UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
PROGRAM PLANNING AND INTEGRATION
Silver Spring, Maryland 20910

MAY 25 2012

To All Interested Government Agencies and Public Groups:

Under the National Environmental Policy Act, an environmental review has been performed on the following action.

TITLE: Annual Specifications for the 2011-2012 Pacific Mackerel Fishing Season – RIN 0648- XB045

LOCATION: Exclusive Economic Zone off the U.S. West Coast

SUMMARY: NMFS implements the annual catch limit (ACL), harvest guideline (HG), annual catch target and associated annual reference points for Pacific mackerel in the U.S. exclusive economic zone off the Pacific coast for the fishing season of July 1, 2011, through June 30, 2012. This rule is proposed according to the Coastal Pelagic Species (CPS) Fishery Management Plan (FMP). This is a routine action.

RESPONSIBLE OFFICIAL: Rodney R. McInnis, Southwest Regional Administrator
National Marine Fisheries Service
National Oceanic and Atmospheric Administration (NOAA)
501 W. Ocean Blvd. Ste 4200
Long Beach, CA, 90802
562-980-4034

The environmental review process led us to conclude that this action will not have a significant impact on the environment. Therefore, an environmental impact statement was not prepared. A copy of the finding of no significant impact (FONSI), including the environmental assessment, is enclosed for your information.

Although NOAA is not soliciting comments on this completed EA/FONSI we will consider any comments submitted that would assist us in preparing future NEPA documents. Please submit any written comments to the Responsible Official named above.

Sincerely,

Patricia A. Montanio
NEPA Coordinator

Enclosure

ENVIRONMENTAL ASSESSMENT
AND
REGULATORY IMPACT REVIEW

PACIFIC MACKEREL HARVEST SPECIFICATIONS
2011/12 FISHING SEASON

National Marine Fisheries Service
Southwest Region
501 W. Ocean Blvd., Suite 4200
Long Beach, California 90802

May 2012

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1.0 Summary

This document describes the environmental effects of the annual specifications and management measures for Pacific mackerel for the fishing season July1 through June 30. The annual overfishing limit (OFL), acceptable biological catch (ABC), annual catch limit (ACL), and harvest guideline (HG) or annual catch target (ACT) are established using the current estimated Pacific mackerel biomass applied to the formulas and sustainable yield criteria in the fishery management plan (FMP). The harvest strategy approved each year must meet predetermined criteria that are carefully selected to avoid adverse effects to the fishery resource and recognizing that the biomass of Pacific mackerel, along with the economic impacts to fishermen and communities dependent on the resource, fluctuates naturally from year to year. The method and effects for determining the annual catch amounts were analyzed in 1998 as a supplemental environmental impact statement for Amendment 8 to the Coastal Pelagic Species Fishery Management Plan (CPS FMP, PFMC 1998) as well as the Environmental Assessment for Amendment 13 to the CPS FMP.

2.0 Purpose and Need

The purpose of the proposed action is to conserve and manage the U.S. Pacific mackerel fishery resource in order to prevent overfishing, to ensure conservation, to facilitate long-term protection of essential fish habitat, and to realize the full potential of the Nation's fishery resources (MSA§2(a)(6)). In order to achieve this purpose, it is necessary to establish the annual harvest limits and targets and associated management measures for Pacific mackerel, as set forth in the CPS FMP. The need for the proposed action is to implement these harvest limits as required by the FMP for Pacific mackerel through application of formulas that utilize an estimate of biomass and specific conservation criteria. The FMP requires NMFS to announce these limits, including the directed commercial fishing limit or HG, as soon as practicable before the beginning of the fishing season on July1 of each year. These limits and HG are established based on the best scientific information available and derived according to the required formula. They are intended to protect Pacific mackerel from overharvest and recognize the role as forage by limiting the directed commercial harvest of Pacific mackerel while, at the same time, providing long-term harvest potential for the fishing industry.

3.0 Background

Like all members of its family the Pacific mackerel (*Scomber japonicus*) is a pelagic, schooling fish with erratic migratory habits (Fitch 1956). Pacific mackerel in the northeastern Pacific Ocean range from southeastern Alaska to Banderas Bay (Puerto Vallarta), Mexico, including the Gulf of California. The fish are common from Monterey Bay, California, to Cabo San Lucas, Baja California, but are most abundant south of Point Conception, California. There are possibly three spawning 'stocks' along the Pacific coasts of the USA and Mexico: one in the Gulf of California; one in the vicinity of Cabo San Lucas; and one along the Pacific coast north of Punta Abreojos, Baja California and extending north to waters off southern California and further, off the Pacific Northwest depending on oceanographic conditions. This latter sub-stock, the 'northeastern Pacific Ocean' population, is harvested by fishermen in the USA and Baja California, Mexico, and is the population considered in this assessment. More information on current Pacific mackerel abundance and population trends is available in the current CPS SAFE Report.

Before 1928, Pacific mackerel was taken incidentally with sardines and sold as fresh fish (Frey 1971). As markets developed for canned Pacific makerel, this species supported one of California's major fisheries during the 1930s and 1940s. But by the mid-1960s Pacific mackerel was a depleted stock. After a decade of virtual economic extinction, a series of successful spawns in the mid-1970s restored the fishery to levels of the early 1940s. Subsequent to the collapse, regulation efforts culminated in the first Pacific mackerel management measure - a commercial fishing moratorium. Fishery and management developments during the years of resurgence were complicated by the incidental catch of Pacific mackerel in the jack mackerel fishery and by the difficulty of accurately assessing the biomass of Pacific mackerel (Klingbeil 1983).

Following the period of 'recovery' that spanned from the mid to late 1970s, the moratorium was lifted and subsequently, through the 1990s, the fishery ranked third in volume for finfish landed in California. During this time, the market for canned mackerel fluctuated due to availability and economic conditions. Domestic demand for canned Pacific mackerel eventually waned and the last mackerel cannery in California closed in 1992. At present, most Pacific mackerel is used for human consumption or pet food, with a small, but increasing amount sold as fresh fish.

As adults, Pacific mackerel move north in summer and south in winter between Washington and Baja California (Fry and Roedel 1949; Roedel 1949), with northerly movement in the summer accentuated during El Niño events (MBC 1987). There is an 'inshore-offshore' migration off California, with increased inshore abundance from July to November and increased offshore abundance from March to May (Cannon 1967; MBC 1987). Adult Pacific mackerel are commonly found near shallow banks. Juveniles are found off sandy beaches, around kelp beds, and in open bays. Adults are found from the surface to 300 m depth (Allen et al. 1990). Pacific mackerel often school with other coastal pelagic species (CPS), particularly jack mackerel and Pacific sardine, and likely based on age-dependent attributes as well (Parrish and MacCall 1978).

Over the last few decades, the stock has likely more fully occupied the northernmost portions of its range in response to a warm oceanographic regime in the northeastern Pacific Ocean, with further evidence, given Pacific mackerel have been found as far north as British Columbia, Canada (Ware and Hargreaves 1993; Hargreaves and Hungar 1995). During the summer months, Pacific mackerel are commonly caught incidentally in commercial whiting and salmon fisheries off the Pacific Northwest, but historically, these catches have been limited. Pacific mackerel sampled from Pacific Northwest incidental fisheries are generally older and larger than those captured in the southern California fishery (Hill 1999).

Stocks in the CPS FMP are classified under the following management categories: actively managed; monitored; and prohibited harvest species. The CPS FMP is based on a management framework designed to react quickly to changes in the fisheries and/or stocks, with the CPSMT providing advice on classification changes in accordance with fishery/stock dynamics. The following table lists the stocks currently managed under the CPS FMP.

Management Category	Common Name	**Scientific Name**
Actively Managed	Pacific sardine	*Sardinops sagax*
	Pacific (chub) mackerel	*Scomber japonicus*
Monitored	Northern anchovy Central and Northern Subpopulations	*Engraulis mordax*
	Market squid	*Loligo opalescens*
	Jack mackerel	*Trachurus symmetricus*
Prohibited Harvest	Krill or Euphausiids All West Coast EEZ Species Eight dominant species First two species are common and are the most vulnerable to fishing.	*Euphausia pacifica* *Thysanoessa spinifera* *Nyctiphanes simplex* *Nematocelis difficilis* *T. gregaria* *E. recurva* *E. gibboides* *E. eximia*

Harvest guidelines for the two actively managed species (Pacific sardine and Pacific mackerel) are based on formulas incorporating current biomass estimates. Annual biomass estimates are not made for the three monitored species (jack mackerel, northern anchovy, and market squid). During public meetings each year, the biomass for each actively managed species within the CPS FMP is presented to the Pacific Fishery Management Council's (Council) CPS Management Team (Team), the Council's CPS Advisory Subpanel (Subpanel) and the Council's Scientific and Statistical Committee (SSC). At that time, the biomass, the potential OFL, and the status of the fisheries are reviewed and discussed. This information then is presented to the Council along with HG recommendations and comments from the Team, Subpanel and SSC. Following review by the Council and after hearing public comment, the Council makes its OFL, ABC, ACL and HG or ACT recommendation to NMFS.

If these harvest limits are found to be consistent with the Magnuson-Steven Act and other applicable law, including the Endangered Species Act (ESA), NMFS implements the management measures. The harvest limits apply to the exclusive economic zone (EEZ), between 3 and 200 nautical miles off shore. The annual harvest limits and season structure are published by NMFS in the Federal Register as soon as practicable before the beginning of the fishing season. The Pacific mackerel season begins on July 1 and ends on June 30 of each year. The fishery begins whether regulations are in place or not, however NMFS does not have the ability to close the fishery without published regulations.

3.1 Management Measures

The state of California first applied management measures to Pacific mackerel in 1970, after the stock had collapsed in the mid-1960s. A moratorium was placed on the fishery at this time, with a small allowance for incidental catch in mixed-fish landings. In 1972, legislation was enacted that imposed a landing quota based on the estimate of age-1+ (>1-yr old fish) biomass generated from formal assessments. A couple of very strong year classes in the late 1970s triggered a stock recovery (increase in total abundance), which was followed by the fishery being reopened under a quota system in 1977.

During the span of the recovery period from 1977 to 1985, various adjustments were made to quotas for directed take of Pacific mackerel and to incidental catch limits, i.e., even during the 'moratorium' substantial allowances were made for incidental catches associated with this species (Parrish and MacCall 1978). A federal fishery management plant (FMP) for coastal pelagic species, including Pacific mackerel, was implemented by the Pacific Fishery Management Council (PFMC) in January 2000 (PFMC 1998).

