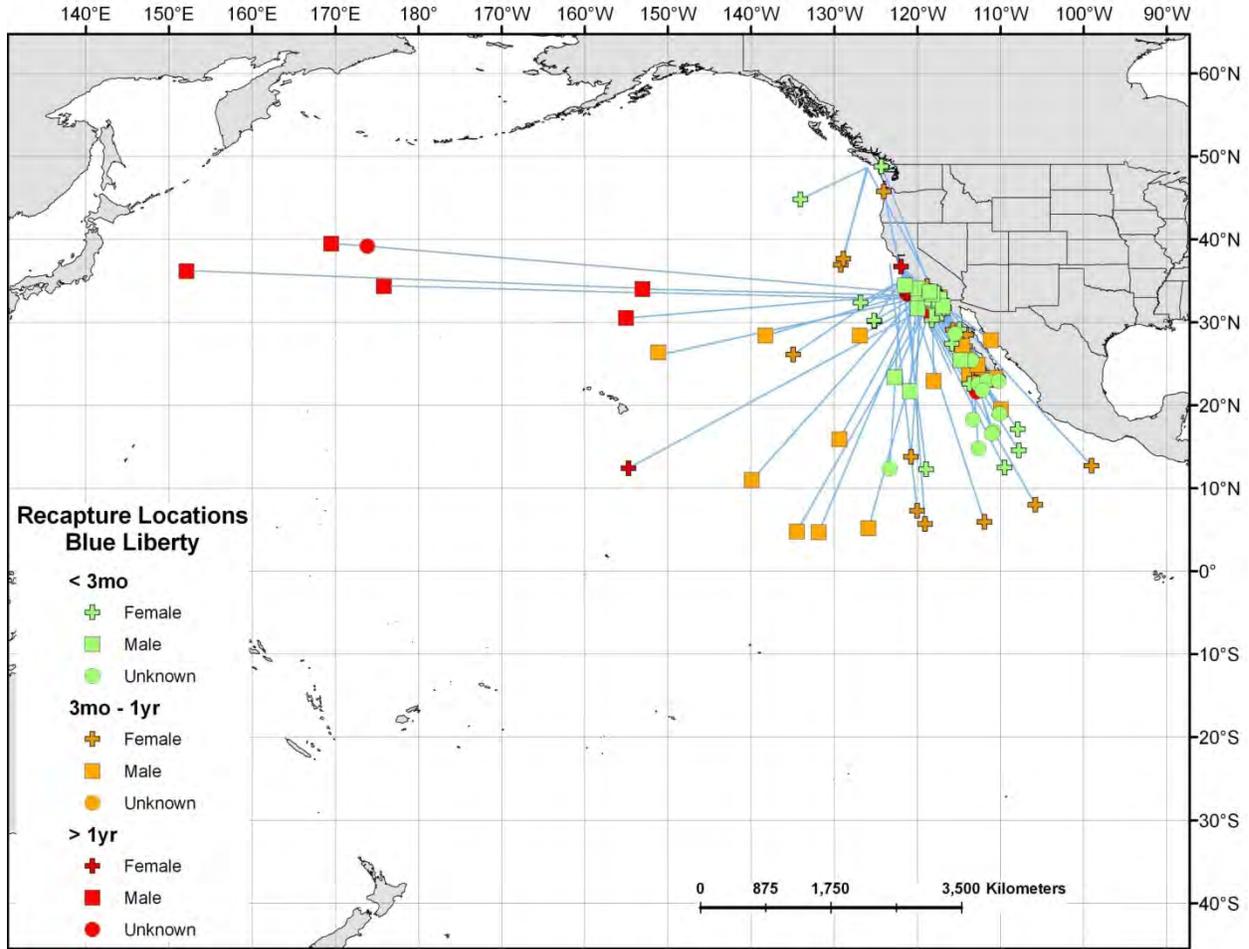


Figure 4. Tagged shortfin mako shark recapture locations.

## **Blue Shark**

Blue shark is probably the most commonly caught shark species in domestic and international HMS fisheries but has not been a target except in rare instances. In distant water longline fisheries targeting tunas, blue shark are not retained because the high level of urea in their tissue requires extensive processing to remove, which must occur shortly after capture. However, coastal fisheries for blue shark exist in Latin America. West coast commercial landings have been generally 1 mt or less annually with occasional years when higher landings are reported. For example, in 2001 the SAFE reports 41 mt landed. This may represent an effort to find a market for blue shark. But this level of catch was not sustained in subsequent years, suggesting that any such effort failed.

The blue shark is extensively distributed from tropic to temperate and coastal to oceanic waters of all oceans. It may be the most abundant of all large marine, top predators. Its northern reproducing/nursery areas appear to be the subtropic-subarctic transition waters spanning the entire north Pacific, including southerly extensions along the Pacific rim coasts (Nakano 1994). Based on distribution, there appears to be a single, Pacific-wide stock. Comparison of the disparate size distributions from the DGN fishery off California and the longline fishery operating north of Hawaii indicates that subadults move out from west coast waters to join the oceanic, adult portion of their population as they approach maturity, females leaving at younger ages than the males. Figure 5, showing tag recapture locations, is indicative of this pattern. Demographic studies indicate the blue shark is a relatively more productive species compared to other sharks.



**Figure 5. Tagged blue shark recapture locations.**

The most recent stock assessment for blue shark was completed in 2009 (Kleiber, *et al.* 2009). The results of this assessment summarized the status of blue shark in the Pacific as above MSY and, for many model scenarios, close to unfished biomass levels. The stock assessment produced a base case estimate of the ratio of “current” (1998-2001) biomass to long-term average MSY biomass of 1.08 and a similar  $F/F_{MSY}$  ratio of 0.86. Table 5-3 in the HMS SAFE presents an estimate of west coast total catch of less than 70 mt annually during recent years (catch is much higher than landings because, as noted, this species is usually discarded). Stock-wide catch is estimated in the assessment as varying from about 1.8 to 2.8 million animals annually since 1993. Catches were higher than that previously due to high seas driftnet fisheries that were subsequently prohibited.

#### 3.1.1.4 Dorado

According to the HMS FMP FEIS (PFMC 2003) catches of this tropical species had increased substantially in the SCB from the late 1970s to the late 1990s. Commercial landings reported in the SAFE are low, ranging from less than 0.5 to 16 mt since 2000. Reported recreational catch by private anglers appears highly variable with most years since 2000 showing around 200 fish caught, with occasional years such as 2006 and 2008 when more than 12,000 fish were caught. The CPFV fleet shows a similar pattern. The occasional years with higher commercial and recreational catches likely correlate with periods of increased sea surface temperature in the SCB.

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While dorado occur throughout the tropical Pacific, their migrations are more localized compared to other HMS. Dorado found in the SCB are likely originating from local populations reproducing off Mexico with the SCB representing the edge of their range (PFMC 2003).

Dorado has not been assessed and catches across their range are poorly documented because much occurs in artisanal fisheries in Latin America. At the time of FMP adoption there were no existing estimates of MSY, biomass, or total fishing mortality and such estimates have not been made to date. The FMP used an average of the annual catch for FAO area 77 between 1995-1999 as a proxy MSY, which was reported as 450 mt. (Area 77 encompasses the Eastern Central Pacific, see Figure 6.) However, dorado catches for this area reported in FAO Fishstat Plus are higher (see Table 3-3 and Figure 7).<sup>10</sup> For the 1995-1999 period they average 899 mt. For the period 2003-2008, which represents the most recent five years in that data set, the averaged was 4,841 mt. The large increase in landings from 2000 recorded in Fishstat Plus is mainly due to Costa Rica. This could reflect either the development of new fisheries or simply better reporting of landings. IATTC data for the EPO shows average annual catch for the past five years (2003-2008) of 9,829 mt (see Table 3-3 and Figure 7).<sup>11</sup> The IATTC data encompass a larger area, which could better represent the stock's range. In either case a catch-based MSY proxy based on these sources suggests a higher value than what was reported in the FMP. Based on these regional catch estimates, west coast catch represents a small portion of stock-wide catch.

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<sup>10</sup> See <http://www.fao.org/fishery/statistics/software/fishstat/en>

<sup>11</sup> See <http://www.iattc.org/Catchbygear/IATTC-Catch-by-species1.htm>

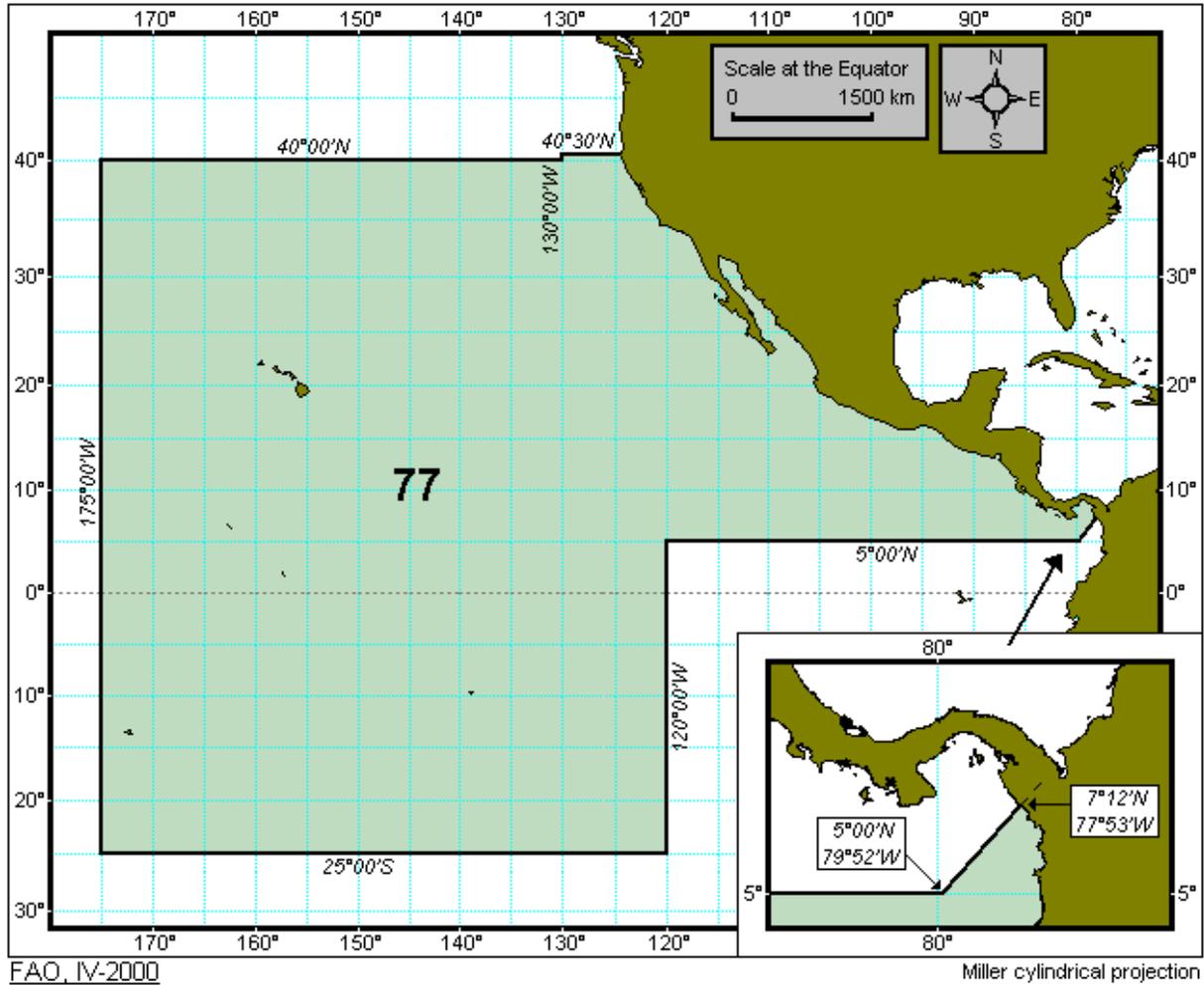


Figure 6. FAO Area 77. (Source: www.fao.org)

Table 3-3. Comparison of dorado average annual landing estimates for FishStat (Area 77) and IATTC (ETP) for two 5-year periods.

5-year Period	FishStat	IATTC
1995-1999	899	6,372
2004-2008	4,841	9,829

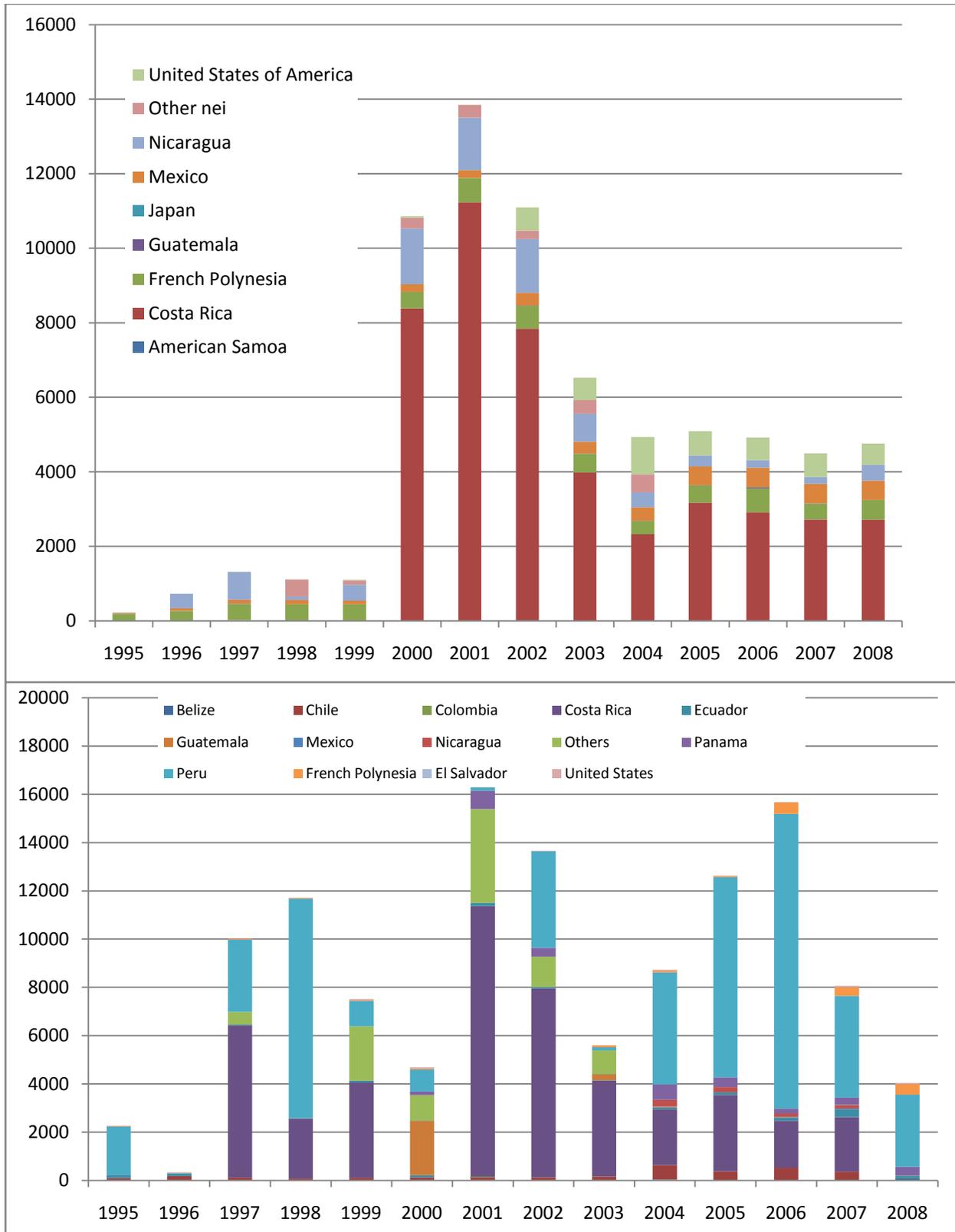


Figure 7. Dorodo catch (mt) in FAO Area 77 (top) and the Eastern Tropical Pacific (bottom).

### 3.1.1.5 Vulnerability Analyses to Inform Reclassification Decisions

Vulnerability analyses were conducted using the methods developed by the NMFS Vulnerability Evaluation Work Group (Patrick, *et al.* 2009). The vulnerability of a stock to becoming overfished is defined in the NSI guidelines as a function of its productivity (“the capacity of the stock to produce MSY and to recover if the population is depleted”) and its susceptibility to the fishery (“the potential for the stock to be impacted by the fishery, which includes direct captures, as well as indirect impacts to the fishery”). The guidelines note that the “vulnerability” of fish stocks should be considered when: 1) differentiating between stocks “in the fishery” and “ecosystem components”; 2) assembling and managing stock complexes; and 3) creating management control rules. The analysis uses a semi-quantitative method to rate both the productivity of the stock, based on life history characteristics, and the susceptibility of the stock to the fishery of interest based on catchability and the overall impact of the fishery to the stock and its habitat.

The HMSMT conducted analyses for the pelagic sharks, opah, and two west coast HMS target species for comparison (see Table 3-4). Susceptibility of these species to the DGN fishery which, with the exception of albacore, is the west coast HMS fishery catching these species in the greatest number, was examined.

The results demonstrate that the pelagic sharks have very low productivity and all species fall in a relatively narrow range of susceptibility to the DGN fishery. Sharks have slow growth, low fecundity, and a high trophic level contributing to a low overall productivity. Because all species are highly migratory and utilize a large portion of the water column including the depths at which the DGN fishes, and the large mesh DGN gear operates as an entangling net and captures a broad range of species, susceptibility differs among the species only by the extent to which they overlap with the fishery area (e.g. pelagic threshers are generally distributed farther south and are rarely taken in the fishery with the exception of during el Niño years), the relative distribution of the stock (e.g., common threshers in the EPO are distributed along the west coast of the U.S. and Baja California, Mexico, and not as widely ranging as the other species), or the value to the fishery (e.g., blue sharks are not desirable). The overall scores reflect some of these differences, but because the gillnet gear is not terribly selective, all can be considered somewhat susceptible. The vulnerability analysis alone may not help in determining whether reclassification is warranted. But in combination with the catch history, bigeye and pelagic threshers appear to be the least susceptible of the pelagic sharks to the DGN fishery. While the overall vulnerability score for opah is lower than for the pelagic sharks, there is also the greatest uncertainty about the species as indicated by the higher data quality scores. In addition, as stated above, opah catch has been relatively high and stable for the past 4 years. Observer records also indicate that nearly all opah are either landed or discarded dead.

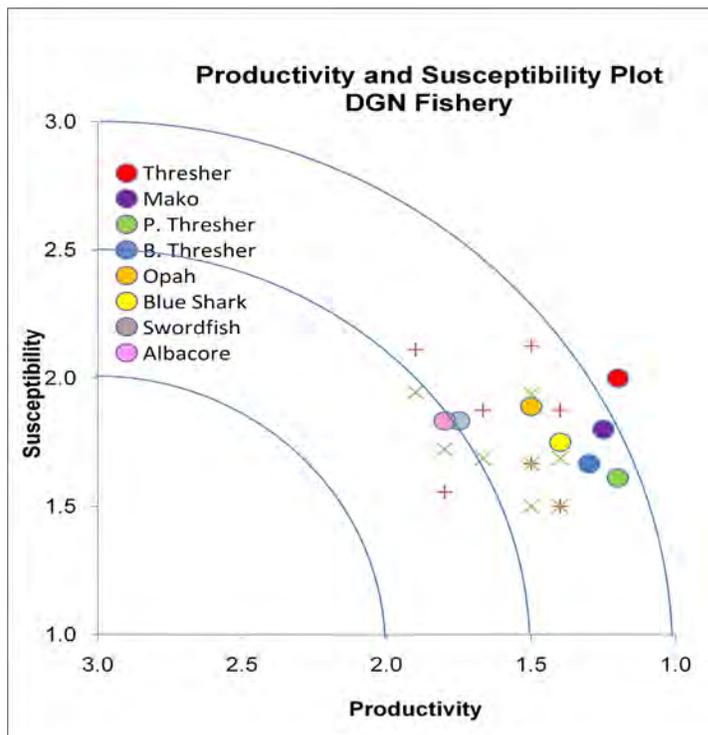
Figure 8 shows the productivity scores in a plot on two axes. Points further from the origin are more susceptible and/or less productive compared to points closer to the origin. The range of values for the same species for the Hawaii tuna (+) and Hawaii swordfish (×) longline fisheries are also shown for comparison in the figure.

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**Table 3-4. Results of the vulnerability analysis.**

PFMC DGN Fishery	Productivity		Susceptibility		Vulnerability
	Weighted Attribute Score	Weighted Data Quality Score	Weighted Attribute Score	Weighted Data Quality Score	
Common thresher	1.200	2.100	2.000	2.667	2.059
Shortfin mako	1.250	2.100	1.800	2.750	1.924
Pelagic thresher	1.200	2.200	1.611	3.167	1.901
Bigeye thresher	1.300	2.200	1.667	2.917	1.826
Blue shark	1.400	1.800	1.750	2.000	1.767
Opah	1.500	3.700	1.889	3.000	1.744
Swordfish	1.750	2.000	1.833	1.917	1.502
Albacore	1.800	2.200	1.833	1.750	1.461

Note: Productivity scores can range from 1 (low productivity and low susceptibility) to 3 (high productivity and high susceptibility). Data quality scores can range from 1 (best quality data) to 5 (no data). The resulting vulnerability score represents the straight line distance from the origin when productivity and susceptibility values are plotted as in Figure 8.