Pacific mackerel is managed under an FMP harvest policy, stipulating the following harvest control rule:

HARVEST = (BIOMASS-CUTOFF) • FRACTION • DISTRIBUTION,

where HARVEST is the harvest guideline (HG), BIOMASS is age 1+ stock biomass (mt) in the current assessment year (211,126 mt on July 1, 2011), CUTOFF (18,200 mt) is the lowest level of estimated biomass at which harvest is allowed, FRACTION (30%) is the proportion of biomass above the CUTOFF that can be harvested by fisheries, and DISTRIBUTION (70%) is the average fraction of total BIOMASS (ages 1+) assumed in USA waters (PFMC 1998).

The purpose of CUTOFF is to protect the stock when biomass is low. The purpose of FRACTION is to specify how much of the stock is available to the fishery when BIOMASS exceeds CUTOFF. The DISTRIBUTION term reduces the HG if the stock ranges beyond U.S. waters and, therefore, is subject to foreign fisheries. In addition to the CUTOFF and FRACTION parameters, another tool in the CPS FMP is to define a maximum harvest level parameter (MAXCAT) in order to protect against extremely high catch levels due to errors in estimating biomass, to reduce year-to-year variation in catch levels, and to avoid overcapitalization during short periods of high biomass and high harvest. Incorporating an upper threshold in this manner prevents the catch from exceeding MSY at high stock levels and distributes the catch from strong year classes across a wider range of fishing seasons. However, no MAXCAT is defined for Pacific mackerel, given the U.S. fishery appears to be limited by markets and resource availability to about 40,000 mt per year; in the event landings increase substantially, then the need for such a cap could be revisited. The target harvest level is defined for the entire stock in Mexico, Canada, and U.S. waters (i.e., not just the U.S. portion), and the U.S. target harvest level is prorated based on 70% relative abundance in U.S. waters.

BIOMASS is an estimate only; it is never assumed that BIOMASS is a perfect measure of abundance. In fact, levels of measurement error in BIOMASS typically have CVs of about 50 percent for CPS, an aspect that was included in the development of the current harvest guideline control rule.

The general HG formula for CPS is useful for lower trophic level species like CPS because it puts an emphasis on maintaining high biomass versus high catch. If the CUTOFF is greater than zero, then the harvest rate (H/BIOMASS) declines as biomass declines. By the time BIOMASS falls as low as CUTOFF, the harvest rate is reduced to zero. The CUTOFF provides a buffer of spawning stock that is protected from fishing and available for use in rebuilding should a stock become overfished. The combination of a spawning biomass buffer equal to CUTOFF and reduced harvest rates at low biomass levels means that a rebuilding program for overfished stocks is defined implicitly. Moreover, the harvest rate never increases above FRACTION. If FRACTION is approximately equal to F_{MSY}, then the harvest control rule harvest rate will not exceed F_{MSY}.

The calculation of the HG formula under the FMP is applied to a July-June fishing 'year'. The result of the HG formula averaged roughly 15,000 mt from 2001-06. In 2007, it increased to over 70,000 mt based largely on assumptions regarding variability surrounding estimated recruitment, and averaged around 54,000 mt from 2008-2010. However during this time period, 2007-2010, the Council recommended, and NMFS implemented, HGs lower than those calculated from the control rule. This was based on uncertainties surrounding the model estimating biomass and the assumption that the fishery is market limited to 40,000 mt. It is important to note that over the last decade, from a management context, the fishery has not fully utilized HGs, with landings rarely exceeding 20,000 mt over the last 20 years and averaging approximately 6,000 mt in the last 10 years.

In 2011, Amendment 13 to the CPS FMP was adopted to ensure the FMP was consistent with advisory guidelines published at 50 CFR 600.310 with respect to a process for setting ACLs and accountability measures (AMs) and clarifying management unit species (MUS) and ecosystem component species (EC). Amendment 13 modified management measures to include the specification of new reference points such as ACLs. This included the process for annually setting ACLs and associated AMs, as well as other provisions for preventing overfishing, such as the potential of setting ACTs.

Specifically, Amendment 13 revised the framework process to set and adjust fishery specification and management measures and established a framework for specifying new reference points such as ACLs and AMs, as well as other provisions for preventing overfishing such as setting OFLs, ABCs and the potential setting of annual catch targets (ACTs).

The formulas established by Amendment 13 for actively managed species such as Pacific mackerel are shown in the table below.

OFL	BIOMASS * F_{MSY} * DISTRIBUTION
ABC	BIOMASS * BUFFER * F_{MSY} * DISTRIBUTION
ACL	LESS THAN OR EQUAL TO ABC
HG	(BIOMASS - CUTOFF) * FRACTION * DISTRIBUTION.
ACT	EQUAL TO HG OR ACL, WHICHEVER VALUE IS LESS

The OFL is an annual catch amount that corresponds to the estimate of (annual) MSY fishing mortality. The OFL is expressed in terms of numbers or weight of fish; overfishing occurs if catch exceeds the OFL. For Pacific mackerel, the OFL is based on the MSY proxy harvest rate guided by the best available scientific information and the best available biomass estimate. Additionally, because a portion of the mackerel population is in foreign waters, the OFL is adjusted using a DISTRIBUTION to estimate the percentage of the population in the U.S. EEZ.

The ABC is a harvest specification set below the OFL and is a threshold that incorporates a scientific uncertainty buffer against overfishing (i.e., exceeding the OFL). Based on the preferred level of overfishing risk aversion, the SSC recommends an ABC for the Council's decision. The ABC incorporates a percentage reduction of the OFL selected according to an SSC determination on scientific uncertainty and a risk policy determined by the Council. In cases where scientific uncertainty (σ) associated with estimating an OFL is quantified by the SSC, the percentage reduction that defines the scientific uncertainty buffer and the ABC can be determined by translating the estimated σ to a range of probability of overfishing (Pstar) values. The Council then determines the preferred level of risk aversion by selecting an appropriate Pstar value, and the Pstar value is matched to its corresponding BUFFER fraction. The BUFFER fraction then is applied to the OFL according to the ABC control rule.
An ACL is the level of annual catch of a population or population complex that if met or exceeded triggers accountability measures, such as a seasonal closure or quota closure. The Pacific mackerel fishery is managed to keep total catch from all sources below the ACL. ACLs are set no higher than ABC, and the HG cannot exceed the ACL or ABC. In cases where the result of the HG formula exceeds the ABC, the Council will set a lower ACL, HG, or ACT in response. Along with OY considerations, an HG or ACT may be utilized below an ACL or sector-specific ACL to account for management uncertainty, discard or bycatch mortality, and research take. These provisions will be considered on an annual basis in response to changing resource status and fishery dynamics.

Along with the setting of HGs or ACTs below the ACL, accountability measures (AMs) are in place, such as inseason management controls and post-season review processes, to prevent ACLs from being exceeded and to correct or mitigate overages of the ACL if they occur.

3.2 Current Management Measures in place to reduce bycatch and protected species interactions

Bycatch in CPS fisheries is minimal because fishing operations generally target aggregations of coastal pelagic species. Incidental catch allowances are designed to reduce bycatch in those instances in which Pacific mackerel is mixed in schools of Pacific sardine, jack mackerel, and other CPS following closure of the Pacific mackerel directed fishery.

Bycatch, incidental catch, and interactions with protected species are monitored through dockside sampling, logbooks, and occasional observer programs of the CPS fishery. Interactions are reported annually in the CPS SAFE. NMFS has conducted consultations on sea birds, marine mammals, and fish stocks with no findings that fishing activities are likely to jeopardize protected species. Reporting requirements and/or conservation measures are in place to avoid interactions with sea otters.

CPS vessels use roundhaul gear (purse seine or lampara nets of approximately one-half mile in total length). These are encircling type nets, which are deployed around a school of fish or part of a school. Roundhaul fishing results in little unintentionally caught fish, primarily because the fishermen target a specific school, which usually consists of one species. Fish tend to school by size, so if another species is present in the school, it is typically similar in size. The most common incidental catch in the CPS fishery is another CPS species (e.g., Pacific mackerel incidental to the Pacific sardine fishery). If larger fish are in the net, they can be released alive before pumping or brailed by lowering a section of the cork-line or by using a dip-net. Because pumping at sea is so common, any non-target catch of small fish would not be sorted at sea but rather observed and sorted when the catch is pumped out of the hold and weighed at the dock. At sea, grates can be used to sort larger non-CPS from the catch. Grates to sort larger non-CPS from the catch are mandatory in Oregon. Since the year 2000, at-sea observers have recorded discard off the states of Oregon, Washington, and California at one time or another. Bycatch is estimated and reported annually in the CPS SAFE.

NMFS Southwest Region implemented a pilot observer program in the Southern subarea of the CPS fishery in July of 2004. The pilot observer program was put in place in order to document the type and amount of incidental catch and bycatch and to validate bycatch rates provided by California Department of Fish and Game (CDFG) dockside sampling. Preliminary catch summary information from the pilot observer program illustrates that non-target catch in the Pacific mackerel fishery is primarily sardine; no observations of ESA listed species have been reported. During the period of 2004-2008, observers recorded a target catch of 40 mt with and incidental, non-target catch of 16 mt of sardine, 5 individual sea cucumbers, and 1 crab.

4.0 Proposed Action and Alternatives

4.1 Proposed Action—Annual Reference Points, Harvest Limits, Targets, and Accountability Measures for 2011/12 Fishing Season

The proposed action is to implement annual harvest limits for the 2011/12 Pacific mackerel fishing season. These include an overfishing limit of 44,336 mt, an ABC of 42,375 mt, an HG of 40,514 mt (which is the result of the HG formula), an ACL of 40,514 (equal to the HG), and an ACT of 30,386 mt.

2011/2012 Pacific Mackerel Annual Specifications	MT
OFL = BIOMASS * F_{MSY} * DISTRIBUTION	44,336
ABC$_{0.40}$ = BIOMASS * BUFFER$_{0.40}$ * F_{MSY} * DISTRIBUTION	42,375
HG = (BIOMASS - CUTOFF) * FRACTION *DISTRIBUTION	40,514
ACL	40,514
ACT	30,386

Harvest Specification and Formula Parameters	Value
BIOMASS (ages 1+, mt)	211,126
Pstar (probability of overfishing)	0.45
SCIENTIFIC UNCERTAINTY BUFFER $_{Pstar}$ (Sigma=0.36)	0.95577[1]
F_{MSY}	0.30
FRACTION	0.30
CUTOFF (mt)	18,200
DISTRIBUTION (U.S.)	0.70

For the 2011/12 management season, the estimated Pacific mackerel biomass of 211,126 mt (age 1+ biomass), an F_{MSY} of 0.30, and an estimated distribution of 70% of the stock in U.S. waters resulted in an OFL (U.S. only) for 2011/12 of 44,336 mt. For use in the ABC calculation, the SSC recommended that 'scientific uncertainty' (σ) be set to the maximum of either: (1) the CV of the biomass estimate for the most recent year; or (2) a default value of 0.36 (roughly, a CV=37% on an arithmetic scale), based on overall stock- and group-specific estimates that provided a reasonable lower -bound proxy for coastal pelagic (and groundfish) species of interest (see PFMC 2010a and Ralston et al. 2011). The CV for the terminal year biomass estimate from the current assessment was equal to 0.21, however the more conservative scientific uncertainty (σ) default value of 0.36 was selected for the 2011/12 season. The ABC buffer depends on the probability of overfishing level determined by the Council (Pstar). For the 2011/12 Pacific mackerel fishery, the Council adopted a Pstar value of 0.45 which resulted in an ABC of 42,375 mt.

The result of the HG formula (HG = (BIOMASS - CUTOFF) * FRACTION *DISTRIBUTION) was 40,514 mt. The Council adopted an ACL equal to the HG (40,514 mt) and set an ACT of 30,386 mt (derived by calculating 75% of the ACL/HG). The difference between the ACT and the ACL/HG is 10,128 mt, which is intended to provide ample incidental set-aside of mackerel for other fisheries if the directed fishery is closed. Should the directed fishery attain the ACT of 30,386 mt, the Council recommended that NMFS close the directed fishery and establish a 45% incidental catch allowance when Pacific mackerel are landed with other CPS, with the exception that up to 1 mt of Pacific mackerel could be landed without landing any other CPS. After the fishery is closed, any incidental harvest of Pacific mackerel shall be applied against the 10,128 mt set-aside for incidental landings.

4.2 No Action—Establish No Reference Points or Harvest Targets

The no action alternative would not establish an OFL, ABC, ACL or harvest guideline for the 2011/12 Pacific mackerel fishing season. This is not considered to be a reasonable alternative because the MSA and the CPS FMP require that these annual harvest limits be determined by according to the framework

[1] The scientific uncertainty buffer that corresponds to a probability of overfishing of 45% and the calculated biomass estimate uncertainty (sigma) of 0.36.

and formulas in the FMP (such as harvest guideline control rule (above in 4.1)).

4.3 Set Higher Reference Points

The following analysis is intended as a qualitative assessment to be used for comparison purposes. The CPS FMP uses specific harvest control rule formulas for specifying harvest levels and does not provide for ranges of harvest levels. Therefore actual numbers or potential harvest levels are not specifically analyzed and were also not considered by the Council.

4.3.1 Set a Harvest Guideline Greater than Specified by the FMP

If a substantive and justifiable reason could be found, setting a harvest guideline greater than that specified by the FMP might be achieved through an emergency rule. However, this is not considered to be a reasonable alternative, as previously determined in the analysis completed for Amendment 8 to the FMP. That analysis concluded the harvest guideline should be determined by a specific harvest control rule (above in 4.1) applied to the current biomass estimate. The management strategy in the CPS FMP for Pacific mackerel is one that is intended to manage Pacific mackerel at catch levels lower, and therefore more conservative, than one needed to ensure that overfishing does not occur. This is the reason for the difference between the OFL level and the commercial fishing harvest quota or HG level for the 2011/12 fishing year. The harvest control rule for Pacific mackerel used to calculate the annual HG includes a variety of OY considerations as well as precautions intended to prevent the stock from becoming overfished and ensuring a minimum spawning biomass is protected. These OY considerations and precautions are based on the dynamic nature of the Pacific mackerel stock as well as its importance in the ecosystem as forage for other species. The outcome of this control rule are catch levels more conservative than would otherwise result using MSY-based management strategies (OFL/ABC), because the focus for CPS is oriented primarily towards biomass versus catch, leaving adequate forage in the ocean and maintaining long-term, consistent catch levels for industry. In using conservative strategies, such as incorporating a CUTOFF value, the mackerel resource is protected at low or uncertain biomass estimates.

4.3.2 Set a higher OFL, ABC, and ACL

Based on the framework in the FMP a higher OFL would require an increase to the F_{MSY} or change to the distribution parameter. Although there is flexibility in the value used for F_{MSY}, based on the best available scientific information, the current value was recommended by the SSC as the best available information for use in management for 2011/12. A change to the distribution factor, however, likely would require an amendment to the FMP or there would need to be demonstration of need under the point-of-concern framework in the FMP. Such changes in the F_{MSY} and distribution also would subsequently increase the ABC, but an increase to the ABC would also result from a less risk adverse choice of Pstar, risk of overfishing. A higher ACL value could be selected; currently the ACL is set equal to the HG. The framework of the FMP stipulates only that the ACL must be lower or equal to the ABC; as such, the ACL value could be increased up to the level of the ABC.

4.4 Set Lower Reference Points

The following analysis is intended as a qualitative assessment to be used for comparison purposes. The CPS FMP uses specific harvest control rule formulas for specifying harvest levels and does not provide for ranges of harvest levels. Therefore actual numbers or potential harvest levels are not specifically analyzed and were also not considered by the Council.

4.4.1 Set a Harvest Guideline Less than Specified by the FMP

Conceivably, setting a harvest guideline lower than that specified by the FMP might be considered for

conservation purposes, if the result of the ABC control rule was lower than the result of the HG formula or if there was uncertainty regarding one of the parameters of the formula that was not considered in the OFL, ABC, or the in this case the ACT.

4.4.2 Set a lower OFL, ABC, and ACL

Based on the framework in the FMP, a lower OFL would result from a decrease to the F_{MSY} value or a change to the distribution parameter. Although there is flexibility in the value used for F_{MSY}, based on the best available scientific information, the current value was recommended by the SSC as the best available information for use in management for 2011/12. A change to the distribution factor, however, likely would require an amendment to the FMP or there would need to be demonstration of need under the point-of-concern framework in the FMP. Additionally, a lower ABC value would result from changes in the F_{MSY} and distribution, but a lower ABC could also result from a less risk adverse choice of Pstar, risk of overfishing. The ACL is currently set equal to the HG; a lower ACL could conceivably be put in place for potential management reasons if it was determined a lower ACL was necessary to prevent the fishery from reaching the ABC value.

5.0 Affected Environment

For the purposes of this action, the general action area is the West Coast EEZ (which is directly affected by the Federal action) and the marine waters, other than internal, of the states of Washington, Oregon, and California (which may be indirectly affected by the federal action).

5.1 Pacific Mackerel Resource

Pacific mackerel occur worldwide in temperate and subtropical coastal waters. In the eastern Pacific, they range from Chile to the Gulf of Alaska, including the Gulf of California. They are common from Monterey Bay, California to Cape San Lucas, Baja California, but are most abundant south of Point Conception, California. Pacific mackerel usually occur within 20 miles of the shore, but they have been taken as far as 250 miles offshore. Adults occur from the surface to 300 meters. Sub-adult and adult Pacific mackerel mature as one-year olds, although most are not sexually mature until age two or three. They become available to the commercial fishery in their first year and are not fully recruited until age four. However, substantial numbers of younger fish are taken by the commercial fishery and make up the bulk of the catch. Recruitment is variable and loosely linked to the size of the spawning biomass. More information on current Pacific mackerel abundance and population trends is available in the current CPS SAFE Report.

A Pacific mackerel stock assessment is conducted annually or biennially in support of the Council process, which makes catch and management recommendations to NMFS for the West Coast Pacific mackerel fishery. Based on the Pacific Mackerel (*Scomber japonicas*) Stock Assessment for USA Management in the 2011-12 Fishing Year, the biomass of Pacific mackerel is 211,126 metric tons (mt). The HG for mackerel applies to a fishing/management season that spans from July 1st and ends on June 30th of the subsequent year (henceforth, presented as a 'fishing year'). The primary purpose of the assessment is to provide an estimate of current abundance (in biomass), which is used in the harvest control rules for calculation of annual reference points.

Pacific mackerel, along with other species such as anchovy, hake, jack mackerel, and Pacific sardine can achieve large populations in the California Current region as well as in other major eastern boundary currents. When Pacific mackerel populations are large, they form an important trophic link between small prey items (zooplankton and smaller fish) and larger avian, mammalian, and piscine predators (Castro Hernández and Santana Ortega, 2000 in McClatchie 2011). Although consumed in significant numbers by a wide variety of predators, Pacific mackerel are likely not as important as forage as Pacific sardine or northern anchovy which are smaller in size (i.e., available to a wider variety of predators) and often more

abundant. Pacific mackerel larvae eat copepods and each other while juvenile and adult Pacific mackerel feed primarily on small fishes, fish larvae, squid, and pelagic crustaceans such as euphausiids. Pacific mackerel larvae are subject to predation from a number of invertebrate and vertebrate planktivores. Juvenile and adults are eaten by larger fishes, marine mammals, and seabirds. Pacific mackerel school, often with other pelagic species, as a defense against predation. Principal predators include porpoises, California sea lions, brown pelicans, striped marlin, black marlin, sailfish, bluefin tuna, white seabass, yellowtail, giant sea bass, and various sharks. Trophic interactions between CPS and higher-trophic-level fish are complex, and it is unknown if populations of individual predaceous fish are enhanced or hindered by large populations of CPS. The value of CPS as forage to adult predators versus the negative effects of CPS predation (on larvae and juveniles of predator fish species) and competition (removal of phytoplankton, zooplankton, and other fish) is unknown.

Modeling efforts are underway that may enhance our understanding of these linkages and improve our ecosystem-based management approaches for these species. However, implementing ecosystem-based management requires an understanding of the complex dynamics of marine ecosystems as well as an understanding of how humans fit into the system. A key step toward ecosystem-based management is to better understand how interactions within food webs affect species of commercial and conservation importance. Efforts are underway to provide comprehensive diet information and food web analysis for major taxa within the California Current ecosystem, including fish, marine mammals, birds, and invertebrates (Dufault et al 2009). Furthermore, robust simulations of the California Current ecosystem that will allow the exploration of potential effects of natural and human-induced perturbations over a range of spatial and temporal scales have been undertaken (Horne et al 2010). Future management tools based on this ongoing work by NOAA will provide a platform for addressing important hypotheses relating to the effects of perturbations (e.g., harvest), characterizing the potential trade-offs of alternate management actions, and testing the utility of ecosystem indicators for long-term monitoring programs. Additionally, these tools will allow consideration of the entire ecosystem such that ecosystem management can maintain multiple ecosystem services as well as system resilience rather than focusing on a single species.