**Figure 8. Vulnerability plot for the species under consideration and two commercially important species (swordfish and albacore).**

### 3.1.2 Monitored Species in the HMS FMP

#### 3.1.2.1 Monitored Species for which Commercial or Recreational HMS Catch is Documented

Table 3-5 presents data on commercial landings, estimated recreational catch, and observed catch in the DGN fishery for HMS FMP monitored species for which catch or landings have been reported. Only

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five species show average annual commercial landings for this recent time period over 1 mt: Pacific bonito, opah, louvar, escolar, and bat ray.

Table 3-5 also shows the estimated catch in the California DGN fishery in numbers of fish, 2000-2008. Presenting catch in the DGN fishery is possible because it has had consistent observer coverage over the past decade. In addition, second to the albacore troll fishery, it is the largest commercial HMS fishery on the west coast. Troll, hook-and-line, purse seine, and harpoon fisheries have very low incidental catch rates. (Currently only a single vessel operates in the west coast deep-set pelagic longline fishery, another HMS fishery with higher bycatch rates, so catch information cannot be reported due to data confidentiality rules.)

Annual DGN catch estimates provided in Table 3-5 represent the observed catch, some of which may have been landed, and thus should not be considered additions to the landings data shown in the table. These estimates were developed from the observed catch DGN catch counts over the calendar years 2000 through 2008. For each species, the total observed catch over this period was divided by the number of years, nine, to obtain an average observed catch per year. This average was multiplied by the ratio of the total number of DGN sets fished over the 2000-2008 seasons (12,245) to the total number of observed sets over these seasons (2,457) to estimate the catch per year over the period. These data do not indicate post-release mortality; some species included in the table (e.g., common mola) are known to have a very high live discard rate, mitigating concerns about high estimated annual catch rates.

**Table 3-5. Monitored Species, commercial or recreational catch reported.**

Species	Other FMP Coverage	Average Annual Commercial Landings (mt) 2000-2008	Average Annual Recreational Dead Catch (mt) 2004-2008	Estimated Average Annual DGN Catch 2000-2008, no. fish
Pacific bonito, <i>Sarda chiliensis</i>		420.28	4.2	412
Opah, <i>Lampris guttatus</i>	WP Pelagics	37.56	0.1	997
Louvar, <i>Luvarus imperialis</i>		1.98	0.0	137
Escolar, <i>Lepidocybium flavobrunneum</i>	WP Pelagics	1.58	0.0	1
Bat ray, <i>Myliobatis californica</i>		1.43 <sup>‡</sup>	1.0	6
Leopard shark, <i>Triakis semifasciata</i>	P Groundfish	0.63	4.4	0
Pelagic stingray, <i>Pteroplatytrygon violacea</i>		0.33	0.0	80
Oilfish, <i>Ruvettus pretiosus</i>	WP Pelagics	0.26	0.0	5
Wahoo, <i>Athoxybium solandri</i>	WP Pelagics	0.26	0.0	0
Hammerhead sharks, Sphyrnidae	WP Pelagics	0.10	0.0	7
Pacific pomfret, <i>Brama japonica</i>	WP Pelagics	0.02	0.0	73
Black skipjack,* <i>Euthynnus lineatus</i>	WP Pelagics	0.02	0.5	0
Common mola, <i>Mola mola</i>		–	0.0	12,738
Salmon shark, <i>Lamna ditropis</i>	AK Groundfish	‡	0.0	15
Silky shark, <i>C. falciformis</i>	WP Pelagics	‡	0.0	0
Spiny dogfish, <i>Squalus acanthias</i>	AK & P Groundfish	–	0.1	0
Bullet mackerel (tuna), <i>Auxis rochei</i>	WP Pelagics	–	0.0	116

Sources:

PacFIN ft and ftl tables; only landings by HMS gear types.

Average annual RecFIN HMS A+B1 catch (dead catch) weight estimates in metric tons for private and rental.

Notes:

\*RecFIN does not separately report "black skipjack"; average for all skipjack catch is shown.

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<sup>y</sup>Although bat ray was landed with purse seine, a HMS gear, examination of species composition shows that the sets were made on CPS.

\*\*RecFIN does not appear to separately report the different thresher shark species; total thresher

‡ Excluded because less than 3 vessels made landings during the time period.

–No landing record for this time period.

Information on common mola, a high bycatch species, and monitored species with average annual commercial landings greater than 1 mt is presented below.

## Common Mola

Observer records from the DGN fishery show a high bycatch of common mola (ocean sunfish), generally exceeding target species catch (see Table 3-5). This species is almost universally discarded and observer information shows a very high proportion discarded alive, providing indication that bycatch mortality may be relatively low. Based on the criteria above, common mola seems to fit in the EC category.

The following information is from FishBase (www.fishbase.org, accessed July 1, 2010). Common mola, or ocean sunfish, has a worldwide distribution in warm and temperate waters. They are reported from slopes adjacent to deep water. They often drift at the surface laying on their side, although they have been observed at depths to 480 m. They are primarily planktivorous. Common mola is not a fisheries target and is generally considered inedible. It is considered to have low resilience and high vulnerability to fisheries.

## Pacific Bonito

Landings data show that of HMS gear types purse seine gear accounts for almost 99 percent of landings in the recent past (see Table 3-6). Examination of landings records for purse seine indicate that at the trip level Pacific bonito is exclusively targeted. They do not appear to be caught incidentally in purse seine sets on HMS FMP MUS such as yellowfin or bluefin tuna, which are opportunistically targeted in the SCB by coastal sieners. Of the remaining HMS gear types DGN accounts for most landings. Landings by other HMS gear types averaged slightly less than 3 mt per year 2000-2008.

**Table 3-6. Landings of Pacific bonito (mt) 2000-2008 by HMS gear types.**

Gear Type	2000	2001	2002	2003	2004	2005	2006	2007	2008	Total	Pct. of total
Drum purse seine	36.398	5.292	13.363		61.675	7.282	45.365	0.567	15.396	<b>185.338</b>	4.9%
Gill net, drift	1.055	0.085	1.076	0.518	0.685	0.033	3.841	0.324	4.452	<b>12.066</b>	0.3%
Hook and line	0.218	0.031	0.335	0.938	0.995	0.377	3.329	0.556	1.237	<b>8.018</b>	0.2%
Jig (albacore)	0.090	0.023	0.039	0.088	0.039		0.012		0.478	<b>0.770</b>	0.0%
Long line, set	0.001						0.055	2.417	0.007	<b>2.480</b>	0.1%
Purse seine	5.519		18.100		288.482	2.518	2435.608	217.230	603.253	<b>3570.711</b>	94.4%
Troll (albacore)	0.093	0.054	0.126				1.419		1.255	<b>2.947</b>	0.1%
Troll, (salmon)									0.216	<b>0.216</b>	0.0%
<b>Total</b>	<b>43.374</b>	<b>5.484</b>	<b>33.040</b>	<b>1.544</b>	<b>351.876</b>	<b>10.210</b>	<b>2489.630</b>	<b>221.094</b>	<b>626.293</b>	<b>3782.546</b>	100.0%

The following information is from Fishbase (www.fishbase.org, accessed July 1, 2010). Two subspecies are recognized from the eastern Pacific, *Sarda chiliensis chiliensis*, occurring in the South Pacific off Chile, and *S. c. lineolata*, occurring from Southeast Alaska to Baja California and the Revillagigedo Islands, Mexico, but are uncommon north of Point Conception, California. *S. c. lineolata* occurs inshore and feeds on small fish, shrimp, and cephalopods. Pacific bonito are a popular

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recreational target in Southern California. Anglers generally catch 1- to 4-year old fish, weighing between 3 and 12 pounds. They are seasonally available to anglers in the SCB during warmer months.

The State of California has a size limit for commercial landings of bonito. In general, the minimum size limit is 24 inches, except in round haul (purse seine) 18 percent or less of the haul may be below the minimum size limit and up to 1,000 pounds of Pacific bonito below the size limit may be landed when using gill or trammel nets. California also has a recreational bag limit (10 fish) and size limit (24 inches) for this species.

## Opah

As shown in Table 3-5, opah is second to Pacific bonito in terms of average annual landings. Table 3-7 shows that the DGN fishery accounts for the vast majority of opah landings. As seen in Figure 9, it appears that opah landings were declining through 2005 but in recent years have increased to about 60 mt per year. Figure 10 shows opah landings recorded for FAO Area 77. The U.S. accounts for most of the reported catch, averaging 361 mt per year, 1998-2008. However, Hawaii catch alone average 606 mt per year, 2005-2009, according to data reported by WPacFIN.<sup>12</sup> This implies substantial under-reporting in the FAO database. The IATTC data set does not report any opah landings, although this species is included in their database code list.

**Table 3-7. Opah landings by gear type, 1996-2009. (Source: PacFIN 3/2/10)**

<b>HMS Gear Type</b>	<b>Landings as percent of all opah landings with HMS gear</b>	<b>Vessels as percent of all HMS vessels with opah landings</b>
Surface hook-and-line	0.4%	4.2%
Drift gillnet	92.7%	86.0%
Harpoon	0.1%	0.9%
Longline	6.8%	8.6%
Purse seine	<0.1%	0.2%

<sup>12</sup> [http://www.pifsc.noaa.gov/wpacfin/hi/dar/Pages/hi\\_data\\_menu.php](http://www.pifsc.noaa.gov/wpacfin/hi/dar/Pages/hi_data_menu.php)

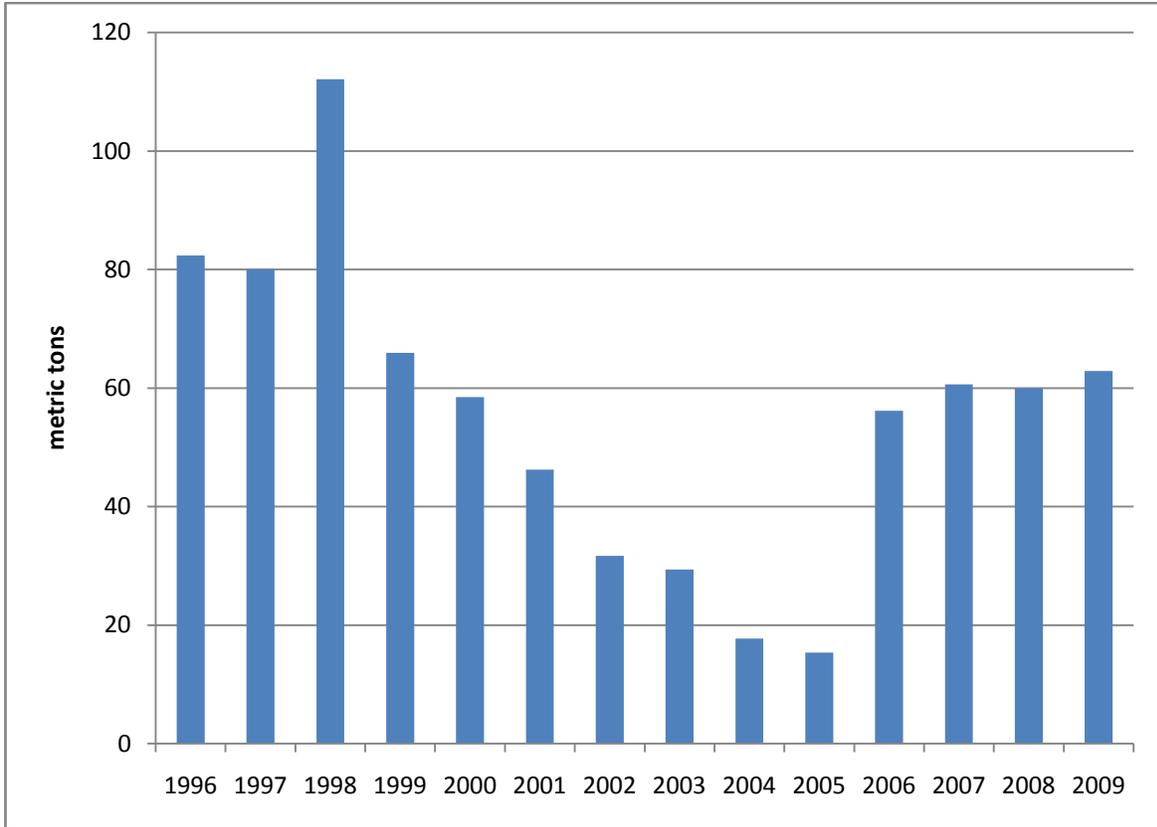
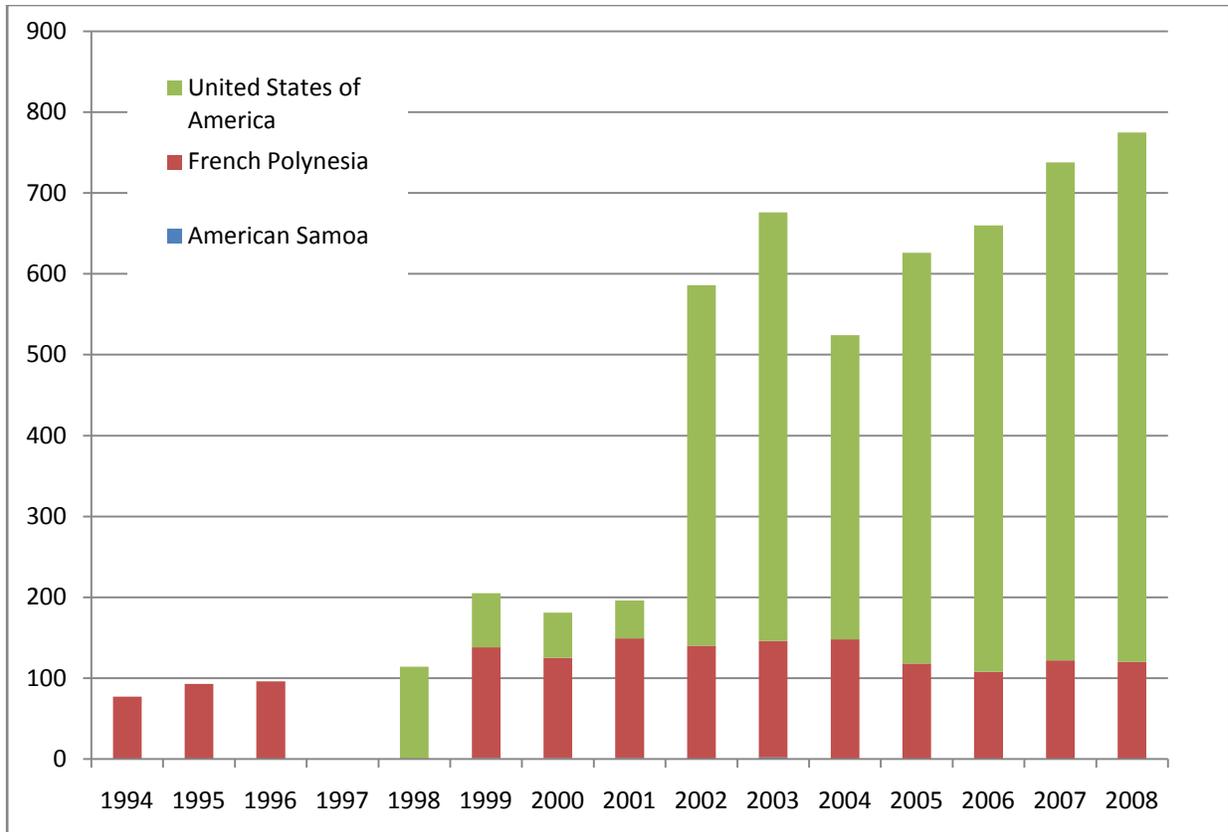


Figure 9. Landings of opah with HMS gear types, 1996-2009. (Source PacFIN 2/26/10)



**Figure 10. Opah landings in FAO Area 77 (Source: FishStat Plus)**

According to Fishbase, opah has a worldwide distribution in tropical and temperate waters. It is solitary in habit, inhabiting epi- and mesopelagic waters. It feeds on invertebrates, mainly squids. Opah is commercially valuable as indicated by PacFIN landing records.

There are no state regulations specific to opah, although generally commercial and recreational licensing and other general measures would apply.

**Louvar**

As shown in Table 3-5 west coast landings of louvar averaged just under 2 mt per year, 2000-2008. Louvar catches are not reported in either the FAO or IATTC databases.

According to Fishbase louvar are found in tropical and temperate waters in the Atlantic and Pacific Oceans and the Mediterranean Sea. It is epipelagic, found near the surface in deep waters. It feeds mainly on jellyfishes, ctenophores, and other gelatinous planktonic animals.

**Escolar**

As shown in Table 3-5 west coast landings of escolar averaged about 1.6 mt per year, 2000-2008. FAO Area 77 catches are reported for the U.S. and since 2005 French Polynesia. Since 2005 U.S. Area 77 catch has averaged 3.25 mt per year while French Polynesia catch has averaged 27 mt per year.

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Fishbase reports its distribution as tropical and temperate waters worldwide but probably not the Indian Ocean, occurring over the continental slope down to 200 m and more.

### Bat Ray

Examination of landings data shows that bat rays were landed by purse seine (an HMS gear) vessels targeting non-HMS species, so these landings should be discounted in terms of susceptibility to HMS fisheries.

According to Fishbase the bat ray is reported only in the Eastern Pacific from Oregon to the Galapagos Islands. It is a coastal species commonly found in sandy and muddy bays and sloughs, also on rocky bottom and in kelp beds.

#### 3.1.2.2 Monitored Species for which Commercial HMS Landings or Appreciable Bycatch is not Reported

Table 3-8 shows the remaining monitored species for which commercial or recreational landings were not recorded, nor were they encountered in DGN fishery observer records.

**Table 3-8. Monitored species for which commercial (2000-2008) or recreational (2004-2008) catch was not reported for HMS gears.**

Species	Other FMP Coverage	Note on PacFIN data
Black marlin, <i>Makaira indica</i>	WP Pelagics	Species not separately identified in PacFIN
Blacktip shark, <i>Carcharhinus limbatus</i>		No landing record for this time period
Blue marlin, <i>Makaira nigricans</i>	WP Pelagics	No landing record for this time period
Dusky shark, <i>C. obscurus</i>		No landing record for this time period
Lancetfishes, Alepisauridae		No landing record for this time period
Manta/Mobula rays, Mobulidae		Species not separately identified in PacFIN
Oarfish, <i>Regalecus glesne</i>		Species not separately identified in PacFIN
Oceanic whitetip shark, <i>C. longimanus</i>	WP Pelagics	Species not separately identified in PacFIN
Pacific moonfish, <i>Selene peruviana</i>		Species not separately identified in PacFIN
Pacific sailfish, <i>Istiophorus platypterus</i>	WP Pelagics	No landing record for this time period
Pacific saury, <i>Cololabis saira</i>		No landing record for this time period
Prickly shark, <i>Echinorhinus cookei</i>		Species not separately identified in PacFIN
Rainbow runner, <i>Elagetic bipinnulata</i>		Species not separately identified in PacFIN
Shortbill spearfish, <i>Tetrapturus angustirostris</i>	WP Pelagics	Species not separately identified in PacFIN
Six gill shark, <i>Hexanchus riseus</i>	AK Groundfish	No landing record for this time period
Southern shark, <i>Galeorhinus galeus</i>	AK & P Groundfish	No landing record for this time period
Whale shark, <i>Rincodon typus</i>		Species not separately identified in PacFIN

Sources:

PacFIN fit and fit tables; only landings by HMS gear types.

Average annual RecFIN HMS A+B1 catch (dead catch) weight estimates in metric tons for private and rental.

### 3.2 Protected Species and Essential Fish Habitat

Other components of the ecosystem that may be affected by HMS fisheries are protected species and essential fish habitat. Chapter 6 in the HMS FMP FEIS (PFMC 2003) describes protected species

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interactions in west coast HMS fisheries. On February 4, 2004, NMFS published a Biological Opinion for the HMS FMP pursuant to Section 7 of the ESA (NMFS 2004). Information on protected species in these documents is incorporated by reference. Table 3-9 lists protected species occurring in the action area (areas in which west coast HMS fisheries occur). In addition to the species listed in the table, various population segments of salmonids (chum, coho, Chinook, and sockeye salmon; steelhead) are listed as threatened or endangered under the ESA. The HMS FMP lists Pacific salmon species as prohibited species in HMS fisheries, meaning they cannot be retained.