Environmental changes affect all species; however, small coastal pelagic species off the Pacific coast, like those managed by the CPS FMP show responses that offer dramatic examples of environmental effects. In 1983, the biomass (age 1 +) of Pacific sardine was estimated to be 5,145 mt. By 1999, the biomass was estimated to be around 1 million mt (Conser R. J., et al., 2001). Pacific mackerel biomass (age 1 +) estimates were atypically high in the early 1980s but began declining steadily from the mid 1980s to the early 2000s. In recent years, however, population estimates have increased moderately, with some signs of 'rebuilding' observed over the last several years (Crone et al. 2011). However, in historical terms, the population remains at a relatively low abundance level, due primarily to oceanographic conditions. In *El Nino* years, the availability of squid in its typical spawning areas where it is harvested is low, but squid make a dramatic reappearance when the effects of *El Nino* abate.

These types of fluctuations in abundance are common in R-selected species (e.g., pollock, herring, sardine, and mackerel), which generally have higher reproductive rates, are shorter-lived, attain sexual maturity at younger ages, and have faster individual growth rates than K-selected species (e.g., rockfish, many flatfish). As such, predators that utilize R-selected fish species as prey (marine mammals, birds, and other fish) have evolved in an ecosystem in which fluctuations and changes in relative abundances of these species have occurred. Consequently, most of them are generalists who are not dependent on the availability of a single species but rather on a suite of species, any one (or more) of which is likely to be abundant each year.

5.2 Habitat

In 2011 a five-year review of CPS essential fish habitat (EFH) was completed and can be found in the 2011 Stock Assessment and Fishery Evaluation (SAFE) document (PFMC 2011). Although some new information was gathered during this process, no changes were made the actual description of CPS EFH.

A complete description of EFH for CPS may be found in Appendix D of the CPS FMP (PFMC 1998). In determining EFH for CPS, the estuarine and marine habitat necessary to provide sufficient production to support maximum sustainable yield and a healthy ecosystem were considered. Using presence/absence data, EFH is based on a thermal range bordered within the geographic area where a managed species occurs at any life stage, where the species has occurred historically during periods of similar environmental conditions, or where environmental conditions do not preclude colonization by the species. The specific description and identification of EFH for CPS finfish accommodates the fact that the geographic range of all species varies widely over time in response to the temperature of the upper mixed layer of the ocean, particularly in the area north of 39° N latitude. For example, an increase in sea surface temperature since the 1970s has led to a northerly expansion of the Pacific sardine resource.

The specific description and identification of EFH for CPS finfish accommodates the fact that the geographic range of all species varies widely over time in response to the temperature of the upper mixed layer of the ocean, particularly in the area north of 39° N latitude. CPS EFH is linked to ocean temperatures, which shift temporally and spatially, providing a dynamic definition of EFH. This definition is as follows:

> *The east-west geographic boundary of EFH for each individual CPS finfish and market squid is defined to be all marine and estuarine waters from the shoreline along the coasts of California, Oregon, and Washington offshore to the limits of the exclusive economic zone (EEZ) and above the thermocline where sea surface temperatures range between 10^0C to 26^0C. The southern boundary of the geographic range of all CPS finfish is consistently south of the US-Mexico border, indicating a consistency in SSTs below 26^0C, the upper thermal tolerance of CPS finfish. Therefore, the southern extent of EFH for CPS finfish is the US-Mexico maritime boundary. The northern boundary of the range of CPS finfish is more dynamic and variable due to the seasonal cooling of the SST. The northern EFH boundary is, therefore, the position of the 10^0C isotherm which varies both seasonally and annually.*

5.3 Protected Species

A more thorough description of the affected environment for protected species can be found in the Environmental Impact Statement (EIS) prepared for Amendment 8 to the Northern Anchovy FMP, now the CPS FMP (PFMC 1998). Additionally, information can be found in Biological Opinions completed in December 2010 by NMFS Protected Resources Division and in 2006 by the U.S. Fish and Wildlife Service on their respective trust resources and the prosecution of the Pacific sardine fishery. Because the sardine fishery operates similarly to the mackerel fishery, much of the analysis is applicable to the Pacific mackerel fishery.

The harvesting of Pacific mackerel may affect protected species in two ways, direct take of the animals during the prosecution of the fishery (incidental catch) or indirectly due to reductions in prey base (mackerel) that serve as forage. Protected species include species protected by three federal laws, the Endangered Species Act (ESA), the Marine Mammal Protection Act (MMPA), and the Migratory Bird Treaty Act (MBTA).

The following list of endangered or threatened species that may be present in the action area:

Species	**Status**
Marine Mammals	
Blue whale *(Baleaenoptera musculus)*	Endangered
Fin whale *(Baleranoptera physalus)*	Endangered
Humpback whale (*Megaptera novaeangliae*)	Endangered
Sei whale (*Balaenoptera borealis*)	Endangered

Sperm whale (*Physeter macrocephalus*)		Endangered
Killer whales, southern resident DPS (*Orcinus orca*)		Endangered
Northern Right whale (Eubalaena glacialis)		Endangered
Steller sea lion, eastern distinct population segment (DPS) (*Eumetopias jubatus*)		Threatened
Southern sea otter (*Enhydra lutris nereis*)		Threatened
Guadalupe fur seal (Arctocephalus townsendi)		Threatened
Birds		
Short-tailed albatross (*Phoebastria albatrus*)		Endangered
Marbled murrelet *(Brachyramphus marmoratus marmoratus)*		Threatened
Bald eagle *(Haliaeetus leucocephalus)*		Threatened
California least-tern *(Sternum antillarum browni)*		Endangered
Xantus's murrelet *(Synthliboramphus hypoleucus)*		Candidate
Sea turtles		
Leatherback turtle (*Dermochelys coriacea*)		Endangered
North Pacific Loggerhead turtle (*Caretta caretta*)		Endangered
Olive Ridley (*Lepidochelys olivacea*)		Endangered/Threatened
Green Sea Turtle (*Chelonia mydas*)		Endangered/Threatened
Marine invertebrates		
White abalone (*Haliotis sorenseni*)		Endangered
Black abalone (*Haliotis crachereodii*)		Endangered
Fish		
Green Sturgeon, southern DPS (*Acipenser medirostris*)		Threatened
Pacific eulachon, southern DPS*** (Thaleichthys pacificus)		Threatened
Yelloweye Rockfish (Sebastes ruberrimus)		Threatened
Salmonids		
Chinook (*Oncorhynchus tshawytscha*)	Sacramento River winter, evolutionarily significant unit (ESU)	Endangered
	Central Valley Spring ESU	Threatened
	California Coastal ESU	Threatened
	Snake River Fall ESU	Threatened
	Snake River Spring/Summer ESU	Threatened
	Lower Columbia River ESU	Threatened
	Upper Willamette River ESU	Threatened
	Upper Columbia River Spring ESU	Endangered
	Puget Sound ESU	Threatened
Chum (*Oncorhynchus keta*)	Hood Canal Summer Run ESU	Threatened
	Columbia River ESU	Threatened
Coho (*Oncorhynchus kistuch*)	Central California Coastal ESU	Endangered
	S. Oregon/N. CA Coastal ESU	Threatened
	Oregon Coast ESU	Threatened
	Lower Columbia River ESU	Threatened
Sockeye (*Oncorhynchus nerka*)	Snake River ESU	Endangered
	Ozette Lake ESU	Threatened
Steelhead (*Oncorhynchus mykiss*)	Southern California DPS	Endangered
	South-Central California DPS	Threatened
	Central California Coast DPS	Threatened
	California Central Valley DPS	Threatened

	Northern California DPS	Threatened
	Upper Columbia River DPS	Endangered
	Snake River Basin DPS	Threatened
	Lower Columbia River DPS	Threatened
	Upper Willamette River DPS	Threatened

Critical Habitat		
Stellar sea lion (*Eumetopias jubatus*)	Rogue Reef: Pyramid Rock Oxnard Reef: Long Brown Rock and Seal Rock Ano Nuevo I. Southeast Farrallon I. Sugarloaf I.	Associated aquatic zones 3,000 feet seaward in State and Federally managed waters from the baseline of each rookery
Green Sturgeon, southern DPS (*Acipenser medirostris*)	US coastal marine waters within 60 fathoms from Monterey Bay, CA, to Cape Flattery, WA, the Sacramento River and other select waters within the Sacramento-San Joaquin River-Delta system, and other select coastal bays and estuaries waters within California, Oregon, and Washington.	
Letherback sea turtle (Dermochelys coriacea)	Includes approximately 16,910 square miles (43,798 square km) stretching along the California coast from Point Arena to Point Arguello east of the 3,000 meter depth contour; and 25,004 square miles (64,760 square km) stretching from Cape Flattery, Washington to Cape Blanco, Oregon east of the 2,000 meter depth contour. The designated areas comprise approximately 41,914 square miles (108,558 square km) of marine habitat	Critical habitat extends to a water depth of 80 meters from the ocean surface and is delineated along the shoreline at the line of extreme low water, except in the case of estuaries and bays where COLREGS lines (defined at 33 CFR part 80) shall be used as the shoreward boundary of critical habitat.

A number of non-ESA listed marine mammals may also occur in the affected area, these include: northern fur seal, California sea lion, harbor seal, northern elephant seal, bottlenose dolphin, Pacific white-sided dolphin, common dolphin, harbor porpoise, Dall's porpoise, and minke whale. These species, like all marine mammals, are protected under the MMPA. Section 118 of the MMPA requires NMFS to place all U.S. commercial fisheries into one of three categories (I, II, III) based on the level of incidental serious injury and mortality of marine mammals occurring in each fishery (16 U.S.C. 1387(c)(1)), with Category I being the highest level of interactions and III being the lowest level. This is known as the List of Fisheries (LOF). Under the most recent LOF, the California, Oregon and Washington mackerel fisheries are listed as Category III fisheries, meaning that these fisheries have a remote likelihood of/no known incidental mortality or serious injury of marine mammal.

At-sea observers have witnessed interactions with California sea lions, Pacific white-sided dolphins, and gulls within the California portion of the fishery. Observer records indicate that marine mammals, marine turtles, and steelhead are not encountered in the Pacific mackerel purse seine fishery in Oregon and Washington. Fishermen in the southern subarea have not recorded bycatch of marine turtles, southern green sturgeon, or steelhead in the sardine purse seine fishery. This is supported by observer information from vessels operating from San Pedro, Moss Landing, Dana Point, and San Diego,

California.

Critical habitat for ESA listed cetaceans and most sea turtles has not been designated or proposed within the action area. Critical habitat for listed salmonids does not include marine waters and therefore it is not within the action area. Critical habitat for Steller sea lions in California are the rookeries at Ano Nuevo Island, Sugarloaf Island, and the southeast Farrallon Islands (50 CFR 226.202). Pacific mackerel fishermen in California do not fish near these islands, therefore the proposed action is not expected to affect critical habitat for Steller sea lions.

5.4 Fishing Industry

Historically, two independent fleets fished for Pacific mackerel: the purse seine fleet, which was nearly identical with the sardine fleet, and the scoop fleet which was a mixture of specialized mackerel fishermen and off-season albacore fishermen. After the shortage of fish in the early 1950's, the scoop fleet fell from 348 full-time boats (6 or more days fished in the peak month) in 1949 to 10 full-time boats in 1952. As the fishing technique was highly specialized for this one species, the scoop fleet never fully recovered, and it finally disappeared in the mid 1960's. The purse seiners, which were able to switch to other species and were interested in Pacific mackerel as an alternative to the more lucrative sardine, survived the shortages of mackerel and sardines and continued fishing the species until a moratorium was imposed in 1970 (Parrish and McCall 1978).

Along the West Coast, additional vessels target CPS finfish in small quantities, typically selling their catch to specialty markets for relatively high prices. In recent years, these have included:

- Approximately 18 live bait vessels in southern California and two vessels in Oregon and Washington that landed about 4,000 mt per year of CPS finfish (mostly northern anchovy and Pacific sardine) for sale to recreational anglers.
- Roundhaul vessels that take a maximum of 1,000 mt to 3,000 mt per year of northern anchovy that are sold as dead bait to recreational anglers.
- Roundhaul and other mostly small vessels that target CPS finfish (particularly Pacific mackerel and Pacific sardine) for sale in local fresh fish markets or canneries.
- In Washington, albacore tuna vessels using lampara gear that target northern anchovy for use as live bait in the tuna fishery.

The CPS fishery is administratively divided into a federally managed “limited entry” fishery (requiring Federal permits in order to participate in the fishery), south of 39 degrees North latitude (Southern subarea), and an “open access fishery” (not requiring Federal permits to participate in the fishery), north of 39 degrees North latitude (northern subarea). Vessels landing less than five metric tons of CPS per trip in the Southern subarea are exempt from limited entry requirements. The CPS LE fleet currently consists of 65 permits and 58 vessels. The LE vessels range in age from 4 to 68 years, with an average age of 33 years. Average vessel age has decreased by approximately two years since the initial fleet was established. The capacity goal and transferability provisions established under Amendment 10 are based on calculated gross tonnage (GT) of individual vessels. Calculated GT serves as a proxy for each vessel’s physical capacity and is used to track total fleet capacity. The fleet capacity goal established through Amendment 10 is 5,650.9 GT, and the trigger for restricting transferability is 5,933.5 GT (Goal + 5 percent). The 20011 LE fleet was 5,238 GT, well within the bounds of the capacity goal and not likely substantially different from current capacity. The gear type traditionally used in the CPS fishery is a purse seine. Typical purse seine nets measure 185 fathoms long, 22 fathoms wide and 1,600 meshes deep with 1 ¼ inch mesh (Lutz and Pendleton, 2000).

In 2010, 2,056 t of Pacific mackerel were landed in California. The majority of landings were made in southern California port areas. Oregon reported 49 t of Pacific mackerel landed; this is slightly less than the 2009 catch of 53 t. No landings of mackerel have been reported in Washington since 2005, and Washington landings of Pacific mackerel are typically low. The 2010 recreational Pacific mackerel catch

as sampled from California Recreational Fisheries Survey (CRFS) was 233 t (1,168,000 fish), a 97% (77%, by number of fish) increase from 2009. A total of 27,205 fish were reported landed on CPFVs.

There is no directed fishery for mackerel in Oregon or Washington. Small amounts are taken incidentally by commercial jig boats and trawlers. Incidental take (reported landings) of Pacific (chub) and jack mackerel peaked in 1997, with 1,984 mt landed in Oregon and 157 mt landed in Washington. Annual incidental take of Pacific mackerel in the sardine fishery in Oregon from the last ten years has remained below 700 mt, while in Washington it has remained below 300 mt.

A description of the affected socioeconomic environment and further economic analysis of this action can be found in Section 7.

6.0 Environmental Consequences

6.1 Proposed Action– Annual Reference Points, Harvest Limits and Targets for 2011/12 Fishing Season

The proposed action is to implement the recommended annual harvest limits for the 2011/12 Pacific mackerel fishing season. These include an overfishing limit of 44,336 mt, an ABC of 42,375 mt, an ACL/HG of 40,514 mt (equal to the ABC), and an ACT of 30,386 mt for the 2011/12 Pacific mackerel fishing year. The ACT of 30,386 mt is the primary directed fishing management target for the fishery. Once this catch level has been reached the directed fishery is closed, reserving the difference between the ACL and ACT (10,128 mt) as a set aside for incidental landings in other CPS fisheries and other sources of mortality. For the remainder of the fishing year, incidental harvest measures would apply: other CPS fisheries harvest may include up to 45% Pacific mackerel by weight, a directed harvest of Pacific mackerel up to 1 mt would be allowed. Upon attainment of the ACL (40,514 mt), no retention of Pacific mackerel would be allowed in CPS fisheries. Although the ACT is the directed fishing target for the fishery, the analysis of impacts to the environment the focus will be on the HG/ACL catch level which is the maximum catch level for CPS fishing for mackerel.

6.1.1 Pacific Mackerel Resource

6.1.1.1 Direct and Indirect Impacts

The primary impact to the Pacific mackerel resource as a result of this action is the potential removal of approximately 40,514 mt of Pacific mackerel, as this catch level is the primary management target for the fishery. Once this catch level has been reached the fishery is closed and no retention of Pacific mackerel is allowed in CPS fisheries. Bycatch and incidental catch of Pacific mackerel in non-CPS fisheries is *de minimus*, as is any sort of research catch.

The current harvest control rule formula used to determine the HG for Pacific mackerel takes into account the mackerel resource as well as ecosystem and physical environmental factors. This is accomplished through a low harvest fraction (30%), an 18,200 mt threshold below which fishing is prohibited, and recognition that mackerel are caught internationally. These precautions are based on the dynamic nature of the Pacific mackerel stock as well as its importance in the ecosystem as forage for other species.

The current harvest control rule formula also incorporates an 18,200 mt stock biomass threshold, or "cutoff" below which no harvest is allowed. Each year this "cutoff" number of 18,200 mt is subtracted from the overall biomass number before the harvestable biomass is calculated to ensure a minimum spawning biomass is protected. In so doing, the mackerel resource is protected at low or uncertain biomass estimates.

To further minimize any direct significant adverse impacts on the mackerel resource the formula includes

a DISTRIBUTION parameter in recognition of the transboundary nature of the mackerel stock. In the absence of a cooperative international management agreement, the current approach in the CPS FMP sets harvest levels for U.S. fisheries by prorating the total target harvest level according to the portion of the stock estimated to be in U.S. waters, on average over the long-term. The primary advantage of prorating the total target harvest level is that U.S. fisheries can be managed unilaterally in a responsible manner.

Additionally, stock assessment biologists from NMFS Southwest Fisheries Science Center (SWFSC) in La Jolla, California, have recently been working with scientists from Mexico to obtain better landings estimates from the Mexican mackerel fishery.

6.1.1.2 Cumulative Impacts

The proposed action is not likely to result in cumulative impacts to mackerel when added to other past, present, and reasonably foreseeable future actions. The primary past, present and foreseeable actions that may impact Pacific mackerel stocks are those associated with the directed commercial harvest of Pacific mackerel. There are no state or Federal fisheries for which a significant amount of Pacific mackerel is caught as bycatch and research catch of this species is *de minimus* (less than 1 mt). Pacific mackerel schools with other similarly-sized CPS (particularly jack mackerel and Pacific sardine, and likely based on age-dependent attributes as well), and, historically, this led to incidental catch of this species that influenced stocks. However, current bycatch and incidental landings are a fraction of the overall landings (and much of the non-target catch of Pacific makerel reported by observers was alive and returned); furthermore, incidental, non-target catch in other CPS fisheries and other sources of mortality are explicitly addressed in Pacific mackerel management through the buffer between the ACL and ACT (10,128 mt).

The proposed action maintains the harvest strategy established in the FMP, which provides benefits to society while maintaining a renewable resource. The choice of this particular management strategy is described in Section 4.3 of the FMP (Amendment 8 [PFMC, 1998]) and Section 3 of this document. The strategy, which incorporates annual or bi-annual estimates of biomass, utilizes, among other considerations, a biomass cutoff level to protect a viable spawning stock in low biomass years. Furthermore, the strategy accounts for fishable biomass in Mexican waters by using the percent of the resource in U.S. waters and the inherent uncertainty in estimating biomass.

The annual harvest guideline is directly tied to current estimates of biomass. Two circumstances can lead to biomass projections that would exceed reality, allowing for potentially excess harvest. One is the model overestimating abundance. To reduce the chance of this happening, data for the most recent year and any new biological information that might have been obtained are compared to all past biomass estimates. The biomass estimate provides a new picture of the fluctuation of the resource over time. The other circumstance that can confound management is harvest in Mexico that exceeds levels accounted for in the formula, which could potentially lead to overfishing of the resource on a stock level. Landing information obtained from Mexico, and landings from all areas for the previous year, are incorporated into the model so that all harvested fish are accounted for. If actual harvests exceed planned harvests in any year, this could lead to a lower biomass estimate the following year, which, in turn, would lead to a lower harvest guideline than would otherwise be possible. This is a short-term risk that can be remedied in the following years' biomass projections and harvest limits. Further, stock assessment biologists from NMFS Southwest Fisheries Science Center (SWFSC) in La Jolla, California, have recently been working with scientists from Mexico to obtain better landings estimates from the Mexican mackerel fishery and are collaborating with scientists from both countries to develop more robust estimates of mackerel abundance.