**Table 3-9. Protected species occurring in the action area and ESA status (E = endangered, T = threatened, CH = critical habitat designated). (Source: PFMC 2003, Chapter 6)**

Common Name	Scientific Name	ESA Status
<b>Marine Mammals</b>		
Baird's beaked whale	<i>Berardius bairdii</i>	
Blue whale	<i>Balaenoptera musculus</i>	E
Bottlenose dolphin	<i>Tursiops truncatus</i>	
Bryde's whale	<i>Balaenoptera edeni</i>	
California sea lion	<i>Zalophus californianus californianus</i>	
Cuvier's beaked whale	<i>Ziphius cavirostris</i>	
Dall's porpoise	<i>Phocoenoides dalli</i>	
Fin whale	<i>Balaenoptera physalus</i>	E
Guadalupe fur seal	<i>Arctocephalus townsendi</i>	E
Harbor porpoise	<i>Phocoena phocoena</i>	
Harbor seal	<i>Phoca vitulina richardsi</i>	
Humpback whale	<i>Megaptera navaeangliae</i>	E
Killer whale	<i>Orcinus orca</i>	
Long-beaked common dolphin	<i>Delphinus capensis</i>	
Minke whale	<i>Balaenoptera acutorostrata</i>	
North Pacific right whale	<i>Eubalaena glacialis</i>	E
Northern elephant seal	<i>Mirounga angustirostris</i>	
Northern fur seal	<i>Callorhinus ursinus</i>	
Northern right-whale dolphin	<i>Lissodelphis borealis</i>	
Pacific white-sided dolphin	<i>Lagenorhynchus obliquidens</i>	
Pygmy sperm whale	<i>Kogia breviceps</i>	
Risso's dolphin	<i>Grampus griseus</i>	E
Sei whale	<i>Balaenoptera borealis</i>	
Short-beaked common dolphin	<i>Delphinus delphis</i>	
Short-finned pilot whale	<i>Globicephala macrorhynchus</i>	
Sperm whale	<i>Physeter macrocephalus</i>	E
Steller (=northern) sea lion	<i>Eumetopias jubatus</i>	CH,T
Southern sea otter	<i>Enhydra lutris nereis</i>	T
Striped dolphin	<i>Stenella coeruleoalba</i>	
<b>Sea Turtles</b>		
Green sea turtle	<i>Chelonia mydas</i>	T

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Leatherback sea turtle	<i>Dermochelys coriacea</i>	CH, E
Loggerhead sea turtle	<i>Caretta caretta</i>	T
Olive (=Pacific) ridley sea turtle	<i>Lepidochelys olivacea</i>	T
<b>Birds</b>		
Short-tailed albatross	<i>Phoebastria albatrus</i>	E
Bald eagle	<i>Haliaeetus leucocephalus</i>	T
Brown pelican	<i>Pelecanus occidentalis</i>	E
California least tern	<i>Sterna antillarum browni</i>	E
Western snowy plover	<i>Charadrius alexandrinus</i>	T
Marbled murrelet	<i>Brachyramphus marmoratus</i>	CH, T
California clapper rail	<i>Rallus longirostris obsoletus</i>	E
<b>Invertebrates</b>		
White abalone	<i>Haliotis sorenseni</i>	E

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Most protected species interactions have occurred in the DGN fishery. Mitigation measures have been implemented in the DGN fishery pursuant to the Marine Mammal Protection Act (MMPA) and the ESA as described in Section 6.1 of the HMS FMP FEIS (PFMC 2003). Pursuant to the MMPA, the DGN fishery has been categorized as a Category I fishery in the annual List of Fisheries published in the Federal Register, meaning that it is a fishery with frequent serious injury or mortality to marine mammals. However, the 2011 List of Fisheries (75 FR 68468) places this fishery in Category III, meaning a remote likelihood or no known incidental mortality and serious injuries of marine mammals. The Pacific Offshore Take Reduction Team was formed in 1996 to address incidental mortality and serious injury to marine mammals in the DGN fishery. Final regulations implementing their Take Reduction Plan were implemented in 1996. In 2000 NMFS issued a permit for the fishery pursuant to the MMPA to allow incidental but not intentional take of four marine mammal stocks: CA/OR/WA fin whale stock, CA/OR/WA and Mexico humpback whale stock, Steller sea lion eastern stock, and CA/OR/WA sperm whale stock. NMFS annually prepares Stock Assessment Reports, which provide information on population status and estimates of mortality and serious injury from fisheries.<sup>13</sup> The DGN fishery has also been the subject of Section 7 consultations under the ESA.

A 2000 biological opinion addressed take of listed species in the DGN fishery, and found the fishery was likely to jeopardize the continued existence of loggerhead and leatherback sea turtles. In response the Pacific Leatherback Conservation Area was implemented to reduce the take. The aforementioned gear modifications to address marine mammal take may also reduce sea turtle takes. The biological opinion included an incidental take statement which, if exceeded, would be a basis for reinitiating consultations. To date, estimated take in the fishery has not exceeded these levels.

Prior to implementation of the FMP there was an active west coast longline fishery targeting swordfish, but this fishery was closed because of the incidental take of loggerhead sea turtles pursuant to the ESA Section 7 consultation for the HMS FMP. Currently, a single vessel targets tuna with longline gear from the west coast. This vessel is subject to 100 percent observer coverage. Due to confidentiality requirements of the MSA, protected species interactions cannot be reported for this vessel. Historical information on the historical west coast longline fishery (NMFS 2004; PFMC 2003) focuses on the—now prohibited—shallow-set (swordfish) longline fishery, because at that time a deep-set (tuna) fishery from the west coast was not considered viable and there were no active participants. The shallow-set fishery generally has more takes of sea turtles, principally loggerhead and leatherbacks, compared to the deep-set fishery, so the information presented in these sources is not directly applicable to the current single vessel deep-set fishery. NMFS has prepared an EA and Biological Opinion for the deep-set fishery, which provides more specific information on the effects.

<sup>13</sup> See <http://www.nmfs.noaa.gov/pr/sars/>

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Section 6.1.3 in the HMS FMP FEIS describes seabird interactions in HMS fisheries. Seabird takes are well-documented in the DGN fishery, because of the 20 percent observer coverage level, but not well-documented in other HMS fisheries. Seabird takes have been modest in the DGN fishery. Seabird takes are of greater concern in longline fisheries, because seabirds dive at baited hooks as they are deployed from the vessel. The birds can become hooked or entangled and dragged underwater to drown. The principal species of concern are the black-footed albatross (*Phoebastria nigripes*), the Laysan albatross (*P. immutabilis*), and the short-tailed albatross (*P. albatrus*). The short-tailed albatross is listed as endangered under the ESA and has a very small population, although it is growing. Short-tailed albatross are rarely encountered in the eastern Pacific but may become more common if their population size increases. In 2009 the United States Fish and Wildlife Service (USFWS) solicited information on a petition to list black-footed albatross under the ESA. The comment period closed September 25, 2009. Regulations pursuant to the HMS FMP at 50 CFR 712(c) require a variety of mitigation measures for longline vessels to reduce seabird hooking and entanglement.

On January 5, 2010, NMFS published a proposed rule to designate critical habitat in the U.S. west coast EEZ for the endangered leatherback sea turtle. The proposed designation covers two adjacent marine areas stretching along the California coast from Point Arena to Point Vicente; and one area stretching from Cape Flattery, Washington to the Umpqua River (Winchester Bay), Oregon east of a line approximating the 2,000 meter depth contour, comprising approximately 70,600 square miles of marine habitat. A final rule implementing this proposal has not yet been published.

The HMS FMP FEIS also discusses the endangered short-tailed albatross as a species of concern. No takes of short-tailed albatross have been documented in the fisheries managed under the HMS FMP.

Chapter 4 of the HMS FMP FEIS describes essential fish habitat (EFH) for managed species. HMS fisheries interact with pelagic habitat without contacting the ocean floor. Benthic habitat, especially biogenic features, are vulnerable to adverse impacts from fishing, but pelagic habitat is not directly affected by fishing gear. The FEIS notes that lost gear and other discarded items may have some adverse impact on pelagic habitat but there is insufficient information to determine the magnitude of west coast fisheries' contribution to this adverse impact.

### 3.3 Socioeconomic Environment

Chapter 2 of the HMS FMP FEIS describes baseline socioeconomic conditions of west coast HMS fisheries and fishing communities. HMS SAFE documents provide updated information on landings and revenue.

During the 2004-2008 period, total ex-vessel revenue from commercial HMS species landings on the west coast averaged \$28.4 million. In terms of "management group" (a PacFIN category for PFMC FMPs plus other major state-managed species), HMS ranked third, at 9 percent, behind Dungeness crab (31 percent) and groundfish (26 percent) in terms of total coastwide revenue, 2005-2009. Figure 11 shows the species composition of this revenue; albacore accounted for the vast majority at 86 percent, followed by swordfish at 11 percent. Figure 12 shows the distribution of HMS ex-vessel revenue by state for 2005-2009. Washington accounted for the largest proportion of revenue, followed by Oregon and then California. Data from Tables 4-56 through 4-58 in the 2009 HMS SAFE show that on average 257 albacore surface hook-and-line vessels per year made landings in Washington, 390 in Oregon, and 118 in California. It is important to note that for albacore, the state in which the fish was landed may not be the same state as the home port for a particular vessel since vessels may follow the fish as they seasonally migrate up the coast. Virtually all the landings by other HMS gear types occurred in California.

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Albacore is also an important recreational species on the west coast. In Washington and Oregon this is virtually the only recreational HMS species caught. Figure 13 shows the species composition of recreational catches in California by CPFV and private anglers. While albacore is dominant, other tunas (notably bluefin) and dorado can make up also significant portions of the overall catch in any given year depending on availability, which is in part determined by prevailing climactic and oceanographic conditions.

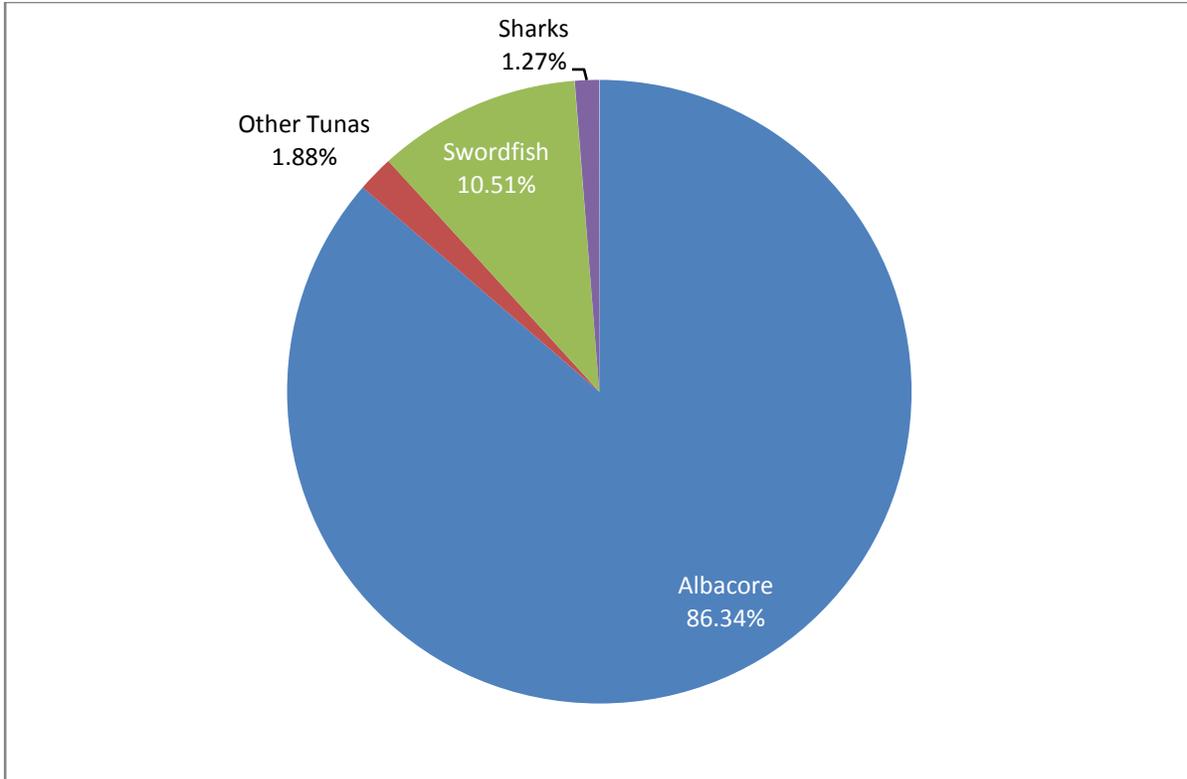


Figure 11. Species composition of west coast HMS revenue, 2004-2008. (Source: 2009 HMS SAFE, Table 4-8)

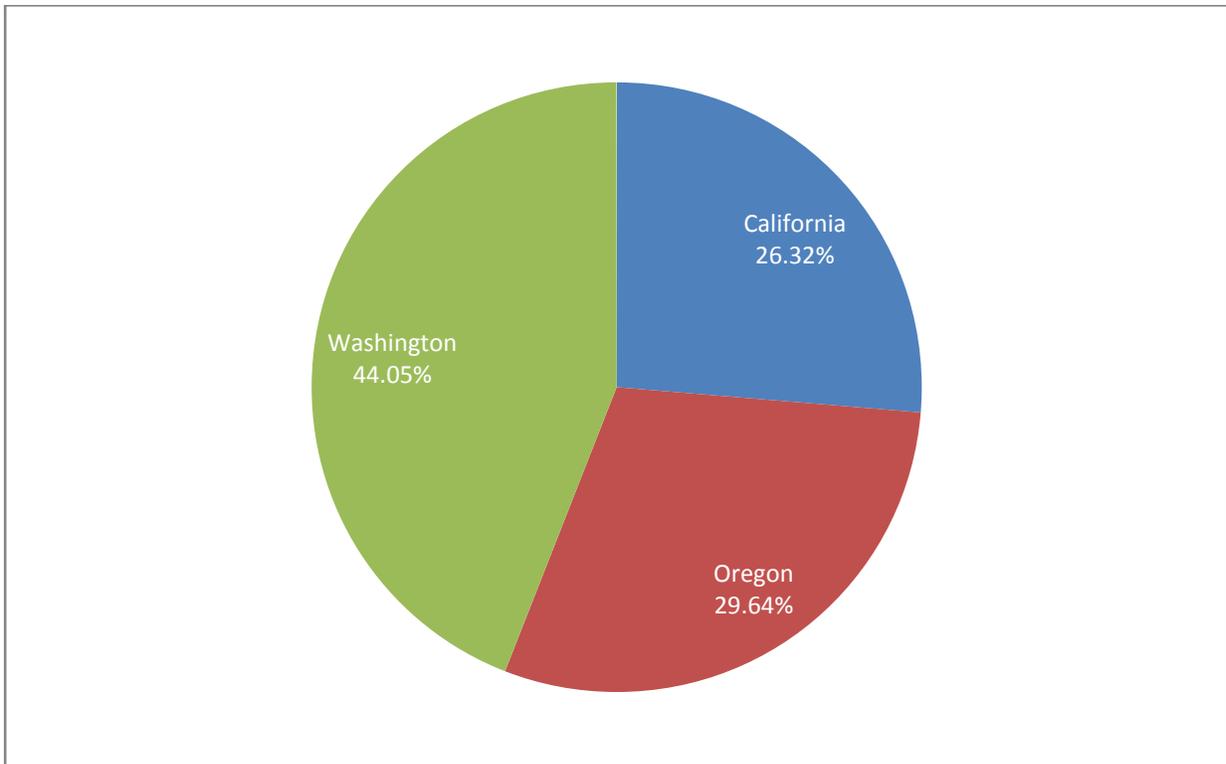
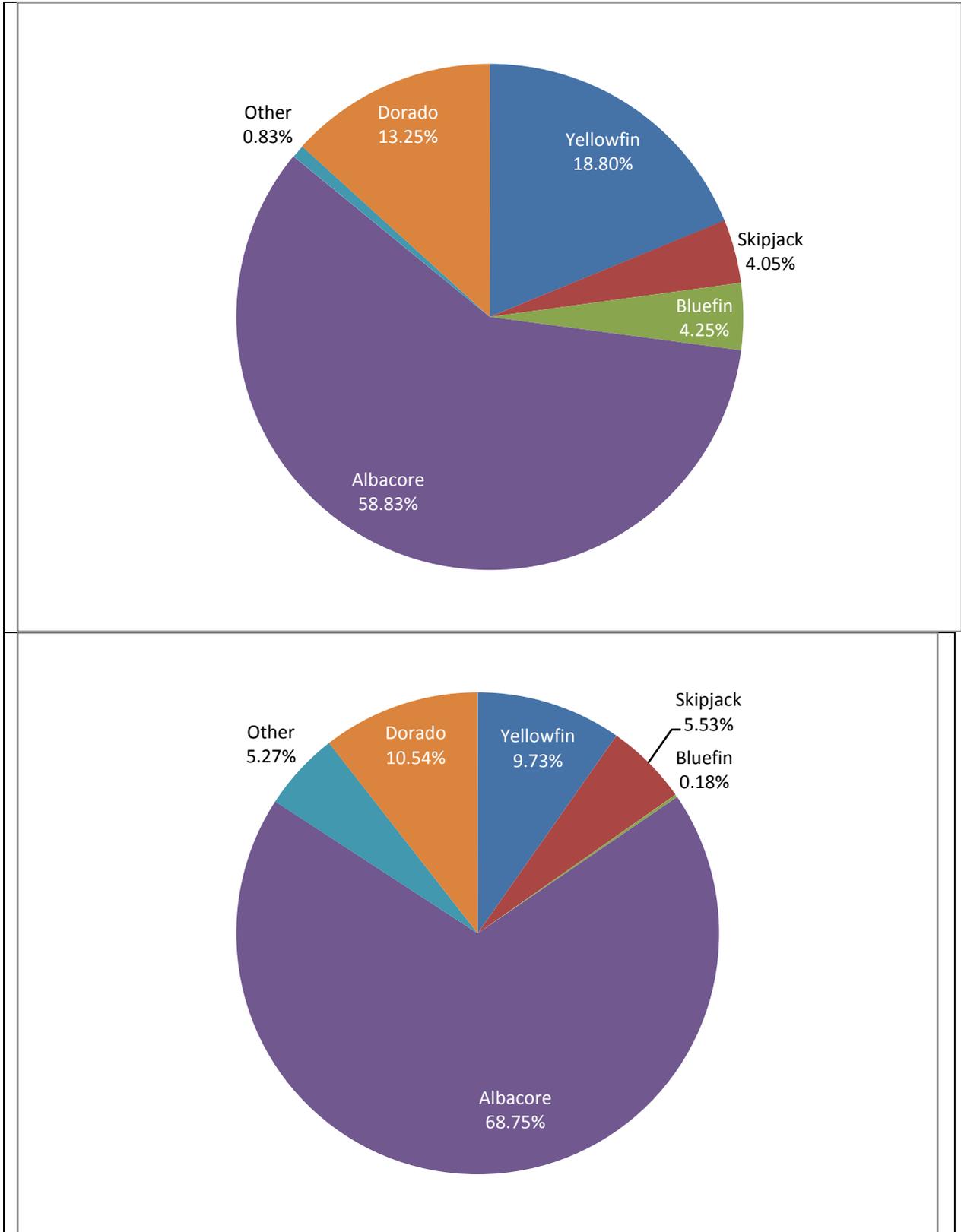


Figure 12. Ex-vessel revenue from HMS distribution by state, 2005-2009. (Source: PacFIN vessel summary files)



**Figure 13. Composition of recreational catch by CPFV in California waters (top) and private anglers (bottom), 2004-2008. (Source: 2009 HMS SAFE Tables 4-60 and 4-64a).**



## CHAPTER 4 EFFECTS OF THE ALTERNATIVES

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Sections 4.1 through 4.3 discuss direct and indirect impacts of the alternatives. Direct effects are directly related to the action (occurring at the same time and place); for indirect effects there is some intermediate cause-and-effect between the proposed action and the actual effect being evaluated (occurring at a distance in time and/or place). Section 4.4 describes the cumulative effects of the alternatives.

### 4.1 Direct and Indirect Impacts to Managed Species

Impacts to managed species may be evaluated with respect to stock status. Stock status refers to the assessment of current fishing mortality rates and stock biomass in relation to commonly accepted biological reference points. However, such an assessment may be confounded because there is insufficient information to estimate fishing mortality, or stock biomass or scientific consensus on appropriate reference points may not exist. Under the MSA, a formal determination of stock status with respect to overfishing and overfished condition may be made, depending both on the scientific information available and the associated scientific uncertainty. From a policy perspective, stock status is usually assessed with respect to OY. The HMS FMP sets OY equal to MSY for stocks not considered vulnerable and 0.75MSY for vulnerable stocks (bluefin tuna, striped marlin, and pelagic sharks).

#### 4.1.1 No Action

Section 3.1 describes the current status of stocks managed under the HMS FMP and provides a summary of the relative proportions of west coast HMS landings compared to regional HMS landings. For tunas and billfish, U.S. west coast fisheries account for a small fraction of overall catch ranging from 0.01 percent (tropical tunas, striped marlin) to 17 percent or less (North Pacific albacore) (Table 5-3 in the HMS SAFE document containing this information is reproduced as Table 2-7). Because stockwide catches of managed shark species are poorly documented, it is not possible to estimate the west coast fraction, but it is likely of a similar magnitude as the other managed species, with the possible exception of common thresher shark. Stock status is primarily a function of catches from fisheries prosecuted by many different nations in international waters that are not managed under the HMS FMP. These fisheries are managed through two RFMOs in the Pacific, the IATTC and the WCPFC.

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The management framework for determining stock reference points currently in the FMP is not expected to have direct or indirect impacts on stock status. No specific catch controls are established under the proposed action. Furthermore, stock status is primarily affected by foreign fisheries that are not managed under the HMS FMP.

Table 5-2 in the annual HMS SAFE document summarizes the status of stocks:

- Bigeye tuna (WCPO and EPO) and yellowfin (EPO) are subject to overfishing
- Skipjack tuna (WCPO and EPO), yellowfin tuna (WCPO), striped marlin (EPO), swordfish (Northeast Pacific Ocean and NWPO), common thresher, shortfin mako, and blue shark are not subject to overfishing
- The status of albacore (NPO), bluefin (NPO), striped marlin (NPO), pelagic thresher, bigeye thresher, and dorado is unknown; however, there is concern about the current exploitation levels for the North Pacific stocks of albacore, bluefin, and striped marlin, while the best available scientific information suggests that overfishing is not occurring on pelagic and bigeye thresher sharks and dorado

For stocks where status is known, no stocks are considered overfished.

The HMS FMP lists 34 monitored species, which are not subject to management. Because they are not managed, the No Action alternative does not have any direct or indirect impacts on these species.

#### 4.1.1.1 Alternatives 2-5 (Action Alternatives Including the Council-preferred Alternative)

The action alternatives, including the Council-preferred alternatives will not directly or indirectly affect managed species for the same reasons that the No Action Alternative has no direct and indirect effects. The action alternatives would make changes to the HMS FMP so that it better complies with revised NSI Guidelines but does not implement any management measures that would affect managed stocks.

Alternatives 4 and 5 would move pelagic and bigeye thresher shark from the managed category to the EC category. These two species would no longer be managed under the HMS FMP. However, there are no regulations specifically applicable to these two species, so this change in status would have no direct or indirect impacts on these species in terms of management measures affecting stock status. Alternatives 3 and 4 would make opah a managed species. For the same reason as above, this action would have no direct or indirect effects, because no management measures are proposed.