Additionally, there is an approximately 1,861 mt difference between the ABC level and the ACL/HG. This is the result of the management strategy for Pacific mackerel, like all CPS, that manages at catch levels

more conservative than the one needed to solely insure that overfishing does not occur. The harvest control rule for Pacific mackerel that calculates the HG includes a variety of OY considerations as well as precautions intended to prevent the stock from becoming overfished (reduced harvest fraction and threshold below which fishing is prohibited). These OY considerations and precautions are based on the dynamic nature of the Pacific mackerel stock as well as its importance in the ecosystem as forage for other species. The outcome of this control rule is catch levels more conservative than otherwise MSY-based management strategies (OFL/ABC), because the focus for CPS is oriented primarily towards biomass versus catch, leaving adequate forage in the ocean and maintaining long-term, consistent catch levels for industry.

Further, the 10,128 mt difference between the ACL/HG and the ACT catch level for the 2011/12 fishing year is another AM that further protects the stock from overfishing.

No significant adverse cumulative impacts to the Pacific mackerel are expected.

6.1.2 Habitat

6.1.2.1 Direct and Indirect Impacts

The area affected by the proposed action in the CPS fishery has been identified as EFH by Amendment 8 to the FMP (December 15, 1999; 64FR69888). The establishment of the HG and the associated fishing activities involved may affect EFH through the removal of a prey source. However, this is not expected to be a significant change from current conditions and would not result in a significant adverse impact. The CPS fishery uses lampara and purse seine gear which are generally not associated with adverse impacts to ocean and coastal habitats. The fishery is also prosecuted in pelagic habitats, which, because of their physical characteristics, are not significantly affected by this fishing gear.

6.1.2.2 Cumulative Impacts

The proposed action is not likely to result in cumulative impacts to EFH when added to other past, present, and reasonably foreseeable future actions. An EFH consultation was requested with the Habitat Conservation Division, Southwest Region, on the impacts of the HG on EFH. The area affected by the proposed action in the CPS fishery has been identified as EFH by Amendment 8 to the FMP (December 15, 1999; 64 FR 69888). The establishment of the HG and the associated fishing activities involved are not likely to have a significant adverse effect on EFH. The CPS fishery uses lampara and purse seine gear which are generally not associated with adverse physical impacts to pelagic habitats. In addition, the HG leaves a substantial amount of Pacific mackerel for ecosystem needs (i.e., forage). Because the potential adverse impact on biological EFH is not substantial, NMFS conducted an abbreviated EFH consultation pursuant to 50 CFR 600.920(h) and prepared an EFH Assessment that incorporates all of the information required in 50 CFR 600.920(e)(3).

In all previous consultations it was determined that Pacific mackerel fishing would not have a significant adverse effect on EFH. The Habitat Conservation Division (HCD) determined although the removal of Pacific mackerel may affect EFH through the removal of a prey source, the HG adequately minimizes the adverse effect by ensuring that sufficient numbers of Pacific mackerel remain in the ecosystem, thus adhering to the intent of the EFH provisions of the Magnuson-Stevens Act which is to promote the protection, conservation, and enhancement of EFH for the purpose of maintaining sustainable fisheries. HCD determined that the anticipated adverse effects are so minimal in nature that no EFH conservation recommendations are necessary to avoid, minimize, mitigate, or otherwise offset the adverse effects to EFH.

6.1.3 Protected Resources

6.1.3.1 Direct and Indirect Impacts

To date, there is no evidence to suggest that ESA listed sea turtle, marine mammal, and salmonid species are being incidentally taken in the mackerel fishery as it is currently and proposed to be prosecuted. Fishing for Pacific mackerel is rare in northern California. Bycatch of salmon has not been observed in southern California fishery. The State of California conducts portside catch sampling at San Pedro, CA and Monterey, CA, the two major ports for mackerel landings. The mackerel landings are sampled approximately 12 days per month and, thus far, salmon have not been observed (PFMC 2011). No salmon have been observed in the pilot observer program that has been in place on the southern subarea since July 2004 (NMFS 2005a).The other possible effect of fishing under the proposed harvest guideline is a decline in forage for ESA listed species. Sei whales and Steller sea lions have varied diets that include mackerel as a major component (PFMC 1998). Fishing under the proposed mackerel harvest guideline is not likely to result in a decline in forage available to ESA listed species. The proposed harvest guideline includes a substantial amount of unharvested biomass left in the marine environment. The formula used to calculate the annual harvest guideline is conservative and includes a reserve of biomass that is not available for consideration for harvest as well as a relatively low harvest fraction of 30%. If the ACT were reached during the 2011/12 fishing season, 14% of the estimated biomass would be harvested. At current harvest levels (based on total harvest in 2010), less than 1% of the estimated Pacific mackerel biomass is removed by the fishery. Based upon the available information, it is unlikely that ESA listed species are being incidentally taken in the mackerel purse seine fishery or affected by a loss of prey.

Critical habitat for listed salmonids does not include marine waters and, therefore, it is not within the action area. Critical habitat for Steller sea lions in California are the rookeries at Ano Nuevo Island, Sugarloaf Island, and the southeast Farrallon Islands (50 CFR 226.202). All of these are in central California, north of the areas usually fished for mackerel. There is occasional take of mackerel in the CPS fishery near Monterey, CA. However landings records indicate that the majority of the mackerel fishing occurs within 20 miles of San Pedro, in southern California. The very low level of directed mackerel fishing effort in Central California makes impacts to critical habitat very unlikely.

The last informal consultation specific to Pacific mackerel to implement the 2007-2008 Pacific mackerel harvest guideline. The informal consultation was completed by PRD, in August 2006, and concurred with SFD that fishing under the 2007-2008 harvest guideline was not likely to adversely affect endangered or threatened species or critical habitat. Therefore, NMFS believes that the mackerel fishery off the coast of California is not likely to adversely affect salmonid or any other protected species.

6.1.3.2 Cumulative Impacts

The proposed action is not likely to result in cumulative impacts to protected species when added to other past, present, and reasonably foreseeable future actions.

To date, there have been nine consultations on the effects of CPS fisheries on endangered and threatened species. Most recently, NMFS SWR Sustainable Fisheries Division initiated a formal section 7 consultation with NMFS SWR Protected Resources Division (PRD) on the operation and prosecution of the Pacific sardine fishery. PRD completed a formal section 7 consultation on this action and, in a Biological Opinion dated December 21, 2010, determined that sardine fishing activities conducted under the CPS FMP and its implementing regulations are not likely to jeopardize the continued existence of any endangered or threatened species under the jurisdiction of NMFS or result in the destruction or adverse modification of critical habitat of any such species. Because the Pacific sardine fishery is operationally similar to the Pacific mackerel fishery and occurs in similar area, except far more restricted (Pacific mackerel fishing primarily only occurs southern and central California), these conclusions are generalizable to the Pacific mackerel fishery.

NMFS also initiated an ESA section 7 consultation with U.S. Fish and Wildlife Service (USFWS) regarding the effects of sardine fishing under the CPS FMP, as amended by Amendment 11 to the CPS FMP.

USFWS concurred with NMFS and determined that sardine fishing under the CPS FMP as amended by Amendment 11 may affect, but was not likely to adversely affect: the endangered tidewater goby, the threatened western snowy plover, the Santa Ana sucker, the endangered short tailed albatross, the endangered California brown pelican, the endangered California least-tern, the threatened marbled murrelet, the threatened bald eagle, the threatened bull trout, and the candidate Xantus's murrelet. Formal consultation, however, was deemed necessary on the possible effects to the southern sea otter. The resulting biological opinion (BO) signed June 16, 2006, concluded that fishing activities conducted under Amendment 11 and its implementing regulations were not likely to jeopardize the continued existence of the otter. As a result of this BO, new reporting requirements and conservation measures were implemented in for all CPS fisheries to provide further protection for southern sea otters. Specifically, CPS fishing boat operators and crew are prohibited from deploying their nets if a southern sea otter is observed within the area that would be encircled by the purse seine and must report if any interaction does take place with a sea otter. This management regime continues unchanged under the current CPS FMP, as amended through Amendment 13, and, therefore, the 2006 BO issued by USFWS remains valid and effective. And as previously mentioned, because the Pacific sardine fishery is operationally similar to the Pacific mackerel fishery and occurs in similar area, except far more restricted (Pacific mackerel fishing primarily only occurs southern and central California), these conclusions are generalizable to the Pacific mackerel fishery.

6.1.4 Fishing Industry

6.1.4.1 Direct and Indirect Impacts

Determining the annual HG, ACL, and associated buffer values merely implements the established procedure and continues to provide expected net benefits to the nation, regardless of what the specific annual allowable harvest of Pacific mackerel is determined to be, which is inextricably linked to environmental factors influencing the resource. Additionally, incidental set-aside provisions allow access to other important CPS fisheries that many CPS fishermen also utilize and were recommended to the Council by the CPS Advisory Subpanel, which is an industry advisory group to the Pacific Council. A more detailed analysis of the economic impact of this action can be found in Section 7.

6.1.4.2 Cumulative Impact

An analysis of the economic impact of this action can be found in Section 7.

6.2 No Action—Establish No Harvest Guideline

6.2.1 Direct and Indirect Impacts

6.2.1.1 Pacific Mackerel Resource

The Pacific sardine fishing season begins on January 1 even if an OFL, ABC, ACL or a harvest guideline are not established. Implementing the no action alternative would eliminate the allocation procedures in the FMP. This would allow vessels to harvest coastwide without the restrictions explicit in the OFL, ABC, ACL and harvest guideline, such as incidental set-asides. A fishery unregulated by these measures could result in overfishing of Pacific sardine as fishing effort could increase. This would not pose a biologically irreversible situation for the sardine resource however, as these are only annual harvest levels, and potential uncapped harvest in a single year is unlikely to affect the stock; however there would be some risk of exceeding levels that are associated with attaining OY. Additionally, if catch did appear to be exceeding a level that appeared to pose some sort of short term risk, NMFS could close the fishery through emergency action.

6.2.1.2 Habitat

Unrestricted harvest may also have an impact on the affected habitat through the removal of a prey source, however this is unlikely given the low harvest rates of Pacific mackerel in the West Coast EEZ.

6.2.1.3 Protected Resources

Unrestricted harvest may have an impact on protected resources through the removal of a prey source, however this is unlikely given the low harvest rates of Pacific mackerel in the West Coast EEZ.

6.2.1.4 Fishing Industry

Implementing the no action alternative could potentially provide short term economic benefits to industry due to increased revenues, however this is unlikely given that harvest of Pacific mackerel in past seasons has not approached levels specified in harvest guidelines.