The action alternatives would designate between 8 and 34 EC species (see Table 2-6). However, these species are not subject to management so no direct or indirect impacts would occur.

## 4.2 Direct and Indirect Impacts on Protected Species and Essential Fish Habitat

Section 3.2 summarizes the effects of HMS fisheries on protected species, incorporating reference material from HMS FMP FEIS (PFMC 2003) and the Biological Opinion for the FMP (NMFS 2004). Section 3.2 in the HMS SAFE document summarizes current information on protected species issues in HMS fisheries.

Protected species will not be directly or indirectly affected by the alternatives, because the alternatives do not affect the spatial distribution or intensity of fishing activities. Protected species interactions are a function of the timing and location managed fisheries, which may be affected by management measures implemented pursuant to the HMS FMP or other applicable law, such as the MMPA and ESA.

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Therefore, the magnitude of effects described in the documents referenced above are likely to continue under any of the alternatives.

No direct or indirect impacts to EFH are expected under any of the alternatives, because the alternatives do not affect the spatial distribution or intensity of fishing activities. Furthermore, as discussed in Section 3.2, HMS fisheries have limited effects on pelagic EFH, mainly resulting from lost gear and other materials discarded from fishing vessels. Therefore, the same type and magnitude of effects would be expected under the alternatives as those described in Section 3.2.

### **4.3 Direct and Indirect Socioeconomic Impacts**

The proposed action is not expected to have any direct or indirect socioeconomic impacts, because harvest limits and management measures influencing ex-vessel revenue and personal income are not established under the range of alternatives considered. Instead, the proposed action amends the FMP to revise the framework used in developing management reference points. Under the Council-preferred alternative (Alternative 5) the current biennial management process could be used for the Council to formally consider changes to management reference points along with any necessary management measures. Through this process, catch controls that would have direct or indirect impacts could be implemented. Since this is separate from the proposed action, these effects are considered under the next section on cumulative effects.

### **4.4 Cumulative Effects**

To determine the cumulative effects on an environmental component, the effects of ongoing baseline conditions (described in Chapter 3), reasonably foreseeable future actions, and direct/indirect effects of the proposed action (Sections 4.1-4.3) are considered for their overall effect on an environmental component. As discussed in Sections 4.1 through 4.3, no direct or indirect impacts have been identified under the range of alternatives.

The next section, below, summarizes the “external actions” and “ongoing trends” that contribute to the effects of the proposed action under the different alternatives to produce a cumulative effect. These actions and trends represent the past, present, and reasonably foreseeable future actions that add to the effect of the proposed action.

#### **4.4.1 External Actions and Ongoing Trends**

Actions are defined as regulatory and programmatic activities affecting the operational environment for FMP-managed fisheries and the status of related resources. Trends are ongoing changes in baseline conditions that have occurred and may be reasonably expected to continue; these trends can be shaped by either environmental forces (e.g., climate forcing affecting animal populations) or human behavior in the aggregate (e.g., consumption patterns). This information supports the evaluation of cumulative effects in Section 4.4.2. In identifying external actions that may combine with the effects of the proposed action, it is important to consider their temporal aspect. An action may have occurred at some discrete time in the past but resulted in a permanent change in baseline conditions. Alternatively, an action that was initiated in the past may be continuing; this is common for the types of programmatic actions that have the greatest effect on the management system and managed resources. So, although CEQ regulations reference “past, present, and reasonably foreseeable future actions,” from an analytical standpoint, what is of interest is the net effect on baseline conditions prior to implementation of this action (FMP Amendment 2 and any pursuant regulations) and any ongoing effects of these actions because they continue to exist programmatically. While the direct and indirect impacts of the proposed

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action may be confined to changes to the management framework with respect to which species are actively managed and the framework for establishing management controls, cumulative effects result from the application of this framework and its interaction with other activities.

### External Actions:

- Stock assessments: Stock assessments are prepared under the auspices of Pacific RFMOs for most HMS FMP MUS. NMFS scientists may prepare some stock assessments and assist with some RFMO stock assessments. Stock assessments provide information on stock status and are the basis for developing conservation measures.
- Conservation measures established by RFMOs: The WCPFC and IATTC adopt measures by consensus, which are then implemented by the members of these organizations through domestic law.
- Harvest specifications and management measures established through the HMS FMP biennial process: The biennial process has been discussed above in relation to direct and indirect effects but may be considered external to the proposed action. This process may be used to set catch limits relative to conservation objectives (e.g., OY) and related management measures.
- Protected species measures: Other applicable law (ESA, MMPA, and others, see Chapter 6) addresses incidental take of protected species in HMS FMP fisheries. These measures also indirectly affect fishing opportunity and thus target species harvests.

### Ongoing Trends:

- Change in the use of ocean areas: Habitat protection measures (e.g., MPAs) and offshore projects (e.g., wind and wave power, offshore aquaculture) limiting the area open to fisheries.
- Changes to coastal economies and land use: population increase in coastal areas and related growth in nonfishery-related economic activities and land use.
- Increased demand for protein affecting real prices: Population growth and rising living standards globally is likely to increase demand for fishery products. This could lead to price increases unless aquaculture increases supply at lower cost than wild-caught fish (and consumers consider the two products substitutable).
- Increased consumer awareness affecting purchasing decisions: Certification and consumer awareness programs may affect buying decisions. Consumers may become more aware of or form opinions about how effectively a fishery is managed both in terms of the status of target stocks and the effect of a particular fishery on other resources (e.g., protected species). Consumer awareness may have a marginal effect on demand for specific products (based on source) over the long term.
- Changes in stock status of exploited species: Stock status is a function of fishing mortality and other, non-anthropogenic (“natural”) sources of mortality such as climate forcing effects on stock recruitment and stock productivity, and trophic effects on growth and mortality. Foreign fisheries are the dominant source of fishing mortality for most HMS FMP MUS. NMFS has declared two HMS FMP MUS stocks, bigeye tuna Pacific-wide and EPO yellowfin tuna, subject to overfishing. This required Council responses pursuant to MSA provisions.
- Changes in stock status of protected species: Additional species may be listed under the ESA (e.g., black-footed albatross) or changed from threatened to endangered status, which could result in additional mitigation measures for HMS fisheries pursuant to Section 7 consultations. Under the MMPA, revised estimates of a stock’s potential biological removal (PBR) could prompt mitigation measures for HMS fisheries. Conversely, if a population recovers it may be de-listed, allowing changes to mitigation measures.
- Cyclical and ongoing climate change will affect stock productivity in the northeast Pacific: Cyclical events (ENSO, PDO) and long-term climate change affects the relative productivity of different marine organisms with attendant ecosystem effects.

#### **4.4.2 Description of the Cumulative Effects of the Action**

##### **4.4.2.1 Managed Species**

The purpose of the proposed action, in addressing revised NSI Guidelines, is to prevent overfishing and manage stocks to OY. Stock assessments provide information on the status of the stock. HMS FMP MUS stock status is strongly influenced by foreign fishing. The level of foreign and domestic fishing is partly a function of changes in global demand for fishery products. Conservation measures adopted by Pacific RFMOs are intended to manage fisheries against explicit or implicit targets or limits, e.g.,  $F_{MSY}$ , but are not always effective. The proposed action would be primarily implemented through the existing biennial process during which current reference points, including OY, would be evaluated and adjusted if needed. Harvest limits and related management measures could be implemented to address the relative impact of west coast fisheries. The Council may also make recommendations relative to ending international fishing.

Overfishing is the principal cumulative adverse impact to managed HMS stocks. Two managed HMS stocks, bigeye tuna (Pacific-wide) and EPO yellowfin tuna have been declared subject to overfishing pursuant to the MSA. Current levels of fishing mortality for North Pacific albacore, North Pacific bluefin tuna, and North Pacific striped marlin may exceed commonly excepted biological reference points and these stocks may be subject to overfishing, although no formal declaration has been made pursuant to the MSA. As already discussed, overfishing is principally caused by foreign fisheries not managed under the HMS FMP and not affected by the proposed action.

##### **4.4.2.2 Protected Species and Essential Fish Habitat**

Protected species impacts are primarily addressed through the ESA, MMPA, and other applicable law. Most HMS fisheries have minimal interactions with protected species, the exception being the California DGN fishery and the pelagic longline fishery. In these two fisheries a variety of mitigation measures have been implemented to reduce the incidental take of marine mammals, ESA-listed sea turtles, and seabirds. Section 3.2 describes the affected species and types of effects.

Pelagic EFH is generally unaffected by fishing authorized under the HMS FMP. Lost fishing gear and other debris are identified as principal adverse impacts, with other fisheries and ocean activities as the source.

Management measures implemented through the biennial process, intended to achieve OY (consistent with the harvest specifications framework of the proposed action), could indirectly affect the spatio-temporal distribution of fishing effort. This in turn affects the likelihood of protected species interactions. However, no changes in management measures affecting protected species are currently proposed.

The action alternatives are unlikely to differ from No Action in terms of effects. The types and intensity of effects described in Section 3.2 are likely to continue in the future under any of the alternatives.

##### **4.4.2.3 Socioeconomic Environment**

Coastal communities are affected by ex-vessel revenue due to commercial fishery landings. Recreational fisheries provide both market and non-market benefits. Catches and landings may be affected by changes in the status of the resource and management measures that may constrain

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commercial and recreational fishing opportunity. In addition, commercial and recreational fisheries are often an important part of a community's social and touristic identity. Coastal development can compete with existing fisheries' infrastructure for waterfront access and real estate. This is especially true in urbanized areas such as the San Francisco Bay Area and Southern California, areas where commercial and recreational HMS fisheries are important.

As already mentioned, the harvest specifications framework in the FMP is applied through the biennial process and the Council's role in making recommendations for action at the international level. Since FMP implementation, the Council has not recommended any new commercial management measures, nor have they established new harvest guidelines (or other catch limits), or adjusted the two harvest guidelines established by the FMP. RFMO conservation measures also have not yet required additional domestic regulations for west coast commercial HMS fisheries, mainly because the relative impact of these fisheries on the stocks concerned is negligible. In 2007 the IATTC and WCPFC adopted conservation measures calling for no increase in fishing effort on North Pacific albacore. In 2010 the Council considered establishing a limited entry program for the west coast albacore fishery, partly in response to these conservation measures, but deferred further action until the results of the next stock assessment become available. As noted above, new recreational bag limits for albacore in California were implemented in 2007 but likely had negligible socioeconomic impacts, because most recreational catches are below the bag limit. In 2010 the Council considered, but did not adopt, recreational bag limits for Washington recreational fisheries on albacore.

Depending on the results of the next North Pacific albacore stock assessment, Pacific RFMOs could adopt conservation measures with more specific requirements than in the current conservation measures (e.g., establishing quantitative effort limits, national quotas, other direct catch control requirements), requiring Council action to constrain the west coast albacore fishery.

The action alternatives are unlikely to differ substantially from No Action in terms of cumulative socioeconomic impacts. Under all the alternatives, achieving OY could require constraining fishing opportunity through the implementation of management measures.

## CHAPTER 5    **CONSISTENCY WITH THE MSA NATIONAL STANDARDS**

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An FMP or plan amendment and any pursuant regulations must be consistent with 10 national standards contained in the MSA (§301). These are:

NS1 states that conservation and management measures shall prevent overfishing while achieving, on a continuing basis, the OY from each fishery for the United States fishing industry.

*The proposed action directly addresses National Standard 1 through the revised Guidelines at 50 CFR 600.310. Proposed amendments to the HMS FMP will make the FMP consistent with these guidelines.*

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

*The preferred alternative allows for more explicit and consistent consideration of the best scientific information available by allowing the Council to periodically evaluate numerical estimates of MSY, OY, and SDC based on the most recent stock assessments or other available information. A secondary level of review and oversight is provided by the NMFS review and approval process, adding to the overall assurance that the best available science is being adhered to.*

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

*The proposed action does not affect stock management, except that two HMS FMP MUS, pelagic and bigeye thresher sharks, would be designated EC species and not “in the fishery.” The evaluation in this EA shows that these two species are landed in modest amount in west coast fisheries and monitoring of these small amounts of catch is sufficient to ensure their conservation at this time. Should catch trends change substantially the Council may consider whether to actively management them through a subsequent FMP amendment.*

National Standard 4 states that conservation and management measures shall not discriminate between residents of different states. If it becomes necessary to allocate or assign fishing privileges among

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various United States fishers, such allocation shall be (A) fair and equitable to all such fishers; (B) reasonably calculated to promote conservation; and (C) carried out in such manner that no particular individual, corporation, or other entity acquires an excessive share of such privileges. The proposed measures will not discriminate between residents of different states.

*The proposed action does not include proposal to allocate or assign fishing privileges.*

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

*The proposed action does not directly affect utilization nor does it allocate fishing opportunity.*

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

*The proposed action does not directly implement management measures, which are established and adjusted through the existing biennial process described in the HMS FMP. Nothing in the proposed action would modify this process in a way that would limit the Council's ability to consider differences among fisheries and fishery resources when considering management measures.*

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

*The proposed action is necessary to ensure the HMS FMP is consistent with revised National Standard 1 Guidelines and does not duplicate other measures implemented under the HMS FMP or the Council's other FMPs.*

National Standard 8 states that conservation and management measures shall, consistent with the conservation requirements of this Act (including the prevention of overfishing and rebuilding of overfished stocks), take into account the importance of fishery resources to fishing communities in order to (A) provide for the sustained participation of such communities, and (B) to the extent practicable, minimize adverse economic impacts on such communities.

*This EA evaluates the socioeconomic effects of the proposed action and found that the effects under the preferred alternative do not differ from No Action.*

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

*The proposed action implements the EC species designation described in revised National Standard 1 Guidelines. As described in this EA, the EC species designation is intended to facilitate monitoring of bycatch and bycatch mortality.*

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

*The proposed action does not include any measures affecting the safety of human life at sea.*

## CHAPTER 6 OTHER APPLICABLE LAW

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### 6.1 Other Federal Laws

#### 6.1.1 *Coastal Zone Management Act*

Section 307(c)(1) of the Federal Coastal Zone Management Act (CZMA) of 1972 requires all Federal activities that directly affect the coastal zone be consistent with approved state coastal zone management programs to the maximum extent practicable. The Council's preliminary preferred alternative would be implemented in a manner that is consistent to the maximum extent practicable with the enforceable policies of the approved coastal zone management programs of Washington, Oregon, and California. This determination will be submitted to the responsible state agencies for review under Section 307(c)(1) of the CZMA. The HMS FMP has been found to be consistent with the Washington, Oregon, and California coastal zone management programs (PFMC 2003see Section 10.7). The recommended action is consistent and within the scope of the actions contemplated under the framework FMP.

#### 6.1.2 *Endangered Species Act*

NMFS issued a biological opinion under the ESA for the HMS FMP on February 4, 2004. Nothing in the proposed action would prompt re-initiation of consultations under Section 7 of the Act.

#### 6.1.3 *Marine Mammal Protection Act*

The MMPA of 1972 is the principle Federal legislation that guides marine mammal species protection and conservation policy in the United States. Under the MMPA, NMFS is responsible for the management and conservation of 153 stocks of whales, dolphins, porpoise, as well as seals, sea lions, and fur seals; while the U.S. Fish and Wildlife Service is responsible for walrus, sea otters, and the West Indian manatee.

The analysis in this EA finds that marine mammals are not likely to be affected by the proposed action.

#### **6.1.4 Migratory Bird Treaty Act**

The MBTA of 1918 was designed to end the commercial trade of migratory birds and their feathers that, by the early years of the 20th century, had diminished the populations of many native bird species. The MBTA states that it is unlawful to take, kill, or possess migratory birds and their parts (including eggs, nests, and feathers) and is a shared agreement between the United States, Canada, Japan, Mexico, and Russia to protect a common migratory bird resource. The MBTA prohibits the take of seabirds with permitting provisions that have not been used in the context of marine fisheries.

#### **6.1.5 Paperwork Reduction Act**

The purposes of the Paperwork Reduction Act (PRA) are to minimize the burden of information collection by the Federal Government on the public; maximize the utility of any information thus collected; improve the quality of information used in Federal decision-making, minimize the cost of collection, use, and dissemination of such information; and improve accountability. The PRA requires Federal agencies to obtain clearance from the Office of Management and Budget before collecting information. This clearance requirement is triggered if certain conditions are met. "Collection of information" is defined broadly. In summary it means obtaining information from third parties or the public by or for an agency through a standardized method imposed on 10 or more persons. Collection of information need not be mandatory to meet the trigger definition. Even information collected by a third party, if at the behest of a Federal agency, may trigger the clearance requirement. Within NMFS the Office of the Chief Information Officer is responsible for PRA compliance. Obtaining clearance can take up to 9 months and is one aspect of NMFS's review and approval of Council decisions.

The proposed action does not require collection-of-information subject to the PRA.

#### **6.1.6 Regulatory Flexibility Act**

The purpose of the RFA is to relieve small businesses, small organizations, and small governmental entities of burdensome regulations and record-keeping requirements. Major goals of the RFA are: (1) to increase agency awareness and understanding of the impact of their regulations on small business, (2) to require agencies to communicate and explain their findings to the public, and (3) to encourage agencies to use flexibility and to provide regulatory relief to small entities. The RFA emphasizes predicting impacts on small entities as a group distinct from other entities and the consideration of alternatives that may minimize the impacts while still achieving the stated objective of the action. An initial RFA (IRFA) is conducted unless it is determined that an action will not have a "significant economic impact on a substantial number of small entities." The RFA requires that an IRFA include elements that are similar to those required by EO 12866 and NEPA. Therefore, the IRFA has been combined with the RIR and both are substantially based on the analyses contained in this EIS document.

A combined IRFA/RIR has been prepared for the regulations developed to implement the FMP amendment. It is available on the NMFS Southwest Region website (<http://swr.ucsd.edu/>).

### **6.2 Executive Orders**

#### **6.2.1 EO 12866 (Regulatory Impact Review)**

Executive Order 12866, Regulatory Planning and Review, was signed on September 30, 1993, and established guidelines for promulgating new regulations and reviewing existing regulations. The EO covers a variety of regulatory policy considerations and establishes procedural requirements for analysis

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of the benefits and costs of regulatory actions. Section 1 of the EO deals with the regulatory philosophy and principles that are to guide agency development of regulations. It stresses that in deciding whether and how to regulate, agencies should assess all of the costs and benefits across all regulatory alternatives. Based on this analysis, NMFS should choose those approaches that maximize net benefits to society, unless a statute requires another regulatory approach.

A combined IRFA/RIR has been prepared for the regulations developed to implement the FMP amendment. It is available on the NMFS Southwest Region website (<http://swr.ucsd.edu/>).

### **6.2.2 EO 12898 (Environmental Justice)**

EO 12898 obligates Federal agencies to identify and address “disproportionately high adverse human health or environmental effects of their programs, policies, and activities on minority and low-income populations in the United States” as part of any overall environmental impact analysis associated with an action. NOAA guidance, NAO 216-6, at Section 7.02, states that “consideration of EO 12898 should be specifically included in the NEPA documentation for decision-making purposes.” Agencies should also encourage public participation, especially by affected communities, during scoping, as part of a broader strategy to address environmental justice issues.

The environmental justice analysis must first identify minority and low-income groups that live in the project area and may be affected by the action. Typically, census data are used to document the occurrence and distribution of these groups. Agencies should be cognizant of distinct cultural, social, economic, or occupational factors that could amplify the adverse effects of the proposed action. (For example, if a particular kind of fish is an important dietary component, fishery management actions affecting the availability, or price of that fish, could have a disproportionate effect.) In the case of Indian tribes, pertinent treaty or other special rights should be considered. Once communities have been identified and characterized, and potential adverse impacts of the alternatives are identified, the analysis must determine whether these impacts are disproportionate. Because of the context in which environmental justice is developed, health effects are usually considered, and three factors may be used in an evaluation: whether the effects are deemed significant, as the term is employed by NEPA; whether the rate or risk of exposure to the effect appreciably exceeds the rate for the general population or some other comparison group; and whether the group in question may be affected by cumulative or multiple sources of exposure. If disproportionately high adverse effects are identified, mitigation measures should be proposed. Community input into appropriate mitigation is encouraged.

In support of environmental analyses supporting Council groundfish actions, 2000 census data have been analyzed to identify coastal communities that may be considered low income and/or having a large minority population (PFMC 2004, Appendix A, Section 8.5) and “communities of concern” because their populations have a lower income or a higher proportion of minorities than comparable communities in their region. As discussed in that analysis (PFMC 2004, page 299) the demographic characteristics of ports in urbanized areas may not accurately reflect what groups will be affected by fishery actions. Fishery participants make up a small proportion of the total population in these communities, and their demographic characteristics may be different from the community as a whole. However, information specific to fishery participants is not available. Furthermore, different segments of the fishery-involved population may differ demographically. For example, workers in fish processing plants may be more often from a minority population while deckhands may be more frequently low income in comparison to vessel owners. Because of the limited scope of the proposed action, it is unlikely to disproportionately affect low income or minority populations.

### **6.2.3 EO 13132 (Federalism)**

EO 13132, which revoked EO 12612, an earlier federalism EO, enumerates eight fundamental federalism principles. The first of these principles states Federalism is rooted in the belief that issues that are not national in scope or significance are most appropriately addressed by the level of government closest to the people. In this spirit, the EO directs agencies to consider the implications of policies that may limit the scope of or preempt states' legal authority. Preemptive action having such federalism implications is subject to a consultation process with the states; such actions should not create unfunded mandates for the states; and any final rule published must be accompanied by a federalism summary impact statement.

The Council process offers many opportunities for states (through their agencies, Council appointees, consultations, and meetings) to participate in the formulation of management measures. This process encourages states to institute complementary measures to manage fisheries under their jurisdiction that may affect federally-managed stocks.

### **6.2.4 EO 13175 (Consultation and Coordination with Indian Tribal Government)**

EO 13175 is intended to ensure regular and meaningful consultation and collaboration with tribal officials in the development of Federal policies that have tribal implications, to strengthen the United States government-to-government relationships with Indian tribes, and to reduce the imposition of unfunded mandates upon Indian tribes.

The Secretary recognizes the sovereign status and co-manager role of Indian tribes over shared Federal and tribal fishery resources. At Section 302(b)(5), the MSA reserves a seat on the Council for a representative of an Indian tribe with federally-recognized fishing rights from California, Oregon, Washington, or Idaho.

The proposed action does not affect fish stocks or fisheries in which tribes have a treaty right or substantial participation.

### **6.2.5 EO 13186 (Responsibilities of Federal Agencies to Protect Migratory Birds)**

EO 13186 supplements the MBTA (above) by requiring Federal agencies to work with the USFWS to develop memoranda of agreement to conserve migratory birds. NMFS is in the process of implementing a memorandum of understanding. The protocols developed by this consultation will guide agency regulatory actions and policy decisions in order to address this conservation goal. The EO also directs agencies to evaluate the effects of their actions on migratory birds in environmental documents prepared pursuant to the NEPA. This EA evaluates the impacts of the proposed action on seabirds.

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# **APPENDIX A: Proposed Changes to the FMP Text IN AMENDMENT 2**

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## INTRODUCTION

In order to comply with revised NSI Guidelines revisions to Chapters 2-5 of the HMS FMP are proposed as outlined below.

- Insertions marked by underline
- Deletions marked by ~~striketrough~~
- Moves (original location) marked by ~~double striketrough~~
- Moves (new location) marked by double underline

In addition to the revisions shown herein the following changes to the FMP will be made to ensure consistency with the purposes of this amendment:

- The lists of definitions and acronyms at the front of the FMP will be revised to reflect proposed changes
- The first paragraph in Section 1.1, describing amendments to the FMP will be updated to reflect this second amendment

## 2.0 MANAGEMENT PHILOSOPHY

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### 2.3 Unilateral Management, Harvest Guidelines and Quotas, and Overfishing

#### 2.3.1 Unilateral Management

For most MUS in this FMP, U.S. harvest by West Coast-based vessels represents only a small fraction of total fishing mortality out of the overall range of the species, and any unilateral action, such as a reduction in the U.S. West Coast harvest or effort, would not likely have a significant biological effect on the stock. However, as discussed in the section on overfishing (see “overfishing” below), ~~U.S. law~~ the MSA requires unilateral action when ~~the Secretary of Commerce (Secretary) a stock is determined to be a stock is subject to overfishing or overfished, and the Secretary has not determined that these conditions are due to excessive international fishing pressure.~~ Furthermore, unilateral management of U.S. vessels may also be appropriate under some circumstances apart from overfishing. This is particularly true for vulnerable stocks, defined, in part, as stocks that will require more than ten years to recover from depletion (see Section 4.1). Circumstances where unilateral management may be appropriate, not necessarily because a stock is overfished, include, but are not limited to, the following situations:

1. Where a stock is regionally distributed, and a significant portion of the regional distribution is subject to harvest by U.S. West Coast fisheries;
2. Where the ESA, the MMPA, or the MBTA mandate that a species be protected in both United States’ and international waters; or
3. Where unilateral action is needed to address domestic issues such as local depletion, protection for essential fish habitat in United States’ waters, bycatch reduction, catch allocations, or conflicts among user groups.

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#### 2.2.3 Overfishing

~~Sections 304(e) and 304(i) of the Magnuson-Stevens Act, 16 U.S.C. §1854(e) and (i), governs the response to overfishing and rebuilding of overfished stocks. At any time, if the Secretary of Commerce (Secretary) determines that a fishery is overfished or approaching a condition of being overfished, the Secretary must immediately notify the Council and request that actions be taken to end overfishing and rebuild the affected stock(s). For those fisheries managed under an FMP or an international agreement, the status is determined using the criteria for overfishing specified in the FMP or the agreement. If the Secretary determines that overfishing is due to excessive international fishing pressure the requirements of MSA Section 304(i) apply; otherwise, the requirements of Section 304(e) apply. Once an HMS stock is determined to be overfished and subject to the requirements of Section 304(e), the Council must prepare, within one two years, an FMP amendment or proposed regulations to end overfishing and rebuild the affected stock (see Section 4.1.5). The Council’s rebuilding plan will reflect traditional participation in the fishery, relative to other nations, by fishers of the United States, consistent with Section 304(e)(4)(C) of the Magnuson-Stevens Act, 16 U.S.C. §1854(e)(4)(C).~~

Because of the widespread distribution of HMS stocks outside the U.S. EEZ, it is recognized that unilateral action by the U.S. will likely provide little or no biological benefit to most of the stock(s) managed under this FMP, and that concerted international efforts will be required in order to achieve rebuilding. Therefore, the Secretary may invoke the provisions of MSA Section 304(i) (also 50 CFR 600.310(k)) in cases where a fishery is overfished or approaching a condition of being overfished due to excessive international fishing pressure. ~~if NMFS notifies the Council that a stock managed under an~~

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~~international agreement is overfished or is approaching a condition of being overfished, Under Section 304(i) within one year after the Secretary's determination, the Council shall develop recommendations for domestic regulations to address the relative impact of U.S. fishing vessels may, in connection with preparing a rebuilding plan pursuant to the Magnuson-Stevens Act at 16 U.S.C. 1854(e) and 50 C.F.R. 600.310(e), and provide analysis and documentation to NMFS Congress and the Department Secretary of State recommendations for international actions that will end overfishing and rebuild affected stocks supporting its recommendation for action under the international agreement to end or prevent overfishing. It is expected that the Department of State and U.S. delegation, in coordination with NMFS, will consider the Council's recommendation in developing U.S. positions for presentation to the international body, and will keep the Council informed of actions by the international body to end or prevent overfishing. These actions will may be taken into account by the Council in completing its rebuilding plan, and in when developing its recommendation to NMFS as to what for any additional U.S. regulations, if any, may be necessary to end or prevent overfishing address the relative impact of U.S. fishing vessels on HMS stocks subject to the provisions of Section 304(i). The Council's rebuilding plan will reflect traditional participation in the fishery, relative to other nations, by fishers of the United States, consistent with Section 304(e)(4)(C) of the Magnuson-Stevens Act, 16 U.S.C. §1854(e)(4)(C).~~

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### 2.4 Fixed Elements of the Fishery Management Plan

Fixed elements are the long-standing elements of a fishery management program that direct how it is applied and for what purpose. FMP amendments are required when fixed elements of the FMP are changed, as well as for major or controversial actions outside the scope of the original FMP.

Examples of fixed element actions that would require an FMP amendment include:

- changes to management objectives;
- changes to the species in the management unit (actively managed species);
- changes to the methods for determining MSY, OY and SDC; <sup>14</sup>~~control rules (definition of overfishing);~~
- amendments to any procedures required by the FMP;
- implementation of limited entry programs. This FMP does not propose a federal limited entry program for any HMS fishery at this time. The Council adopted a control date of March 9, 2000 for commercial and party/charter fisheries for HMS, in anticipation that a limited access program may be needed in the near future. Meanwhile, existing state limited entry programs for HMS fisheries will remain in effect when the FMP is implemented; and
- allowing a longline fishery in the EEZ (other than through approved activities under an EFP).

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### 3.0 SPECIES IN THE MANAGEMENT UNIT

Numerous species are caught in HMS fisheries. Those to be actively managed are the Management Unit Species (MUS) listed in Section 3.1. Other species, caught incidentally to targeted species, ~~will~~

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<sup>14</sup> Numerical estimates of these reference points may be periodically revised, based on the best scientific information, without requiring an FMP amendment. Any such revised determinations, after approval by NMFS, will be published in the annual SAFE report (see Section 4.3).

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be were originally classified in the FMP as monitored; under revised National Standard 1 Guidelines, some of those species have been reclassified as ecosystem component (EC) species.

HMS fishing gears catch an assortment of tunas, billfish, sharks and other fishes, and some protected species as well. Important species, which meet certain criteria described below, are designated as management unit species, that is, they are subject to active management by the FMP. The management unit species are addressed in Section 3.1.

In addition to management unit species, ~~over the incidental catch of at least fifty other fish species are caught~~has been recorded. It is recommended that data be collected for these and any others caught by HMS gears to assess the amount and type of bycatch as required by the Magnuson-Stevens Act.

~~EC Species included for monitoring purposes~~ are discussed in Section 3.23. ~~One or more~~Any of these species could be added to the management unit through a plan amendment, if warranted by changes in west coast HMS fisheries~~by action of the Council. This requires a plan amendment.~~

~~A few s~~Species are designated by this FMP as prohibited because of their ~~special status~~are addressed in Section 3.4. These species, if intercepted, must be released immediately, unless there are other provisions for their disposition, or unless permits are held for their capture. ~~Prohibited species are addressed in Section 3.3.~~

Protected species caught incidentally to HMS fisheries include various species of seabirds, sea turtles and marine mammals. Protected species are addressed in Appendix D by HMS fishery type, and in Section 6.1.5.

## 3.1 Management Unit Species (Actively Managed)

The Plan Development Team and the Council examined a number of different criteria and alternatives for species to be included in the management unit. Public testimony covered a wide range of alternatives, from a relatively short list of target species in West Coast HMS fisheries, to a long list of species harvested by HMS fisheries. The Council assumed that species placed in the management unit would be candidates for active management, i.e., the fisheries for these species may need to be managed through the Council process resulting in Federal regulations to implement adopted management measures~~regulated by the federal government.~~ The Council also understood that maximum sustainable or optimum yield (bio-analytically-based or proxy) is the basis of management and would have to be specified for each species in the management unit, and that a definition of overfishing is required. The Council considered various combinations of the following criteria for including species in the management unit, with the stipulation that any species that met the first three criteria would be strongly considered for inclusion:

1. the species occurs in the Pacific Council management area
2. the species occurs in west coast HMS fisheries
3. the species is defined as highly migratory in the Magnuson-Stevens Act or the Law of the Sea Convention
4. the species is important (moderate to high value) in the landings or to the fishery
5. the species is managed by the Western Pacific ~~Region~~ Fishery Management Council
6. sufficient data exists to calculate a bio-analytically based MSY, including a reasonable MSY proxy that is based, e.g., on catches and yields that are stable over time
7. the species occurs in fisheries which the Pacific Council wants to actively manage
8. the species possesses special biological characteristics (e.g., low productivity)

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The Magnuson-Stevens Act defines highly migratory species as tuna species, marlin (*Tetrapturus* spp. and *Makaira* spp.), oceanic sharks, sailfishes (*Istiophorus* spp.) and swordfish (*Xiphias gladius*). The term “tuna species” includes albacore tuna (*Thunnus alalunga*), bigeye tuna (*T. obesus*), bluefin tuna (*T. thynnus* and *T. orientalis*), skipjack tuna (*Katsuwonus pelamis*), and yellowfin tuna (*T. albacares*). The inclusion of these definitions establishes the authority of the Secretary of Commerce to manage directly the above species in the Atlantic Ocean and Gulf of Mexico, without the need for a regional fishery management council FMP.

The United Nations Convention on the Law of the Sea, Annex I, defines “highly migratory species” to include: albacore tuna, bluefin tuna, bigeye tuna, skipjack tuna, yellowfin tuna, blackfin tuna (*Thunnus atlanticus*), little tuna (*Euthynnus alletteratus*; *E. affinis*), southern bluefin tuna (*T. maccoyii*), frigate mackerel (*Auxis thazard*; *A. rochei*), pomfrets (family Bramidae), marlins (*Tetrapturus angustirostris*; *T. belone*; *T. pfluegeri*; *T. albidus*; *T. audax*; *T. georgei*; *Makaira mazara*; *M. indica*; *M. nigricans*), sailfishes (*Istiophorus platypterus*; *I. albicans*), swordfish, sauries (*Scomberesox saurus*; *S. saurus scombroides*; *Cololabis saira*; *C. adocetus*), dorado (*Coryphaena hippurus*; *C. equiselis*), oceanic sharks (*Hexanchus griseus*; *Cetorhinus maximus*; *Rhincodon typus*; family Alopiidae; family Carcharhinidae; family Sphyrnidae; family Lamnidae), cetaceans (family Physteridae; family Balaenopteridae; family Balaenidae; family Eschrichtiidae; family Monodontidae; family Ziphiidae; family Delphinidae).

Species in the management unit of the Pelagic Fisheries FMP adopted by the Western Pacific Region Fishery Management Council are listed in Section 1.7.6.

The management unit includes:

### Tunas:

- North Pacific albacore (*Thunnus alalunga*)
- yellowfin tuna (*Thunnus albacares*)
- bigeye tuna (*Thunnus obesus*)
- skipjack tuna (*Katsuwonus pelamis*)
- northern bluefin tuna (*Thunnus orientalis*)

### Sharks:

- common thresher shark (*Alopias vulpinus*)
- ~~pelagic thresher shark (*Alopias pelagicus*)~~
- ~~bigeye thresher shark (*Alopias superciliosus*)~~
- shortfin mako or bonito shark (*Isurus oxyrinchus*)
- blue shark (*Prionace glauca*)

### Billfish/Swordfish:

- striped marlin (*Tetrapturus audax*)
- swordfish (*Xiphias gladius*)

### Other:

- dorado or dolphinfish (*Coryphaena hippurus*)

The management unit includes all five species of tuna which are important to commercial and recreational fisheries in the north Pacific (albacore, bluefin) and eastern tropical Pacific (yellowfin, bigeye, skipjack). Striped marlin is included because of its importance to the recreational fishery in California. Swordfish is a major target in commercial drift gillnet, harpoon and longline fisheries, and is pursued by anglers. Blue shark is an abundant bycatch species in drift gillnet and longline fisheries. It has been the target of some directed shark fisheries in the past, and currently is caught by anglers.

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Common thresher shark and shortfin mako shark are important species in the drift gillnet fishery and also are targeted by recreational fishers. ~~Bigeye and pelagic thresher sharks are landed by the drift gillnet fishery but in small amounts compared to common thresher and mako sharks. They are included in the management unit largely because of concern that they have poor resilience to fishing.~~ Dorado is an important component of the suite of species targeted by recreational fishers, especially in southern California.

The species are to be managed aiming for consistency in both regional and international management. Since the MUS tunas and billfishes are fished ocean-wide and are already assessed or reviewed regularly at international forums, the Council's main task would be to ensure that their local management is neither inconsistent with, nor is abrogated by, international management. The more regionally distributed sharks not currently under international management require more direct, regional or local assessments of stock status and possibly regional management (common thresher and shortfin mako sharks). Where production potentials cannot be estimated accurately (e.g., because only small fractions of the stocks are taken), the species, as MUS, will still be regularly reviewed under Council guidance (e.g., pelagic and bigeye thresher sharks; dorado).

### 3.2 Determining the Primary FMP for Managed Stocks

National Standard 1 Guidelines state if a stock is identified in more than one fishery, Councils should choose which FMP will be the primary FMP in which management objectives and reference points (see Chapter 4) will be established. Conservation measures in the FMP that is not the primary FMP should be consistent, to the extent practicable, with those established in the primary FMP. Since, as discussed above, a criterion for choosing the managed species in this FMP is their management by the WPFMC, the PFMC and WPFMC will coordinate to identify the primary FMP for Pacific stocks of the managed species. Generally, the WPFMC's FMPs will be primary for stocks occurring in the Western and Central Pacific Ocean and this FMP will be the primary FMP for stocks occurring in the Eastern Pacific Ocean (with the jurisdictional boundaries of the WCPFC and IATTC serving to define these regions). Another important criterion in considering the primary FMP is the relative importance of the stock to fisheries managed under the respective FMPs. This consideration is especially important for stocks where stock structure is poorly understood or the stock is considered a single stock across the North Pacific. Identification of the primary FMP does not preclude either Council from developing recommendations and participating in international forums related to the management in the Pacific Ocean of the species herein.

### 3.23 Species Included in the FMP for Monitoring Purposes Ecosystem Component Species

According to revised National Standard 1 Guidelines (600.310(d)(1)) all stocks in an FMP are considered to be "in the fishery" by default unless they are identified as ecosystem component (EC) species. There are several criteria that should be met for a species to be included in the EC category (§660.310(d)(5)). These are:

- Be a non-target stock/species;
- Not be subject to overfishing, approaching overfished, or overfished and not likely to become subject to overfishing or overfished in the absence of conservation and management measures; and
- Not generally retained for sale or personal use, although "occasional" retention is not by itself a reason for excluding a species from the EC category.

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One of the reasons given for including EC species in an FMP is for data collection purposes. EC species are not considered “in the fishery” but Councils should consider measures to mitigate and minimize bycatch of these species, to the extent practicable, consistent with National Standard 9. MSY, OY and other reference points (see Chapter 4) do not need to be specified for EC species. Identification of EC species will help the Council to track these species over time, periodically evaluate their status, and assess whether any management is needed under the FMP, in which case an EC species could be reclassified as a managed species. Identification of EC species also allows the Council to consider measures to minimize bycatch and bycatch mortality of EC species and to protect their associated role in the ecosystem.

The criteria for species included in the FMP for monitoring purposes are:

- species having a record of being caught in an HMS fishery
- not covered by another FMP or state management regime, or
- of special concern (e.g., elasmobranchs, which have relatively low productivity).

~~These species, which often comprise a fishery’s bycatch, should be monitored on a consistent and routine basis to the extent practicable. Sampling periodicity and coverage fraction will depend upon the take rates of the species that are of most concern. This monitoring is needed to evaluate the impact of HMS fisheries on incidental and bycatch species (as well as MUS), and to track the effectiveness of bycatch reduction methods (see Section 6.1.3). Monitored species~~EC species other than the MUS and prohibited species (see below and Section 6.1.6) are:<sup>15</sup>

### **Billfishes and Swordfish**

~~Black marlin, *Makaira indica*~~

~~Blue marlin, *Makaira nigricans*~~

~~Pacific sailfish, *Istiphorus platypterus*~~

~~Shortbill spearfish, *T. angustirostris*~~

### **Sharks and Rays**

~~Bat ray, *Myliobatis californica*~~

~~Blacktip shark, *C. limbatus*~~

~~Dusky shark, *C. obscurus*~~

~~Hammerhead sharks, Sphyrnidae~~

~~Leopard shark, *Triakis semifasciata*~~

~~Manta/Mobula rays, Mobulidae~~

~~Oceanic whitetip shark, *C. longimanus*~~

~~Pelagic sting ray, *Dasyatis violacea*~~

~~Prickly shark, *Echinorhinus cookei*~~

~~Salmon shark, *Lamna ditropis*~~

~~Silky shark, *Carcharhinus falciformis*~~

~~Six gill shark, *Hexanchus risus*~~

~~Southern shark, *Galeorhinus galeus*~~

~~Spiny dogfish, *Squalus acanthias*~~

~~Whale shark, *Rincodon typus*~~

bigeye thresher shark (*Alopias superciliosus*)

pelagic thresher shark (*Alopias pelagicus*)

<sup>15</sup> ~~Note: This list of monitored species was incorrect in the FMP as originally published in revised form pursuant to Amendment 1. The FMP with the corrected list was produced in August 2009.~~

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## **Tunas and Mackerels**

Black skipjack, *Euthynnus lineatus*  
Bullet mackerel (tuna), *Auxis rochei*  
Pacific bonito, *Sarda chiliensis*  
Wahoo, *Acanthocybium solandri*

## **Jacks and Pomfrets**

Pacific moonfish, *Selene peruviana*  
Pacific pomfret, *Brama japonica*  
Rainbow runner, *Elagatis bipinnulata*

## **Other Fishes**

Common mola, *Mola mola*  
Escolar, *Lepidocybium flavobrunneum*  
Lancetfishes, Alepisauridae  
Louvar, *Luvarus imperialis*  
Oarfish, *Regalecus glesne*  
Oilfish, *Ruvettus pretiosus*  
Opah, *Lampris guttatus*  
Pacific saury, *Cololabis saira*

Bigeye and pelagic thresher sharks are landed by the drift gillnet fishery but in small amounts compared to common thresher and mako sharks. They Originally included in the FMP as managed species are included in the management unit largely because of concern that they have poor resilience to fishing, they were re-designated EC species under FMP Amendment 2, because of the low number caught in west coast commercial and recreational fisheries.

As outlined in Section 4.3 of this FMP, each year the HMS Management Team will deliver one combined SAFE report for all species in this FMP to the Council. The SAFE report will follow the guidelines specified in National Standard 2 ~~(of 10)~~ and will be used by the Council and NMFS to develop and evaluate regulatory adjustments, if necessary, under the framework procedure or the FMP amendment process. ~~It~~ The SAFE will document track and report on significant trends or changes in monitored EC species over time, and assess the relative success of existing state and federal fishery management programs. The SAFE report will also make recommendations to the Council concerning conservation and management of bycatch and incidental catch.

### **3.34 Prohibited Species**

A few species are considered for inclusion under the category Prohibited Species in this Plan. In general, prohibited species must be released immediately if caught, unless other provisions for their disposition are established, including for scientific study. Striped marlin, now allowed for sport-only and not commercial fishing by California, is prohibited by specific allocation and is discussed separately in Section 6.2.4. Pacific halibut and salmon are managed separately from this Plan, but are important in some HMS fisheries and so are provided for here with respect to how they can be caught. Prohibited species in HMS fisheries are:

Great white shark (*Carcharodon carcharias*)  
Basking shark (*Cetorhinus maximus*)  
Mega mouth shark (*Megachasma pelagio*)

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Pacific halibut (*Hippoglossus stenolepis*)  
Pink salmon (*Onchorhynchus gorbuscha*)  
Chinook salmon (*O. tshawytscha*)  
Chum salmon (*O. keta*)  
Sockeye salmon (*O. nerka*)  
Coho salmon (*O. kisutch*)

## 4.0 PREVENTING OVERFISHING AND ACHIEVING OPTIMUM YIELD

The concepts of control rules and status determination criteria for management and the default and alternative management control rules for this FMP, are discussed below. Control rules for managing MUS are required under the Magnuson-Stevens Act.