6.2.2 Cumulative impacts

6.2.2.1 Pacific Mackerel Resource

The no action alternative could present an increased risk to overharvesting the Pacific mackerel resource, and overharvesting could negatively impact on the Pacific mackerel resource in future years. One of the intents of the FMP harvest formula is to protect enough Pacific mackerel to allow them to maintain their biomass. Landings are included in the model determining the following years' biomass; therefore, under the no action alternative, the following years' biomass may be less than would be realized by adhering to the harvest formula in the FMP. In summary, not having a harvest guideline for the current fishing season could pose a future negative biological impact on the resource but likely only if it continued over the long term.

6.2.2.2 Habitat

Because one of the intents of the FMP harvest formula is to allow Pacific mackerel to provide enough prey for species that utilize this resource, providing forage for predatory species is built into the harvest formula. Therefore exceeding the HG could have a habitat effect on those species dependent on mackerel, but this effect would be unlikely to be long term because a buffer is built into the harvest formula; a higher harvest than specified by the FMP could be realized without a short-term detrimental effect on the resource. However, this only speaks to a large harvest this year and does not address extending such a practice in subsequent years when the biomass may be declining, which would affect recruitment.

6.2.2.3 Protected Resources

The no action alternative could present an increased risk to protected resources. Multiple years of unregulated fishing of Pacific mackerel could reduce biomass to such an extent that predators might be influenced. Studies of predator-prey interactions suggest there is a threshold in prey abundance below which seabirds experience reduced or more variable reproduction (Cury et al 2011). While current HG levels are well below this threshold, sustained overfishing of Pacific mackerel could drive biomass below the level necessary to maintain seabird productivity over the long term. Not having a harvest guideline for the current fishing season could pose a future negative biological impact on listed species, however Pacific mackerel are likely not as important as forage as Pacific sardine or northern anchovy which are smaller in size (i.e., available to a wider variety of predators) and often more abundant.

6.2.2.4 Fishing Industry

The lack of a harvest guideline for the current fishing season could provide a positive economic impact to

fishermen in the short term if conditions change such that there is a higher demand for Pacific mackerel and catch levels increase, however the HG formula is intended to ensure long-term optimum yield of mackerel, and, therefore, long-term opportunities for relatively stable levels of harvest as opposed to a "boom-and-bust" type fishery.

6.3 Setting a Harvest Guideline Greater than Specified by the FMP

6.3.1 Direct and Indirect Impacts

The impacts of this alternative would be similar to the no action alternative (6.2.1.1-6.2.1.4). There would be the potential for an increased risk to ESA listed species, habitat, the Pacific mackerel stock itself, and future fishing availability. Setting a harvest level greater than the proposed guideline may produce short term economic benefits to fishermen.

6.3.2 Cumulative impacts

6.3.2.1 Pacific Mackerel Resource

Setting an HG greater than specified by the FMP faces two difficulties: (1) the potential for a decline of the resource with increased harvest, and (2) the increased likelihood of negative biological impacts if juvenile estimates are uncertain. The higher the harvest is above that intended by the FMP, the greater the potential for exacerbating a decline of the resource that could already be occurring. The potential for negative biological impacts also is high if the uncertainty of the estimate of mackerel less than age 1 is high. Given that natural mortality is high, how much biomass the zero age class will contribute to the biomass of the resource falls more in the area of speculation than science, even when biomass estimates are high. Increased levels of uncertainty increase the likelihood of negative biological impacts.

6.3.2.2 Habitat

The proposed harvest guideline is at a level that allows use of the Pacific mackerel resource yet takes the affected environment into account (by use of "the cutoff" and "the harvest fraction"); setting an HG greater than specified by the FMP could detrimentally affect habitat by reducing the forage available to predators.

6.3.2.3 Protected Resources

A harvest guideline specified by the FMP avoids a significant cumulative effect to the affected environment. It is possible that setting an HG greater than specified by the FMP could adversely affect protected resources by reducing forage.

6.3.2.4 Fishing Industry

It is possible some economic benefits of increased revenue would accrue to the fishing industry by allowing a harvest greater than that permitted by the formula in the FMP. However, recent landings have been well below the harvest guidelines (2,105 mt of a harvest guideline of 8,000 mt in 2009 - 2010) and the U.S. fishery appears to be limited by markets and resource availability to about 40,000 mt per year. Industry is expected to benefit in the long-run by management under the conservative HG control rule of the CPS FMP.

6.4 Setting a Harvest Guideline Less than that Specified by the FMP

6.4.1 Direct and Indirect Impacts

6.4.1.1 Pacific Mackerel Resource

Setting a lower harvest guideline may have a positive impact on the mackerel resource. However protection to maintain the sustainability of the mackerel resource already is built into the harvest formula.

6.4.1.2 Habitat

A reduced harvest guideline may have a positive effect on habitat, but this effect would not have significantly beneficial impacts to the marine habitat in terms of increased prey availability or forage base as a forage buffer is already built into the harvest formula.

6.4.1.3 Protected Resources

Although this alternative may decrease the risk of protected species interactions, current fishing levels have been shown unlikely to jeopardize the continued existence of any endangered or threatened species.

6.4.1.4 Fishing Industry

Setting a harvest guideline less than what is specified by the harvest formula in the FMP could potentially have a direct negative impact on the fishing industry due to decreased revenues, however given the low catch levels, this is unlikely.

6.4.2 Cumulative impacts

6.4.2.1 Pacific Mackerel Resource

Reducing the harvest of Pacific mackerel by setting a harvest guideline lower than the proposed harvest guideline may have an overall positive effect on the Pacific mackerel resource. However, the benefit would be limited to situations such as catastrophic environmental events (e.g., a strong El Nino) and management failure.

6.4.2.2 Habitat

Setting a harvest guideline less than the proposed harvest guideline may have an overall positive effect on marine habitat and the ecosystem, but only in terms of the potential to function as insurance from catastrophic environmental events (e.g., a strong El Nino) and management failure.

6.4.2.3 Protected Resources

Setting a lower HG is unlikely to significantly change the cumulative impacts to protected resources given that the Pacfic mackerel fishery does not directly interact with protected species. However, a lower HG may increase forage for protected species, but this is unlikely given the low harvest rates of Pacific mackerel in the West Coast EEZ.

6.4.2.4 Fishing Industry

Setting a lower HG likely would have a negative economic impact on fishermen. The cumulative impact of reducing the potential profit achieved be the fishery is difficult to determine because it is dependent upon how much mackerel the fleet ultimately catches in this fishing season as well as any profit from other fisheries in which they may participate.

6.5 Climate Change

Climate change is defined as any significant change in climate metrics, including temperature, precipitation, and wind patterns, over a period of time (U.S. EPA Glossary of Climate Change Terms, http://www.epa.gov/climatechange/glossary.html#C). The effects of climate change most people refer to today stems from "global warming," a relatively recent phenomenon of rising average temperatures across the globe. The temperature increase is thought to be due in large part to the human-induced increase in greenhouses gas emissions released into the atmosphere as a result of combustion. Common greenhouse gases (GHG) such as carbon dioxide, methane, and nitrous oxide trap radiant heat from the earth causing the average temperature to rise.

The alternatives presented here would not be expected to affect climate change. The purpose of the proposed action is to set harvest levels for the Pacific mackerel fishery. This action will not affect fishing fleet dynamics (i.e., number of vessels, amount of time spent fishing) from this action.

As mentioned in previous sections, fluctuating oceanographic conditions are known to have significant effects on the abundance of CPS in the Pacific Ocean and worldwide. The El Niño/Southern Oscillation (ENSO) and the Pacific Decadal Oscillation (PDO) are known to cause significant fluctuations at annual and longer time scales, altering primary and secondary production in the California Current and influencing CPS abundances. Many CPS and other fishes show significant alterations in their coastal distributions during strong El Niño or warm ocean periods (Phillips et al. 2007), and sardines appear to become abundant during warm PDO periods and anchovy during cool PDO periods. Ocean temperatures, which are known to have direct effects on CPS recruitment, distribution, and abundance, have increased worldwide (Domingues et al. 2008); climate change is expected to alter frequencies and duration of oscillations, but the levels are still impossible to predict.

Other impacts of climate change include effects on upwelling and ocean pH. Upwelling is responsible for bringing nutrient rich waters from depth to the surface, thus enhancing primary production. Future climate change scenarios indicate much uncertainty as to whether winds and ocean conditions will be more conducive to upwelling or not. There is also concern that the phenology (i.e., timing of upwelling relative to the evolved life histories of various species) might be affected by alterations or changes in the seasonality and timing of upwelling periods along the west coast (Bograd et al. 2008). Furthermore, increased concentrations of carbon dioxide dissolving into the oceans and leading to decreased pH, or ocean acidification, will have significant consequences on calcifying prey organisms that sardines and other CPS rely on (Feely et al. 2004; 2008; Kerr 2010).

However, because it is known that mackerel populations can fluctuate both over the short and long-term in response to the environment, the harvest control rule and harvest setting process is intended to be robust to these changes by assessing the stock bi-annually and maintaining a minimum level of spawning biomass. Therefore there will not be negative cumulative impacts from this action when considered with potential impacts of climate change.

7.0 Economic Consequences

The Pacific mackerel HG/ACL is 40,514 mt, and the ACT is 30,386 mt. Upon attainment of the ACT, the directed fishery would be closed, reserving the difference between the HG/ACL and the ACT (10,128 mt) as a set aside for incidental landings in other CPS fisheries and other sources of mortality. If the HG/ACL is reached at any time, no retention of Pacific mackerel would be allowed in CPS fisheries and the Pacific mackerel fishery would be closed until the next fishing season begins. There is no limit on the amount of catch that any single vessel can take during the year; the HG/ACL is available until fully utilized by the entire CPS fleet. As the primary management target for the directed fishery, the ACT provides ample directed harvest (well beyond harvest in recent years) while still providing access to other CPS fisheries, such as squid and sardine where incidental catch of Pacific mackerel occurs, if the ACT is reached.

The small entities that would be affected by the proposed action are the vessels that compose the West

Coast CPS finfish fleet. Pacific mackerel are principally caught off southern California within the limited entry portion (south of 39 degrees N. latitude; Point Arena, California) of the fishery. Sixty-four vessels are currently permitted in the Federal CPS limited entry fishery off California. .This proposed rule has an equal effect on all of these small entities and therefore will impact a substantial number of these small entities in the same manner. These vessels are considered small business entities by the U.S. Small Business Administration since the vessels do not have annual receipts in excess of $4.0 million. Therefore, there would be no economic impacts resulting from disproportionality between small and large business entities under the proposed action.