### 4.1 Control Rules and Preventing Overfishing Reference Points Including MSY, OY, and Status Determination Criteria

These criteria reference points are guideposts for managing exploited stocks and require being able to determine and monitor the effects of fishing. But such effects are not always clear, e.g., catch per unit of effort trends may not only reflect the abundance of HMS, but also how fishing success is affected by schooling or wide-ranging behaviors, fishing efficiency, and environmental effects on the availability of species. Estimated population status of management unit species is discussed in Section 4.8 and summarized in Tables 4-4 and 4-5. The SAFE Report (see Section 4.3), produced annually, provides periodic updates to the information found in this FMP.

Many of the more productive HMS species support large and widespread international fisheries that are best managed cooperatively with other nations. In particular, rebuilding programs, required unilaterally by the Magnuson-Stevens Act for overfished stocks, would be ineffective without international cooperation, especially if domestic catches are only small fractions of the stock-wide harvest (see Table 4-5 for West Coast catch fractions). For such species, regional remedial actions must be to the extent practicable, concurrent with recommendations/resolutions adopted at international forums for cooperative action (see Section 4.5 on stock rebuilding).

Still other HMS species possess life histories characterized by low productivity, thus supporting smaller fisheries that tend to be more regional than international. They have more localized distributions and life stage needs, often within the EEZ. Not only are they more easily overfished, but recovery takes longer, i.e., the species are less resilient to overfishing. Their management should be more conservative, and may require strong more proactive and targeted regional leadership.

Managing conservatively means being precautionary, especially when there are large uncertainties in how a stock is being affected by fishing. Besides lowering the threshold for taking remedial action, it could mean preventing rapid growth of fisheries to prevent overshooting of management goals, or taking steps to protect the reproductive potential of stocks.

The goal of the Magnuson-Stevens Act, as amended by the Sustainable Fisheries Act of 1996 and Magnuson-Stevens Reauthorization Act of 2006, is to ensure the long term sustainability of fisheries and fish stocks by halting or preventing overfishing and by rebuilding overfished stocks. The Act requires developing fishery management plans for exploited species of U.S. seas including shelf, anadromous, and highly migratory species whose ranges extend beyond the EEZ. By its National Standard 1, optimum yield is the ultimate goal for each fishery.

National Standard 1 Guidelines, as required by the Magnuson-Stevens Act and published in the ~~(Code of Federal Regulations, (50 CFR 600.305 et. seq.10)~~ were developed to assist in implementing the Act ~~and introduced the terms “Control Rule” and “Status Determination Criteria” (SDC) relative to the requirements of National Standard 1 (NS 1). The control rule specifies how a fishery is to be managed depending upon stock status relative to the SDCs, which are biological benchmarks or thresholds. There are two SDCs: the Maximum Fishing Mortality Threshold (MFMT) and the Minimum Stock Size Threshold (MSST). By control rule definition, overfishing occurs when fishing mortality F is greater~~

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~~than the MFMT mortality. Similarly, a stock is **overfished** when its size falls below the MSST stock biomass. The Magnuson-Stevens Act (1304,e) requires NMFS to notify Congress when the stock is approaching the overfished condition (i.e., if there is overfishing and the stock is expected to be overfished within two years) and when it is overfished. Fishery managers must then take appropriate remedial action: in the case of approach to being overfished, harvest rates must be reduced below MFMT; in the case of being overfished, a rebuilding plan must be prepared within one year to rebuild the stock. The rebuilding plan must bring the stock back to the level producing maximum (or optimal) sustainable yield within a specified time period. The Guidelines call for precautionary management, i.e., use of conservative control rules with remedial action to begin even if the overfishing/overfished status cannot be established with certainty. The Guidelines state that the following items should be included in the FMP:~~

Maximum sustainable yield (MSY): MSY is the largest long-term average catch or yield that can be taken from a stock or stock complex under prevailing ecological, environmental conditions and fishery technological characteristics (e.g., gear selectivity), and the distribution of catch among fleets.

MSY fishing mortality rate (Fmsy): The fishing mortality rate that, if applied over the long term, would result in MSY.

MSY stock size (Bmsy): The long-term average size of the stock or stock complex, measured in terms of spawning biomass or other appropriate measure of the stock's reproductive potential that would be achieved by fishing at Fmsy.

Status determination criteria (SDC): Quantifiable factors or their proxies, that are used to determine if overfishing has occurred, or if the stock or stock complex is overfished. "Overfished" relates to biomass of a stock or stock complex, and "overfishing" pertains to a rate or level of removal of fish from a stock or stock complex. SDC are:

Maximum fishing mortality threshold (MFMT): The level of fishing mortality (F), on an annual basis, above which overfishing is occurring. The MFMT or reasonable proxy may be expressed either as a single number (a fishing mortality rate or F value), or as a function of spawning biomass or other measure of reproductive potential.

Overfishing limit (OFL): The annual amount of catch that corresponds to the estimate of MFMT applied to a stock or stock complex's abundance and is expressed in terms of numbers or weight of fish. The OFL is an estimate of the catch level above which overfishing is occurring.

Minimum stock size threshold (MSST): The level of biomass below which the stock or stock complex is considered to be overfished.

Optimum yield (OY): The amount of fish that will provide the greatest overall benefit to the Nation, particularly with respect to food production and recreational opportunities and taking into account the protection of marine ecosystems.

Acceptable biological catch (ABC): A level of a stock or stock complex's annual catch that accounts for the scientific uncertainty in the estimate of OFL and any other scientific uncertainty, and should be specified based on the ABC control rule.

ABC control rule: A specified approach to setting the ABC for a stock or stock complex as a function of the scientific uncertainty in the estimate of OFL and any other scientific uncertainty (see paragraph (f)(4) of this section).

Annual catch limit (ACL): The level of annual catch of a stock or stock complex that serves as the basis for invoking AMs. ACL cannot exceed the ABC, but may be divided into sector-ACLs.

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Annual catch target (ACT): An amount of annual catch of a stock or stock complex that is the management target of the fishery, and accounts for management uncertainty in controlling the actual catch at or below the ACL. ACTs are recommended in the system of accountability measures so that ACL is not exceeded.

ACT control rule: A specified approach to setting the ACT for a stock or stock complex such that the risk of exceeding the ACL due to management uncertainty is at an acceptably low level.

### **4.1.3 Adopted Control Rules**

This FMP adopts the default MSY (or MSY proxy) and OY control rules (Sections ~~4.4.1~~ 4.1.1.4 and 4.1.2.1), but additionally uses an OY (instead of MSY) target for vulnerable species (Section ~~4.1.2~~ 4.1.2.2). The default MSY control rule was chosen because it is the standard recommended in technical guidance for implementing National Standard 1 of the Magnuson-Stevens Act, and it is consistent with the WPRFMC's rule for pelagic fisheries. The vulnerable species OY control rule is applied to sharks because of their low productivity, and to bluefin tuna and striped marlin because of uncertainties concerning total catches and stock structures.

To be precautionary, the OY for vulnerable species is set for now at 0.75MSY (from the relationship shown in Figure 4-1). Any harvest guideline for vulnerable species is set equal to that OY. The status of the MUS in this FMP is discussed in terms of this default control rule in ~~Section 3.3~~ the annual HMS SAFE document. [N.B. – ~~deleted Section 3.3 reference is to 2003 HMS FMP FEIS~~]

### **4.1.1 Default Control Rules ~~MSY, SDC, and Determining Overfishing and Overfished~~**

#### **4.1.1.1 MSY**

Because MSY is a long-term average, it need not be estimated annually, but it must be based on the best scientific information available, and should be re-estimated as required by changes in long-term environmental or ecological conditions, fishery technological characteristics, or new scientific information.

As part of the biennial process (see Chapter 5) the HMSMT will review recent stock assessments or other information as described below and submit a draft SAFE document for review at the June Council meeting containing MSY estimates, noting if they are a change from the current value. The SSC will review these estimates and make a recommendation to the Council on their suitability for management. Based on this advice the Council may recommend a revision to a current MSY estimate to NMFS.

MSY is estimated based on the amount of information available about the stock. The following categories show the relationship between available information and the estimation of MSY:

**Category 1, regularly assessed stocks: The SSC reviews these estimates:** An estimate of MSY (and other MSY-based reference points) may be determined from the assessment. In the event that the Council determines, based on advice from the SSC, that MSY estimates derived from an assessment are not suitable for management, the Council may recommend changes in the way that MSY is estimated in the assessment. Because HMS assessments are generally conducted by working groups outside of the Council process, such recommendations would be forwarded to the RFMO conducting or sponsoring the stock assessment through the U.S. delegation for consideration when conducting future assessments. In that event the Council could recommend to retain any current MSY estimate in the FMP or regulations, or propose an alternate estimate.

**Category 2, unassessed stocks with catch history and additional information on relative abundance or stock productivity:** The HMSMT compiles the best available stockwide catch data, or if not available, regional catch data and all additional information on a stock's productivity including relative abundance or catch/effort data if available. MSY or proxy estimates will be developed based on the catch time series and additional information. The relative impact of U.S. west coast fisheries may help to inform decisions on selecting appropriate reference points.

**Category 3, unassessed stocks with catch history but lacking further information on relative stock abundance or productivity:** The HMSMT compiles the best available stockwide catch data, or if not available, regional catch data. A catch-based method such as the Depletion Corrected Average Catch (DCAC), Depletion Based Stock Reduction Analysis (DB-SRA), or in the case of a relatively stable catch history without indications of stock depletion, an average of selected catch levels may be chosen to represent a proxy MSY.

#### 4.1.1.2 MFMT and OFL

The general model for a control rule is the default **Maximum Sustainable Yield Control Rule** suggested in the Technical Guidance by Restrepo et al. (1998), and it is the model for this FMP. This control rule is a procedure for maintaining MSY, and is like that being considered by the Western Pacific Region Fishery Management Council. ~~It is illustrated schematically in Figure 4-1, where the x and y axes are in relative measure, the biomass and fishing mortality ratios  $B/B_{MSY}$  and  $F/F_{MSY}$ , respectively.~~ Here, The **MFMT mortality threshold** is the ratio  $F_{MFMT}/F_{MSY} = 1.0$ ; it is the mortality threshold for all stock levels above the MSST threshold (described below). ~~It is illustrated schematically in Figure 4-1, where the x and y axes are in relative measure, the biomass and fishing mortality ratios  $B/B_{MSY}$  and  $F/F_{MSY}$ , respectively.~~ With this MFMT ceiling emplaced, a stock would not be reduced to levels any lower than  $B_{MSY}$  that produces MSY (on average). It is to be noted, however, that the Technical Guidance for precautionary compliance with NS 1 (Restrepo, et al. 1998) allows that MFMT can be occasionally and temporarily exceeded at some level of probability that depends upon the variability of fishing mortality. The **OFL** is the annual amount of catch that corresponds to the estimate of MFMT applied to a stock or stock complex's abundance and is expressed in terms of numbers or weight of fish. The OFL is an estimate of the catch level above which overfishing is occurring.

#### 4.1.1.3 MSST

The **MSST biomass threshold**, the minimum biomass at which recovery measures are to begin, is the ratio  $B_{MSST}/B_{MSY}$ . It specifies a lower biomass level that allows remedial action not to be triggered each time B drops below  $B_{MSY}$ , simply from natural variation. In terms of  $B_{MSY}$ , the recommended level of  $B_{MSST}$  is:

$$B_{MSST} = (1-M)B_{MSY} \quad \text{when } M \text{ (natural mortality)} \leq 0.5, \text{ and}$$

$$B_{MSST} = 0.5B_{MSY} \quad \text{when } M > 0.5$$

(i.e., whichever is greater).  $B_{MSST}$  must not be less than  $B_{MIN} = 0.5B_{MSY}$  and should allow recovery back to  $B_{MSY}$  within 10 years when F is reduced to zero (to the extent possible).

#### 4.1.1.4 MSY Control Rule

~~and introduced the terms “Control Rule” and “Status Determination Criteria” (SDC) relative to the requirements of National Standard 1 (NS 1). The MSY control rule specifies how a fishery is to be managed depending upon stock status relative to the SDCs, which are biological benchmarks or thresholds. There are two SDCs: the Maximum Fishing Mortality Threshold (MFMT) and the~~

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~~Minimum Stock Size Threshold (MSST).~~ By control rule definition, **overfishing** occurs when fishing mortality  $F$  is greater than the MFMT mortality. Similarly, a stock is **overfished** when its size falls below the MSST stock biomass. ~~The Magnuson-Stevens Act (MSA Section 304(e) and 304(i) describe required responses requires NMFS to notify Congress when the a stock is subject to overfishing, approaching the overfished condition (i.e., if there is overfishing and the stock is expected to be overfished within two years) and when it is overfished. Fishery managers must then take appropriate remedial action in relation to the applicability of Sections 304(e) and 304(i). If Section 304(e) applies, in the case of approach to being overfished, action must be taken to prevent overfishing; if overfishing is occurring, harvest rates must be reduced below MFMT; in the case of being overfished, a rebuilding plan must be prepared within one year to rebuild the stock. The rebuilding plan must bring the stock back to the level producing maximum (or optimal) sustainable yield within a specified time period. If the Secretary determines overfishing is due to excessive international fishing pressure pursuant to Section 304(i) a different response is called for. The Council then develops recommendations for domestic regulations to address the relative impact of U.S. vessels and recommendations for international actions to end overfishing and rebuild affected stocks. The Guidelines call for precautionary management, i.e., use of conservative control rules with remedial action to begin even if the overfishing/overfished status cannot be established with certainty.~~

### 4.1.1.4 Determining if Overfishing is Occurring or a Stock is Overfished

The Council will monitor each managed HMS stock and determine annually, if possible, if overfishing is occurring and whether the stock is overfished. Overfishing is occurring if the fishing mortality rate exceeds MFMT or catch exceeds the OFL for 1 year or more.

The MSST or a reasonable proxy must be expressed in terms of spawning biomass or other reproductive potential. Should the estimated size of an HMS stock in a given year fall below this threshold, the stock is considered overfished.

### 4.1.2 Optimum Yield

OY is defined as MSY reduced by relevant socioeconomic factors, ecological considerations, and fishery-biological constraints so as to provide the greatest long-term benefits to the Nation. Therefore, OY cannot be set greater than MSY, and must take into account the need to prevent overfishing and rebuild overfished HMS stocks. To the extent possible, the relevant social, economic, and ecological factors used to establish OY for an HMS stock or fishery should be quantified and reviewed in historical, short-term, and long-term contexts. National Standard 1 Guidelines includes examples of factors that may be considered when determining OY. Normally, OY should not be greater than the ABC or ACL, if identified (see below). However, since OY is a long-term average and ABCs and ACLs are set annually there may be instances where the ABC or ACL could exceed the OY on a short-term basis. The OY specifications in Table 4-3 shall remain in effect until changed by recommendation of the Council, after considering recommendations of the SSC, and approval by NMFS. The OY for any management unit species not listed in Table 4-3 shall be determined preferably concurrently with addition to the management unit, or as soon as possible thereafter by recommendation of the Council, after considering input by the SSC, and approval by NMFS.

#### 4.1.2.1 Default OY Control Rule for Species Not Considered Vulnerable

As a default control rule, OY(proxy) = equals MSY or MSY(proxy) for species not considered vulnerable.

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~~Alternatively, OY may be reduced from MSY based on the range of considerations described in National Standard 1 Guidelines and using various methods. An For example, of an **Optimum Yield (OY) Control Rule** is also shown in Figure 4-1, it being the Restrepo et al. (1998) recommended, a precautionary default value of OY may be defined in terms of fishing mortality as  $0.75MFMT$ , of the MSY control rule (the lower dashed horizontal and slope line). This rule is for maintaining OY, which is defined as MSY reduced by relevant socioeconomic factors, ecological considerations, and fishery-biological constraints so as to provide the greatest long term benefits to the Nation. Simulation studies have indicated that management according to the OY default rule value will often allow biomasses ( $B_{OY}$ ) to be maintained at about  $1.25B_{MSY}$  (as shown), with yields of about 95% of MSY. This alternative default calculation is shown in Figure 4-1 (based on Restrepo et al. 1998). A Like for MSST of the MSY Control Rule, there is a **Minimum Biomass Flag ( $B_{FLAG}$ )** may be identified for the OY Control Rule equal to  $(1-M)B_{OY}$  or  $0.5B_{OY}$  (whichever is greater) (Boggs et al. 2000).  $B_{FLAG}$ , which would then be equivalent to  $1.25(B_{MSST}/B_{MSY})$ , serves as a warning call to halt biomass reduction that would jeopardize obtaining OY on average.~~

~~The OY control rule has a more conservative range of restraints that may be appropriate for more vulnerable species. The more vulnerable a species is to being overfished, the more conservative should management be. And since the maximum value of OY is MSY, then the more should the catch ratio OY/MSY be reduced from unity (while  $B_{OY}/B_{MSY}$  is increased from unity).~~

These control rules involve the concept of target and limit reference points. It can be seen that  $B_{MSY}$  and  $B_{OY}$  are target reference points for the long term management goals of MSY or OY. But  $B_{MSST}$  and  $B_{FLAG}$  are limit thresholds for the respective control rules that should not be exceeded, or exceeded only at some level of probability. A stock that is reduced below those biomass limits would normally require remedial action, because the target goals would then be jeopardized. Similarly,  $F_{OY}$  is a target reference point. However,  $F_{MSY}$  could be a target reference point or a limit threshold; it could be the target point for the MSY control rule or it could be the limit threshold for the OY control rule. If  $B < B_{FLAG}$  is expected with the latter rule, remedial action may be recommended even though the stock could still be far above  $B_{MSST}$ .

### 4.1.2.2 Alternative OY Management-Control Rule for Vulnerable Species

A stock's vulnerability is a combination of its productivity, which depends upon its life history characteristics, and its susceptibility to the fishery. Productivity refers to the capacity of the stock to produce MSY and to recover if the population is depleted, and susceptibility is the potential for the stock to be impacted by the fishery, which includes direct captures, as well as indirect impacts to the fishery (e.g., loss of habitat quality). In consultation with the SSC, the HMSMT may analyze the vulnerability of HMS stocks from time to time.

Since the management unit species vary from vulnerable to very productive, an alternative OY specification may be considered for vulnerable species. the default MSY control rule applies to MUS, but additionally, an alternative OY target control rule is used for "vulnerable" species.

Vulnerability of species can stem from many reasons, and any species that has been depleted to 50% below  $B_{MSY}$  (for the logistic production model, to 25% of unfished level  $B_0$ ) that is incapable of recovering back to that  $B_{MSY}$  level within 10 years (with fishing removed) is to be considered vulnerable in this FMP. The productivities (potential per capita rates of population increase  $r$ ) of such species would have to be 5% or less per year, assuming recovery time is determined by a linear compensatory increase in  $r$  with population decline (logistic model). Only the sharks among the MUS, including common thresher, are likely to have such low rates and long recovery times (see Table 4-1), and they are therefore considered vulnerable by this criterion. Vulnerable OYs are also appropriate for other fish species for other reasons of stock health concern (see bluefin tuna, Section 4.8.1, and striped marlin, Section 4.8.3).

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In this FMP, where OY is not determined analytically, an OY or OY proxy ~~is~~ may be defined according to vulnerability, starting with consideration of a value of  $0.75*(MSY \text{ or } MSY(\text{proxy}))$  as follows:

~~OY(proxy) = MSY or MSY(proxy) for species not considered vulnerable  
OY(proxy) =  $0.75*(MSY \text{ or } MSY(\text{proxy}))$  for species considered vulnerable~~

~~The rationale for using this approach to set the OY for the vulnerable species—OY follows from the recommended  $F_{OY} = 0.75F_{MSY}$  (see Figure 4–1). Then since  $MSY = F_{MSY}B_{MSY}$ ,  $OY = 0.75F_{MSY}B_{MSY} = 0.75MSY$  when estimated from the same  $B_{MSY}$  biomass. Starting from this consideration of an alternative OY specification, the Council may take into account other factors relating to the stock’s vulnerability (biological productivity and susceptibility to fisheries) in determining an appropriate OY for the stock. Likewise, the OY control rule has a more conservative range of restraints that may be appropriate can be adjusted for more vulnerable species. The more vulnerable a species is to being overfished, the more conservative should management be. And since the maximum value of OY is MSY, then the more should the catch ratio  $OY/MSY$  be reduced from unity (while  $B_{OY}/B_{MSY}$  is increased from unity).~~

Since the default alternative rule is defined with MFMT and MSST as ratios relative to MSY (as in Figure 4–1), its resulting generality allows management according to specific criteria even without estimates of the absolute biomass or exploitation status of a stock. This allows all the MUS, diverse with respect to productivity, scientific understanding, and stock status, to be managed by the same rule and in accordance with the requirements of the Magnuson-Stevens Act. This control rule is the most straight-forward of the possible rules discussed by Restrepo et al. (1998) and is the one they recommend. The reduction in fishing mortality it calls for to rebuild depleted populations is intermediate with respect to the degree of depletion that can be remedied at acceptable rates of recovery. ~~It is the same rule being considered for the Western Pacific Region Fishery Management Council’s FMP for pelagic fisheries (but with the additional stipulation for vulnerable species).~~

### **~~4.1.3 Adopted Control Rules~~**

~~This FMP adopts the default MSY (or MSY proxy) control rule (Section 4.4.1), but additionally uses an OY (instead of MSY) target for vulnerable species (Section 4.1.2). The default MSY control rule was chosen because it is the standard recommended in technical guidance for implementing National Standard 1 of the Magnuson-Stevens Act, and it is consistent with the WPRFMC’s rule for pelagic fisheries. The vulnerable species OY control rule is applied to sharks because of their low productivity, and to bluefin tuna and striped marlin because of uncertainties concerning total catches and stock structures. To be precautionary, the OY for vulnerable species is set for now at  $0.75MSY$  (from the relationship shown in Figure 4–1). Any harvest guideline for vulnerable species is set equal to that OY. The status of the MUS in this FMP is discussed in terms of this default control rule in Section 3.3.~~

### **4.1.4 ABC, ACLs, ACTs, and Accountability Measures**

According to the National Standard 1 Guidelines an ABC and a related ACL must be set for stocks managed under an FMP. However, the Guidelines include an exception to this requirement for stocks subject to management under an international agreement, which is defined as “any bilateral or multilateral treaty, convention, or agreement which relates to fishing and to which the United States is a party” (50 CFR 600.310(h)(2)(ii)). The Council has determined that all the managed stocks in this FMP meet this criterion. Therefore, the Council will not normally set ABCs and ACLs for managed HMS stocks. However, application of this exception does not preclude the Council from setting an ACL (and identifying an associated ABC to facilitate setting the ACL) if circumstances warrant.

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The ABC is a level of a stock's annual catch that accounts for scientific uncertainty in the estimate of OFL and any other scientific uncertainty. The ABC may not exceed the OFL. The HMSMT will develop ABC control rules for those managed stocks for which they are required. The ABC control rule will be reviewed by the Council's SSC. Based on that review the Council will adopt the ABC control rule judged suitable by the SSC. Through this process the ABC control rule may be revised from time to time based on the best scientific information available. The ABC will be expressed in terms of catch, or landings if the ABC control rule incorporates an estimate of bycatch or other sources of fishing mortality.

The Council will establish ACLs for those managed stocks for which they are required. ACTs and ACT control rules may be established if they would help ensure the ACL is not exceeded. The ACL may not exceed the ABC. ACLs will be established for each year in the biennial management cycle (see Chapter 5). ACLs are established, reviewed, and may be adjusted as part of the periodic management cycle described in Section 5.2. No "sector ACLs" are identified (see 50 CFR 660.310(f)(5)(ii)) in this FMP, but may be established as part of the biennial management process.

The biennial management process will be used to implement accountability measures (AMs) should they be required. AMs are management controls to prevent ACLs from being exceeded and to correct or mitigate overages of the ACL if they occur.

Annually, the HMSMT will gather the requisite information needed to determine whether an ACL has been exceeded as soon as possible after the end of the fishing year (March 31). If catch exceeds the ACL more than once in the last four years, the system of ACLs and AMs will be reevaluated and modified if necessary. For the purposes of this evaluation a 3-year moving average or other multi-year approach may be used, if there are insufficient data to conduct the evaluation based on a single year's catch.

### **4.1.45 Stock Rebuilding Council Response to Overfishing**

If a stock is subject to overfishing, approaching being overfished, or overfished fishery managers must then take appropriate remedial action.

#### **4.1.5.1 International Overfishing**

If the Secretary determines that a stock is overfished or approaching the condition of being overfished due to excess international fishing pressure, and for which there are no measures (or no effective measures) to end overfishing under an international agreement to which the United States is a party, then the Council will respond according to the procedures described in Section 304(i) of the MSA (and 50 CFR 600.310(k)).

#### **4.1.5.2 Rebuilding Stocks when International Fishing Pressure is not the Cause**

When stock size  $B$  falls below its MSST level,  $F$  must be reduced below its fishing mortality threshold to allow stock rebuilding at least back to  $B_{MSY}$ . The amount of mortality reduction would depend upon the severity of stock depletion below MSST, the stock's capacity to rebound, and the desired recovery time of the stock. In rebuilding according to the default MSY control rule (Figure 4-1),  $F$  is reduced linearly by the amount that  $B$  is determined to be below MSST. After the stock has been rebuilt back to MSST, maintaining  $F$  at the MFMT level will allow the stock to continue its increase until at equilibrium at  $B_{MSY}$ . With the OY Control Rule, the decrease from  $F_{OY}$  is shown beginning at  $B_{MSY}$ , rather than at  $B_{FLAG}$ , to enable faster rebuilding back to  $B_{OY}$ .

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Under NMFS's National Standard Guidelines, a number of factors enter into the specification of the time period for rebuilding. The lower limit of the specified time period for rebuilding is determined by the status and biology of the stock or stock complex and its interactions with other components of the marine ecosystem, and is defined as the amount of time that would be required for rebuilding if fishing mortality were eliminated entirely. If the lower limit is less than 10 years, then the specified time period for rebuilding may be adjusted upward to the extent warranted by the needs of fishing communities and recommendations by international organizations in which the United States participates, except that no such upward adjustment can result in the specified time period exceeding 10 years, unless management measures under an international agreement in which the United States participates dictate otherwise. If the lower limit is 10 years or greater, then the specified time period for rebuilding may be adjusted upward to the extent warranted by the needs of fishing communities and recommendations by international organizations in which the United States participates, except that no such upward adjustment can exceed the rebuilding period calculated in the absence of fishing mortality plus one mean generation time or equivalent period based on the species' life-history characteristics. Overfishing restrictions and recovery benefits must also be fair and equitable among fishery sectors. Rebuilding of internationally managed fisheries must reflect traditional U.S. participation in those fisheries relative to that of other nations.

Fishery management councils actually have considerable latitude in how they rebuild depleted stocks. The rebuilding rules illustrated in Figure 4-1 ~~and also Figures 4-2 and 4-3 (the F ramps) are~~ one examples of ~~just some of the~~ possible approaches to F-reduction. Actual rebuilding could proceed through a combination of ways, e.g. a series of stepped increases in F or series of increasing catch quotas as the biomass rebuilds back toward  $B_{MSY}$  (such quotas can be shown only indirectly in terms of the F and B dimensions of Figure 4-1).

Rebuilding of overfished stocks is a unilateral requirement by the Magnuson-Stevens Act, but, as already noted, internationally fished stocks require cooperative catch reductions among the fishing nations for this rebuilding to be effective. U.S. responsibility in the rebuilding, however, will be greater the more localized the stock and the greater the domestic take of the stock's production (see unilateral/international management, Section 2.2).

In general, rebuilding is to remedy stock depletion, but there can also be rebuilding to remedy **local depletion**. The latter rebuilding could be domestic and unilateral. Local depletion occurs when localized catches are in excess of replacement from local and external (via net immigration) sources of production. As such, it can occur independently of the status of the overall stock. The local depletion of abundance can be stronger than the concurrent stock-wide decrease (Squire and Au 1990). In all cases, the degree and extent of this depletion must be assessed relative to the health of the overall stock and the resiliency of the species.

### 4.2 Assessment of Stock Status

National Standard 2 requires using the best scientific information in managing management unit species. This requires periodic updating of stock status for comparing against their control rules. Status updating will be through Stock Assessment and Fishery Evaluation (SAFE) reports (Section 4.3). In the case of species under international management, the control rule approach must be promoted so that status in terms of SDCs (e.g.,  $F/F_{MSY}$ ,  $B/B_{MSY}$ ) can be described (see also Section 2.1).

The control rule approach implies an ability to determine the level of biomass B relative to its initial level  $B_0$  and (at least conceptually) relative to  $B_{MSY}$ , and to determine the level of mortality F relative to some target level like  $F_{MSY}$ . Relative biomass level could be estimated by the decline in catch rate (CPUE) or, with sufficient information on stock and recruitment, by percent spawning potential ratio (SPR), or

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proxies based on SPR, e.g.,  $B_{50\%}$  or  $F_{50\%}$ . Non-empirical MSY levels of B or F can be estimated as fractions of  $B_0$  or multiples of M, respectively, e.g.,  $B_{MSY}=0.5B_0$  or  $F_{MSY}=1.0M$ .

In many cases estimates of MSY or OY themselves are the only information available for management, and the  $F/F_{MSY}$  and  $B/B_{MSY}$  ratios must be derived from those estimates. This does not abrogate the control rule, because MSY and OY *are* the management goals. Where MSYs have not been determined, average stock-wide catch levels over appropriate time periods can be proxies.

Both MSY and OY refer to a species' sustainable catch, stock-wide. For some species there is no stock-wide catch information, and some (e.g., ~~pelagic threshers shark~~, mako shark, dorado) occur within the management area as the edges of wider distributions, so even their maximum, regional catch levels are unlikely to reflect stock production. While MSYs remain unknown for those species, the local catches can be used to estimate a local or regional level of MSY.

### 4.3 Stock Assessment and Fishery Evaluation Report

National Standard 2 of the Magnuson-Stevens Act requires that the best scientific information available be used in developing FMPs and implementing regulations. For HMS, except dorado and sharks, NMFS and the Pacific Council rely on analyses and assessments adopted by various international bodies (of which U.S. is an active participant), such as the Inter-American Tropical Tuna Commission (IATTC), Interim Scientific Committee for Tuna and Tuna-like Species in the North Pacific (ISC), Standing Committee on Tuna and Billfish (SCTB) and others. For other species such as dorado and sharks, the HMS Management Team and NMFS develops stock and fishery assessments, provides peer reviews and presents the results to the Council. The guidelines for implementation of NS 2 require preparation of an annual Stock Assessment and Fishery Evaluation (SAFE) report. The SAFE report will largely rely on international body assessments, NMFS directed assessments, and any new fishery information. The NS 2 guidelines for a SAFE report, adapted for this FMP, are below.

The SAFE report is a document or set of documents that provides the Council with a summary of information concerning the most recent biological condition of stocks and the marine ecosystems in the management unit and the social and economic condition of the recreational and commercial fishing interests, fishing communities, and the fish processing industries. It summarizes, on a periodic basis, the best available scientific information concerning the past, present, and possible future condition of the stocks, marine ecosystems, and fisheries being managed under federal regulation.

The Secretary of Commerce has the responsibility to assure that a SAFE report or similar document is prepared, reviewed annually, and changed as necessary. The Secretary or Council may utilize any combination of talent from Council, state, Federal, university, or other sources to acquire and analyze data and produce the SAFE report.

The SAFE report provides information to the Council and Southwest Region of NMFS for determining annual harvest levels from each stock, documenting significant trends or changes in the resource, marine ecosystems, and fishery over time, and assessing the relative success of existing state and Federal fishery management programs. Information on bycatch and safety for each fishery should also be summarized. In addition, the SAFE report may be used to update or expand previous environmental and regulatory impact documents, and ecosystem and habitat descriptions.

Each SAFE report must be scientifically based, and cite data sources and interpretations.

Each SAFE report should contain information on which to base harvest specifications, including ABCs, ACLs, and ACTs, if appropriate.

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Each SAFE report should contain a ~~description of the maximum fishing mortality threshold and the minimum stock size threshold~~ estimate of the MFMT or OFL, and MSST for each stock or stock complex, along with information by which the Council may determine:

- Whether overfishing is occurring with respect to any stock or stock complex; if any stock or stock complex is overfished; if the rate or level of fishing mortality applied to any stock or stock complex is approaching the maximum fishing mortality threshold, and if the size of any stock or stock complex is approaching the minimum stock size threshold.
- Any management measures necessary to provide for rebuilding an overfished stock or stock complex (if any) to a level consistent with producing the maximum sustainable yield in such fishery.

The SAFE will also report any changes to numerical estimates of MSY and OY adopted by the Council as a recommendation to NMFS as part of the biennial process described in Chapter 5.

Each SAFE report may contain additional economic, social, community, essential fish habitat, and ecological information pertinent to the success of management or the achievement of objectives of each FMP.

Each year, in June and September, the HMS Management Team will deliver one combined SAFE report for all species in this FMP to the Council. The SAFE report will follow the guidelines specified in NS 2 and will be used by the Council and NMFS to develop and evaluate regulatory adjustments under the framework procedure or the FMP amendment process. This information will provide the basis for determining annual harvest levels from each stock, documenting significant trends or changes in the resource, the bycatch, and the fishery over time, and assessing the relative success of existing state and federal fishery management programs. In addition, the SAFE report will be used to update or expand previous environmental and regulatory impact documents, and ecosystem and habitat descriptions, including EFH. The SAFE report will also make recommendations to the Council on matters concerning bycatch and incidental catch.

#### **4.4 Status of Management Unit Stocks at the Time of FMP Adoption**

... (no changes proposed to this section)

#### **4.5 Measures Adopted by the Council to End of Overfishing and Rebuild Overfished Stocks**

... (no changes proposed to this section)

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**Table 4–1. Demographic and productivity comparisons of highly migratory MUS and selected prohibited species.**

Species (yrs)	Age at Maturity (yr <sup>-1</sup> )	Fecundity (yr <sup>-1</sup> )	M <sup>1/</sup> (yrs)	Max. Age (yr <sup>-1</sup> )	Productivity ( <i>r</i> ) at B <sub>MSY</sub> <sup>2/</sup> (yr <sup>-1</sup> )	PGR <sub>3/</sub> <sup>MAX</sup> (yrs)	T <sub>D</sub> <sup>4/</sup>
<b>TUNAS</b>							
Skipjack	1	Millions (eggs)	1.50	5	0.16-0.34	0.68	2.1
Yellowfin	2.5	"	0.90	8	0.11-0.18	0.34	3.4
Bigeye	3	"	0.40	10	0.10-0.16	0.30	3.7
Albacore	4.5	"	0.30	12	0.07-0.11	0.20	5.2
Bluefin	5	"	0.25	20	0.07-0.10	0.19	5.6
<b>BILLFISHES</b>							
Str. Marlin	4	"	0.47	9	0.08-0.13	0.23	4.6
Swordfish	5	"	0.21	20	0.07-0.10	0.18	5.8
<b>SHARKS</b>							
Com.Thresh.	5	4 (pups)	0.234	19	0.04-0.07	0.12	9.2
S.F. Mako	7	6	0.160	14	0.04-0.06	0.10	10.2
Blue	6	23	0.223	20	0.04-0.06	0.10	10.4
Pel.Thresh.	9	2	0.155	29	0.02-0.04	0.07	15.0
White	9	7	0.126	36	0.02-0.04	0.07	15.8
B.E.Thresh.	13	2	0.223	20	0.02-0.03	0.05	22.7
Basking	18	3	0.136	50	0.01-0.02	0.04	27.4
<b>OTHER</b>							
Dorado	0.6	240K+ (eggs)	1.060	4	>0.34	0.97	1.4

Footnotes:

1. M is instantaneous natural mortality. All life history parameters are from Smith et al. (1998), Smith et al. (*In press* 2003), Au et al. (*In press*).
2. Productivity *r* is the potential per-capita rate of population growth per year, here at B<sub>MSY</sub>. Estimated for Tunas and Billfishes assuming that at B<sub>MSY</sub>, F<sub>MSY</sub> = 1.0M and initial fecundity increases by factor 1.00-1.25 [after Au et al. (*In press*)]; for Sharks assuming that at B<sub>MSY</sub>, F<sub>MSY</sub> = 0.5M-1.0M with fecundity not increased [after Smith et al. (*In press*)]. All figures are rounded.
3. PGR is the fractional Population Growth Rate per year. PGR<sub>MAX</sub> is the maximum rate calculated as (e<sup>2r</sup> - 1). Exploitation of the population (fraction of total population caught) greater than PGR<sub>MAX</sub> should bring population collapse, hence PGR<sub>MAX</sub> estimates maximum sustainable exploitation. The logistic model is assumed. Based on range of *r*.
4. T<sub>D</sub> is the doubling time for populations depleted to 50% of B<sub>MSY</sub> (hence the recovery time), calculated as (ln 2)/1.5r (the *r* is assumed to have increased linearly with the depletion, as per the logistic model). Based on range of *r*.

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**Table 4–2. Summary of population status of management unit species at the time of FMP adoption (see text under species descriptions for details).**

Species (Stock)	F/F <sub>MSY</sub>	Over-fishing? (>1.0?)	B <sub>MSST</sub> /B <sub>MSY</sub> (1-M)	B/B <sub>MSY</sub>	Over-fished? (<1-M?)	MinBiomass Flag Ratio (1.25(B <sub>MSST</sub> /B <sub>MSY</sub> ))	NeedAction? (B/B <sub>MSY</sub> < FlagRatio?)
TUNAS							
Albacore (NP)	0.50	N	0.70	1.10	N	0.88	N <sup>1/</sup>
Bluefin (NP)	Unkn	n	0.75	Unkn	n	0.94	n <sup>2/</sup>
Bigeye (EPO)	1.11	y	0.60	1.11	N	0.75	N <sup>3/</sup>
Skipjack (EPO)	Unkn	n	0.50	2.50 <sup>4/</sup>	N	0.63	N
Yellowfin (EPO)	~1.30 <sup>5/</sup>	Y	0.50	~0.86 <sup>5,6/</sup>	N	0.63	N
BILLFISHES							
Str. Marlin (EPO)	0.70	N	0.50	1.07	N	0.63	N <sup>7/</sup>
Swordfish (EPO)	<1.00	N	0.70	>1.00	N	0.88	N <sup>8/</sup>
SHARKS							
C.Thresher(EPO)	<1.00 <sup>9/</sup>	N	0.77	~1.10 <sup>9/</sup>	N	0.96	N <sup>10/</sup>
P.Thresher(EPO)	Unkn	?	0.85	Unkn	?	1.05	? <sup>11/</sup>
BE Thresh.(EPO)	Unkn	?	0.78	Unkn	?	0.97	? <sup>12/</sup>
Mako (EPO)	<1.00	N	0.71	>1.00	N	0.88	N <sup>13/</sup>
Blue (EPO)	<0.50	N	0.78	>1.00	N	0.97	N <sup>14/</sup>
OTHER							
Dorado (EPO)	Unkn	Unlikely	0.50	Unkn	Unlikely	0.63	N <sup>15/</sup>

**Note:** Overfishing, Overfished, and Need Action columns ask if previous column value meets criterion; e.g., under Overfishing, is the previous fraction >1.0? Less certain Y/N is y/n.

Footnotes:

1. Note that stock is now in high productivity period (NPALW 2000).
2. No evidence of stock ill health, but abundance indexes are inconclusive (Bayliff 2001).
3. Assuming a stock-recruitment relationship (Maunder and Harley 2002). See text for caveats.
4. Boggs et al. 2000.
5. From production model (Tomlinson 2001, IATTC 2000).
6. Assuming a stock-recruitment relationship, B/B<sub>MSY</sub> for 2001 could be 1.09 (Maunder 2002).
7. EPO stock has recovered (Hinton and Bayliff 2002a).
8. Per cpue patterns in EPO (Hinton and Bayliff 2002b).
9. Work in progress, D.W. Au and C. Show, SWFSC/NMFS, La Jolla, CA
10. Stock in recovery with positive population growth since 1992-94.
11. Status unknown, but catches incidental and on edge of species' broad range.
12. Status unknown, but catches incidental and possibly on edge of species' habitat.
13. Fishery takes mostly juveniles on edge of range; adults largely unavailable.
14. See text re Kleiber et al. stock assessment.
15. Highly productive and widely distributed throughout tropical/subtropical Pacific.

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**Table 4-3. Stockwide and regional (CA, OR, WA) catches in thousand (K) mt for management unit species at the time of FMP adoption, with respect to MSY, sustainability, and regional harvest guidelines.**

Species (Stock)	MSY (or proxy)	OY (or proxy)	Catches (K mt round wgt, 1995-99 period)			Status		
			Stock-wide	Regional		Regional Catch		Harvest Guideline
				Comm'l	Rec'l	Fract'n	Sust'l?	
<b>1. TUNAS</b>								
Albacore (NP)	120 <sup>1/</sup>	(120)	67-128 <sup>2/</sup>	10-18	<0.05-1.31	0.16	Y	
Bluefin (NP)	(20) <sup>3/</sup>	(15)	13-24 <sup>4/</sup>	<1-5	<0.05	0.10	Y	
Bigeye (EPO)	79 <sup>5/</sup>	(79)	64-94 <sup>4/</sup>	#0.1		<0.01	Y	
Yellowfin (EPO)	270 <sup>6/</sup>	(270)	244-306 <sup>4/</sup>	1-6	0.12-0.84	0.01	Y	
Skipjack (EPO)	(190) <sup>3/</sup>	(190)	137-295 <sup>4/</sup>	4-7	<0.1	0.03	Y	
<b>2. BILLFISH ES</b>								
Str. Marlin (EPO)	4.5 <sup>7/</sup>	(3.4)	2-4 <sup>7/</sup>	<0.02	0.03	0.01	Y	
Swordfish (EPO)	(12.5) <sup>8/</sup>	(12.5)	8-15 <sup>4/</sup>	1-2	<0.01	0.12	Y	
<b>3. SHARKS</b>								
Cm Thresher(Reg'l)	(0.45) <sup>9/</sup>	(0.34)	Unkn	0.27-0.33	0.01-0.06	?	Y	0.34 <sup>10/</sup>
PI Thresher(Reg'l)	(0.020) <sup>11/</sup>	(0.015)	Unkn	0.004 <sup>12/</sup>		?	y	
BE Thresher(Reg'l)	(0.04) <sup>13/</sup>	(0.03)	Unkn	0.01-0.03		?	y	
Mako/Bonito(Reg'l)	(0.20) <sup>14/</sup>	(0.15)	Unkn	0.06-0.13	0.01-0.08	?	Y	0.15 <sup>10/</sup>
Blue (NP)	~120 <sup>15/</sup>	(90)	>50 <sup>16/</sup>	0.08-0.17 <sup>17/</sup>	<0.03	<0.01	Y	
<b>4. OTHER</b>								
Dorado (EPO)	(0.45) <sup>3/</sup>	(0.45)	0.22-0.56 <sup>18/</sup>	<0.01-0.04	<0.01-0.08	0.04	Y	

**MSY:** from catch-effort relationships, unless a proxy. **Proxy MSY:** average stock-wide catches over appropriate years or (minimal) local (West Coast) MSYs (LMSY) including local average levels of catch. **OY:** equal to MSY or to 0.75MSY (bluefin tuna, str. marlin, sharks). **Stock-wide Catch:** 1995-99 catches. **Regional Commercial Catches:** 1995-99 West Coast catches from PacFIN data base (Table 2-1); also drift gillnet catches (str. marlin, blue shark) extrapolated from SWFSC Observer Records, 1995-99. Except for albacore, these catches are mainly from within the EEZ. **Regional Recreational Catch:** CPFV (Table 2-57) and RECFIN (Table 2-58) data, and assuming 12.9kg/bluefin, 7.1kg/yellowfin, 2.4kg/skipjack, 7.3kg/albacore, 6.5kg/dorado, 113kg/swordfish, 16.7kg/mako, and 28.1kg/thresher; also, assuming 59kg/str. marlin, 300 sport-caught fish/yr. **Status:** Less certain Y/N is y/n re sustainability. **Harvest Guideline:** for shark species of regional/local concern; equal to the OY proxy.

Footnotes

1. Average MSY over low and high productivity periods (Bartoo and Shiohama 1985, NPALW 2000). See text.
2. NPALW 2000
3. Mean of 1995-99 stock-wide catches.
4. IATTC 2001
5. MSY between 66 and 92 K mt from production models (IATTC 2000).
6. From production model (Tomlinson 2001, IATTC 2000).
7. MSY and catches from Hinton and Bayliff (2002a).
8. Average of 1995-99 catches; an analytically derived MSY is pending.
9. LMSY proxy by Population Growth Rate (PGR) method; is a minimal estimate of MSY (see text).
10. The OY proxy = 0.75MSY.
11. LMSY proxy as average catch during strong El Niño years (here 1983, 1984, and 1997) when species presence became significant.
12. Average catch 1995-99 excluding 1997 (strong El Niño year).
13. Average catch 1982-99.
14. LMSY proxy as average 1981-1999 regional catch; is a minimal estimate of MSY (see text).
15. After Kleiber et al. (see text).
16. Estimated N. Pacific catches after Nakano and Seki (MS) (see text).

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- 17. Catches from SWFSC DGN observer data base, plus other fisheries landings (Tables 2-1,2-40, 2-42). No data on LL bycatches.
- 18. FAO Area 77 catches.

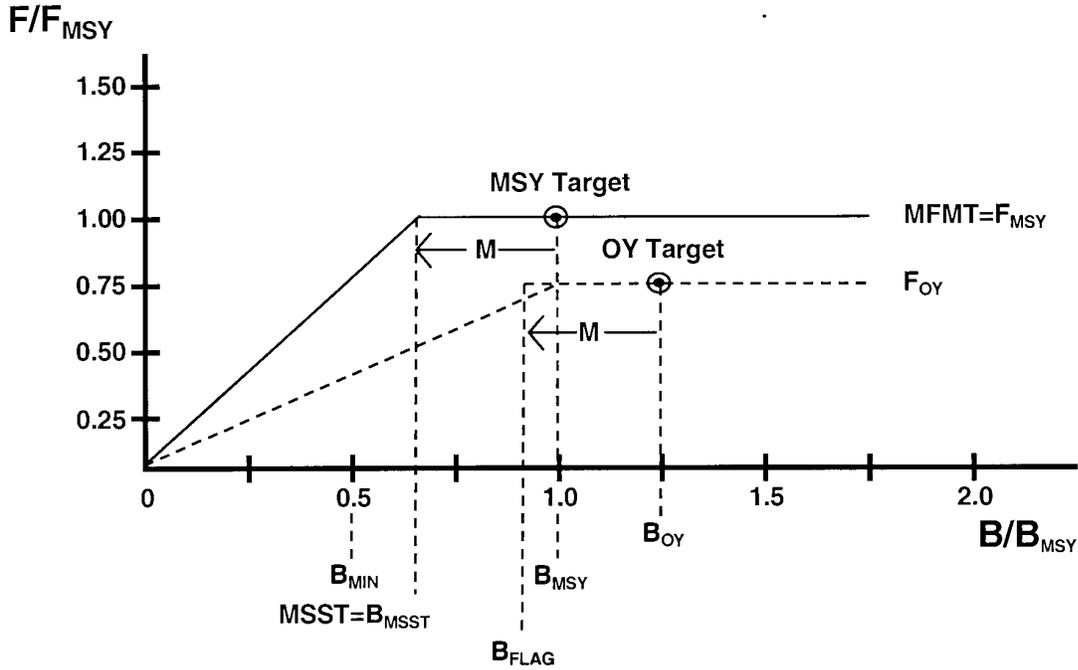
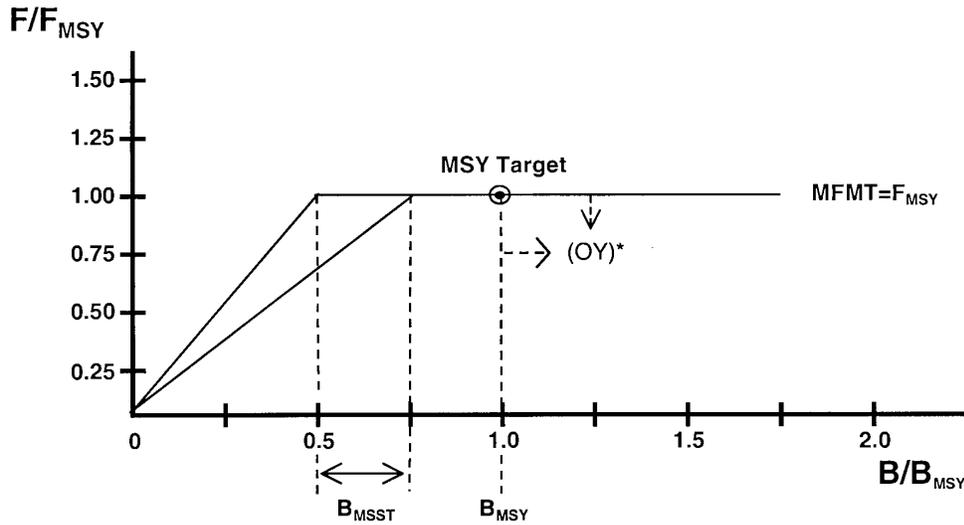
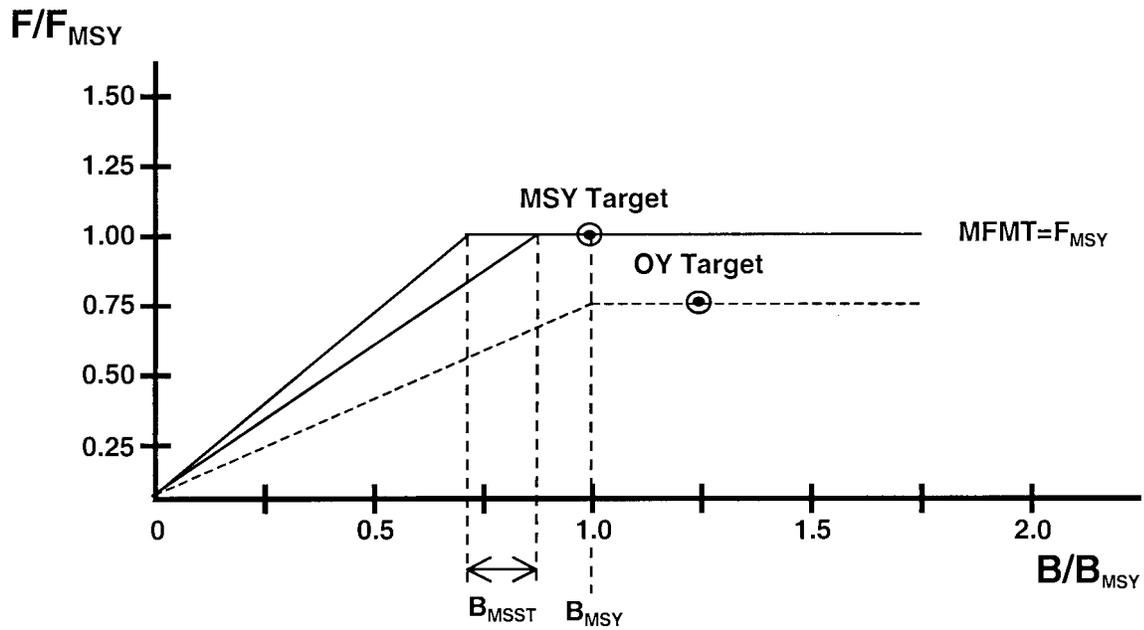


Figure 4-1. General model of maximum sustainable yield and optimum yield control rules, according to Restrepo et al. (1998).



[N.B. This figure deleted.]

Figure 4 2. MSY control rules for tunas and billfishes.



[N.B. This figure deleted.]

Figure 4 3. General MSY control rule for sharks, with an OY example.

## **5.0 PERIODIC BIENNIAL PROCESS FOR SPECIFYING/ADJUSTING/REMOVING MANAGEMENT REFERENCE POINTS AND MANAGEMENT MEASURES**

### **5.1 Framework Procedures**

Many fishery management plans under the Magnuson-Stevens Act use framework procedures by which flexible management, within the scope and criteria established by the FMP and implementing regulations, can be implemented without amending the FMP. Framework actions can usually be implemented more quickly than FMP amendments, allowing for more timely management response.

Such flexible management measures may be imposed, adjusted, or removed at any time during the year, or according to an established management cycle. Management measures may be imposed for resource conservation, or social or economic reasons consistent with FMP procedures, goals and objectives.

This process also may be used to identify, adopt, and review revised estimates of MSY, OY, and any related SDC based on the best scientific information. Table 4-3 shows estimates of MSY and OY at the time the FMP was originally approved. Any revised estimates, after NMFS review and approval, would be published in the next SAFE document and used for management, as appropriate.

Analyses of biological, ecological, social, and economic impacts will be considered when a particular change is proposed. As a result, the time required to take action will vary depending on the type of action, its impacts on the fisheries, resources, and environment, and the review of these impacts by interested parties. Satisfaction of legal requirements under other applicable laws (e.g., Administrative Procedure Act, National Environmental Policy Act, Regulatory Flexibility Act, Executive Order 12866, etc.) for actions taken under framework procedures generally requires analysis and public comment before the measures may be implemented by the Secretary of Commerce.

#### Types of Framework Actions

Under most framework procedures, management measures may be established, adjusted or removed using the following categories of actions:

- “Automatic” actions such as quota closures, which are nondiscretionary and must have already been analyzed in advance. Automatic actions may be made effective immediately in a single *Federal Register* notice, if there are adequate grounds for appropriate waivers of prior opportunity for public notice and comment, and the cooling-off period, as provided in the Administrative Procedure Act.
- “Notice” actions requiring at least one Council meeting and one *Federal Register* notice. These are management actions other than “automatic” actions that are either nondiscretionary or within the scope of a previous analysis. An example of a “notice” action might be a change in the incidental catch allowance per trip for non-HMS gears. Notice actions may be made effective immediately in a single *Federal Register* notice, if there are adequate grounds for appropriate waivers of prior opportunity for public notice and comment, and the cooling-off period, as provided in the Administrative Procedure Act.
- “Abbreviated Rulemaking” actions normally requiring at least two Council meetings and one *Federal Register* notice. Abbreviated rulemaking would be used only when time is insufficient to use the full rulemaking process. Abbreviated rulemaking actions may be made effective immediately in a single *Federal Register* notice, if there are adequate grounds for appropriate waivers of prior opportunity for public notice and comment, and the cooling-off period, as provided in the Administrative Procedure Act.

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- “Full Rulemaking” (regulatory amendments or adjustments to change management rules) requiring at least two Council meetings and two *Federal Register* notices consisting of proposed and final rules. These include any proposed management measures not falling within the other categories, including measures that are highly controversial or that directly allocate a resource.

These procedures would not affect the authority of the Secretary of Commerce to take emergency regulatory action under Section 305(c) or (d) of the Magnuson-Stevens Act.

### Framework Process for Rulemaking Actions

New measures or changes to measures may be implemented for one or more fisheries for HMS in the Pacific Council area through the framework procedures. The objective is efficiency and timeliness in management.

Reasons for adopting these framework measures may include, but are not limited to, the following:

- to implement U.S. obligations under an international agreement;
- to achieve optimum yield and prevent overfishing;
- to respond to a determination that overfishing is occurring;
- to minimize adverse impacts of fishing on EFH;
- to minimize bycatch and bycatch mortality;
- to reduce adverse effects of fisheries on protected resources and promote the recovery of any species listed under ESA.
- to promote vessel safety;
- to reduce conflict and provide for orderly fisheries;
- to allocate among domestic HMS fisheries;
- to address social or economic issues;
- to facilitate management of the fisheries;
- to meet goals and objectives of the FMP;
- to respond to changes in management of HMS in other areas of the Pacific.

The following types of measures are authorized to be established, adjusted, or removed using this framework process, without amending the FMP:

- time/area restrictions;
- reporting requirements;
- permits or licenses (for commercial harvesters or vessels, for recreational harvesters or vessels, and for processors) and endorsements for individual fisheries;
- ABCs, ACLs, ACTs, quotas, or harvest guidelines;
- fish length limits;
- recreational daily catch (bag) limits;
- trip limits;
- gear restrictions;
- changes to definition of legal gear;
- allocations among U.S. West Coast fisheries;
- at-sea observers;
- vessel monitoring systems (VMS);
- adjustments to descriptions of EFH and designation of habitat areas of particular concern;
- measures to minimize bycatch or minimize mortality of bycatch;
- measures to minimize interactions with protected species, including, but not limited to, implementation of federal biological opinions and court rulings.

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In addition, the Council may adopt changes to numerical estimates of reference points, including MSY, OY, and SDC including OFLs. Any adopted changes to estimates of MSY or OY will be forwarded to the Secretary as a recommendation, consistent with the appropriate framework action among those described above. If an organization, established pursuant to an international agreement to which the United States participates, identifies reference points for any stock managed under this FMP the Council would normally identify those reference points as appropriate for management. Any determination of the appropriateness of the use of such reference points for management would be based on the best scientific information available.

General Procedure. Following an established management cycle which includes production of an annual Stock Assessment and Fishery Evaluation (SAFE) report, the HMS Management Team, HMS Advisory Subpanel, or other Council advisory body, or a member of the public, may identify a problem and request regulatory action. If the Council agrees that regulations may be necessary, it will direct the HMS Management Team and/or staff to prepare a draft document which includes a description of the problem, ~~alternative-proposed~~ management actions and analysis ~~of the impacts of the alternatives.~~ Any The documentation must comply with ~~will be in the form of an environmental impact statement or environmental assessment/regulatory impact review/regulatory flexibility analysis which meets the~~ analytical requirements of NEPA, Executive Order 12866, the Regulatory Flexibility Act, the Magnuson-Stevens Act and other applicable law. Through internal scoping NMFS and the Council will determine the form and content of this analytical document.

Upon completion, the draft document will be made available to the interested public and will be addressed by the Council at a subsequent meeting. The issue will be placed on the subsequent meeting agenda, which will be distributed to the media and interested public and published in the *Federal Register*. The Council will seek to identify all interested persons and organizations and solicit their involvement in discussion and resolution of this problem through the Council process. If the action involves a fishery that extends beyond the EEZ, the Council shall invite comments from the Western Pacific and North Pacific Fishery Management Councils on the action that may affect those councils' fisheries. After receipt of comment from its advisory entities and the public, the Council will decide whether or not to adopt the draft document for public comment.

If the Council decides to proceed with the issue, it will revise the draft document as necessary and make it available for public comment. The issue will be placed on the agenda for a subsequent meeting, which will be distributed to the media and interested public and published in the *Federal Register*. At this meeting, after receipt of comment from its advisory entities and the public, the Council will adopt a measure or package of measures for submission to NMFS for approval. A final document including the Council action and rationale will be prepared and submitted to NMFS. The document will specifically indicate whether there will be any impacts on HMS fishery interests in areas of concern of other fishery management councils. If another council has commented on the proposed action, a copy of those comments will be included in the submission.

Point-of-Concern Framework Procedure. The point-of-concern procedure is an additional tool for the Council's use in exercising resource stewardship. The process is intended to foster continuous and vigilant review of Pacific HMS stocks and fisheries. Point-of-concern criteria are intended to assist the Council in determining when a focused review of a particular species is warranted and if management measures are required. The Council has the authority to act solely on a point-of-concern. The point-of-concern framework is intended to be complementary to the work by the HMS Management Team to monitor the fisheries throughout the year. A point-of-concern must be raised to the Chair of the Council in writing, including rationale, background and supporting data.

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A point-of-concern occurs when one or more of the following is found or expected:

- Catch has exceeded an ACL based on annual or multi-year average data
- Catch is projected to exceed, within two years, the current ACLs, harvest guidelines, or quotas based on current exploitation rates;
- Developments in a foreign fishery or actions required under an international management framework affect the likelihood of overfishing HMS domestically;
- Estimated bycatch of a species or species group increases significantly above previous estimates, or there is information that abundance of a bycatch species has declined significantly;
- New information is discovered on the biological characteristics of one or more species, or on the characteristics of a stock, indicating that current management measures are inadequate;
- An error in data or stock assessment is detected that significantly changes the estimates of impacts of current management;
- MSY control rule parameters or approach require modification;
- Projected catches for a non-management unit HMS species increase substantially such that applying the default control rule to that species would show catches exceeding the Allowable Biological Catch. This could require moving a species into the management unit;
- Changes in ecological relationships, such as significant shifts in predator-prey interactions or declines in forage species, indicate that an HMS population may be in decline.

If a point-of-concern is raised to Chair of the Council, the Council shall decide if the HMS Management Team (HMSMT) should proceed to address the concern, and/or if any additional actions are warranted by the Council at that time. Notwithstanding, if an ACL is exceeded the Council must implement accountability measures as soon as possible to correct the operational issue that caused the ACL overage.

If so directed by the Council, the HMSMT will prepare a report including recommendations, rationale, and analysis for appropriate management measures to resolve the point-of-concern. After receiving the HMSMT report, the Council will hear public testimony and, if appropriate, recommend management measures to the NMFS Regional Administrator accompanied by supporting rationale and analysis of impacts. The Council analysis will include a description of (a) resource conservation or ecological issues consistent with FMP objectives; (b) likely impacts on other management measures, other fisheries, and bycatch; and c) socioeconomic impacts to commercial and recreational segments of the HMS fishery. The recommendation will also explain the urgency of the measure(s), if any.

The NMFS Regional Administrator will review the Council's recommendation and supporting information and will follow the appropriate implementation process. If the NMFS Regional Administrator does not concur with the Council's recommendation, the Council will be notified in writing of the reasons for the rejection.

The same framework procedures would be used during the management cycle for changing conservation and management measures, except there would be no point-of-concern criteria for raising conservation concerns to the Council.

### **5.2 Management Cycle**

The management cycle is a pre-determined regular schedule for council management actions with respect to HMS fisheries. Cycle differences affect the time available for fishery assessments, the timeliness of available data and of management response, and the degree to which fishers can participate in the management process.

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Future developments in the fisheries do not ordinarily bring need for change in the management cycle schedule, and the management cycle is thus a fixed element of the FMP. However, should there be need to change the management schedule, e.g., because of marked changes in fishery practices, the Council can do so by vote and without a plan amendment, provided the Council gives six-month notice.

The FMP establishes a *biennial* management cycle with regulatory/statistical year *April 1 to March 31*. The schedule would be as follows:

### Year 1

- |           |   |
|-----------|---|
| June      | Provide update to the Council on status of the HMS fisheries <u>and, as appropriate, proposed adjustments to the numerical estimates of MSY, OY, and SDC in a preliminary SAFE report. If necessary, Council directs HMSMT to prepare draft regulatory analysis to implement revised estimates of reference point values, ACLs or other harvest objectives levels and/or management measures.</u> |
| September | Annual SAFE document presented to Council. If necessary, Council directs HMSMT to prepare a draft regulatory analysis to implement <u>revised estimates of reference point values, ACLs or other new harvest levels objectives, and/or management measures.</u> Council adopts for public review proposed actions addressing concerns from current and previous SAFE reports.                     |
| November  | Council adopts final action and submits to NMFS for approval.   |

### Year 2

- |       |   |
|-------|---|
| April | Measures become effective, and stay in effect for at least two years. |
|-------|---|

The SAFE document in Year 2, after NMFS review and approval, publishes any revised estimates of reference point values, including ACLs or other harvest objectives (e.g., a harvest guideline) previously adopted by the Council.

This schedule allows at least minimally sufficient time for data analysis, provides for timely response to fishery problems, and allows most fishers adequate access to the management process, as scheduled.

The cycle is repeated biennially, with new actions considered in September and becoming effective in April every other year. The Council would schedule HMS for the June, September, and November Council meetings.

Under this biennial cycle (or any cycle), the HMS management team would still conduct ongoing reviews of the fisheries and status of stocks and prepare an annual SAFE document for the Council. The Council would still have to prepare a stock rebuilding plan within ~~one~~ two years of notification by the Secretary of Commerce that a stock not subject to management under an international agreement to which the United States is party has been declared overfished, as called for under the Magnuson-Stevens Act (Section 2.3). **[NB- References to the previous one year deadline and response to international overfishing elsewhere in the FMP will be revised accordingly to reflect MSRA changes.]**

### **5.3 Procedure for Making Recommendations to Regional Fishery Management Organizations**

The Council may develop an Operating Procedure to facilitate effective coordination and communication of management advice, in concert with the WPFMC and through the appropriate U.S. delegation, between the Councils and RFMOs involved in HMS management in the Pacific Ocean. The Operating Procedure may include specific decision-making schedules and criteria in order to harmonize PFMC, WPFMC, and RFMO processes.