The profitability of these vessels as a result of this proposed rule is based on the average Pacific mackerel ex-vessel price per mt. NMFS used average Pacific mackerel ex-vessel price per mt to conduct a profitability analysis because cost data for the harvesting operations of CPS finfish vessels was unavailable.

For the 2010 fishing year the HG was set at 8,000 mt. Approximately 2,105 mt (2,053 mt in California, 49 mt in Oregon, and 2 mt in Washington) of this HG was harvested during the 2010 fishing season with an estimated ex-vessel value of $414,256. The 2010 HG (8,000 mt) was only 20% that of 2009 (40,000 mt), however landings in 2010 were less than half of those in 2009 (2,105 mt in 2010 versus 5,132 mt in 2009). Ex-vessel price per pound was similar across these years such that ex-vessel revenue for 2010 was less than half that of 2009 ($1,101,634). Though landings were lower in 2010, the large difference in HGs from 2009 and 2010 was not reflected in landings and ex-vessel revenue.

7.1 Proposed Action–Harvest Guideline for 2012 Based on FMP Harvest Formula and ACT

The proposed ACT for the 2011/12 Pacific mackerel fishing season (July 1, 2011 through June 30, 2012) is 30,386 metric tons (mt). Comparing the directed fishing level/target for 2011/12 to that of the previous year, this is nearly 4X higher than the HG for 2010. If the fleet were to take the entire 2011/12 ACT, and assuming a coastwide average ex-vessel price per mt of $206 (average of 2009 and 2010 ex-vessel), the potential revenue to the fleet would be approximately $6.3 million. Whether this will occur depends greatly on market forces within the fishery and on the regional availability of the resource to the fleets and the fleets' ability to find pure schools of Pacific mackerel. A change in the market and/or the potential lack of availability of the resource to the fleets could cause a reduction in the amount of Pacific mackerel that is harvested, in turn, reducing the total revenue to the fleet from Pacific mackerel. The U.S. fishery appears to be limited by markets and resource availability to about 40,000 mt per year and landings have rarely exceeded 20,000 mt over the last 20 years and averaged approximately 6,000 mt without exceeding 10,000 mt over the last 10 years. As a result, it is unlikely landings will reach the HG and the ex-vessel revenue associated with this upper threshold.

However, the revenue derived from harvesting Pacific mackerel is only one factor determining the overall revenue of a majority of the CPS fleet and, therefore, the economic impact to the fleet from the proposed action cannot be viewed in isolation. CPS finfish vessels typically harvest a number of other species, including Pacific sardine, anchovy, jack mackerel, and squid, making Pacific mackerel only one component of a multi-species CPS fishery. A reliance on multiple species is a necessity because each CPS stock is highly associated to ocean and environmental conditions and because each stock responds to such conditions in its own way. For instance, even yellowfin and bluefin tuna are harvested if these species show up within range of the fishing fleet. Not all CPS stocks are likely to be abundant at the same time; as abundance levels and markets fluctuate, the CPS fishery as a whole endures by depending on a group of species.

Depending on harvest levels, there is the opportunity for an increase in profitability based on this rule compared to last season due to the higher HG this year.

7.2 No Action—Establish No Harvest Guideline

Implementing the no action alternative allows vessels to harvest coastwide without restriction. The current allocation scheme is set up to allow optimal use of the resource over the long-term. In the absence of the HG, the short term economic benefit of one year might come at the expense of the following year's harvestable biomass.

7.3 Setting a Harvest Guideline Greater than Specified by the FMP

The impacts of this alternative would be similar to the no action alternative. But it is important to acknowledge that, because the harvest of this species was significantly lower than the harvest guideline last year (and for two decades previous to that), it is unlikely that setting a harvest guideline higher than the FMP would influence either the Pacific mackerel stock or the CPS fleet.

7.4 Setting a Harvest Guideline Less than that Specified by the FMP

Setting a harvest guideline less than the proposed 2011/12 harvest guideline could have adverse economic impacts. At an ex-vessel price of $206 (average of 2009 and 2010 ex-vessel), the potential revenue to the fleet would be approximately $6.3 million if the entire ACT were attained. Every 10,000 mt reduction in landings would reduce revenue by approximately $2 million.

8.0 Other Applicable Law

8.1 Regulatory Flexibility Act

An Initial Regulatory Flexibility Analysis (IRFA) was conducted for this action and can be found in Section 7. This analysis is also included in the proposed rule.

8.2 Paperwork Reduction Act (PRA)

This action does not contain a collection-of-information requirement for purposes of the PRA.

8.3 Executive Order 12866 (E.O. 12866)

E. O. 12866 is intended to enhance planning and coordination with respect to both new and existing regulations; to reaffirm the primacy of Federal agencies in the regulatory decision-making process; to restore the integrity and legitimacy of regulatory review and oversight; and to make the process more accessible and open to the public. These proposed specifications are exempt from review under E.O. 12866.

The National Marine Fisheries Service prepares a Regulatory Impact Review (RIR), which includes an analysis of the economic effects of the preferred alternative actions. One of the purposes of the RIR is to comply with the requirements of E.O. 12866. The RIR is intended to assist NMFS in selecting the regulatory approach that maximizes net benefits to the nation. The RIR is contained within the sections of this document and key elements of the RIR are cited below:

- Description of the management objectives: Section 2, Purpose and Need
- Description of the fishery: Section 3, Background
- Statement of the problem: Section 2, Purpose and Need
- Description of each alternative: Section 4, Proposed Action and Alternatives
- Economic Analysis: Section 7: Economic Consequences

8.4 Executive Order 13132 (E.O. 13132)

This action does not contain policies with federalism implications under E.O. 13132.

` **8.5 Information Quality Act**

Pursuant to Section 515 of Public Law 106-554, this information product has undergone a pre-dissemination review by NOAA Fisheries-Southwest Regional Office-Sustainable Fisheries Division, completed on March 29, 2012. The signed Pre-dissemination Review and Documentation Form is on file in that Office and a copy of the form is included with this package. The final rule is substantially unchanged from the proposed rule and no new information has been developed or presented and considered, therefore, the IQA determination remains the same.

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No agencies or persons were consulted for this action.

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Finding of No Significant Impact
2011/2012 Pacific Mackerel Annual Specifications

National Oceanic and Atmospheric Administration Administrative Order 216-6 (NAO 216-6) (May 20, 1999) contains criteria for determining the significance of the impacts of a proposed action. In addition, the Council on Environmental Quality regulations at 40 C.F.R. §1508.27 state that the significance of an action should be analyzed both in terms of *context* and *intensity*. Each criterion listed below is relevant to making a finding of no significant impact and has been considered individually, as well as in combination with the others. The significance of this action is analyzed based on the NAO 216-6 criteria and CEQ's context and intensity criteria. These include:

1) Can the proposed action be reasonably expected to jeopardize the sustainability of any target species that may be affected by the action?

The primary impact to the Pacific mackerel resource as a result of this action is the potential removal of approximately 40,514 mt of Pacific mackerel, as this catch level is the primary management target for the fishery. Once this catch level has been reached the fishery is closed and no retention of Pacific mackerel is allowed in CPS fisheries. The current harvest control rule formula used to determine the HG for Pacific mackerel takes into account the mackerel resource as well as ecosystem and physical environmental factors. This is accomplished through a low harvest fraction (30%), an 18,200 mt threshold below which fishing is prohibited, and recognition that mackerel are caught internationally. These precautions are based on the dynamic nature of the Pacific mackerel stock as well as its importance in the ecosystem as forage for other species.
The current harvest control rule formula also incorporates an 18,200 mt stock biomass threshold, or "cutoff" below which no harvest is allowed. Each year this "cutoff" number of 18,200 mt is subtracted from the overall biomass number before the harvestable biomass is calculated to ensure a minimum spawning biomass is protected. In so doing, the mackerel resource is protected at low or uncertain biomass estimates.

2) Can the proposed action be reasonably expected to jeopardize the sustainability of any non-target species?

This action is not predicted to change incidental catch rates in such a way to jeopardize the sustainability of other fish stocks. The mackerel fishery managed through this action has very low incidental catches of non-target species. The main incidental catch is of other CPS species such as northern anchovy and Pacific sardine. Catch these other species is monitored and accounted for in determining total harvest mortality of each respective stock, therefore ensuring

that incidental catch will not jeopardize the sustainability of these species. Other species are caught in very small quantities, with no likelihood of jeopardizing sustainability. Protected species that may be potential incidental catch are considered separately under question #5.

3) Can the proposed action be reasonably expected to cause substantial damage to the ocean and coastal habitats and/or essential fish habitat as defined under the Magnuson-Stevens Act and identified in FMPs?

This action is not expected to result in substantial damage to the ocean and coastal habitats and/or EFH as defined under the Magnuson-Stevens Act and identified in the FMP. The CPS fishery uses lampara and purse seine gear are generally not associated with adverse impacts to ocean and coastal habitats. The fishery is also prosecuted in pelagic habitats, which, because of their physical characteristics, are not significantly affected by this fishing gear. Although the removal of Pacific mackerel via fishing activities may adversely affect EFH through the removal of a prey resource, the harvest guidelines adequately minimize the adverse effect by ensuring that sufficient numbers of Pacific mackerel remain in the ecosystem, thus adhering to the intent of the EFH provisions of the Magnuson-Stevens Fishery Management Act (Magnuson-Stevens Act), which is to promote the protection, conservation, and enhancement of EFH for the purpose of maintaining sustainable fisheries.

4) Can the proposed action be reasonably expected to have a substantial adverse impact on public health or safety?

Public health and safety issues related to CPS fisheries are discussed and analyzed in the CPS FMP (Appendix D). The proposed action does not substantially change the attributes of CPS fisheries related to safety (such as time, area, and methods) and therefore do not create a derby-style fishery where fishermen feel pressure to fish during an open season where adverse weather or conflicts with other fisheries may exist. Additionally, there are no threats to the public as far as dredging, water intake structures, wastewater, discharge from hazardous substances or coastal development impacts. Therefore, the action is not expected to have a substantial adverse impact on public health or safety.

5) Can the proposed action be reasonably expected to adversely affect endangered or threatened species, marine mammals, or critical habitat of these species?

To date, there is no evidence to suggest that ESA listed sea turtle, marine mammal, and salmonid species are being incidentally taken in the mackerel fishery as it is currently and proposed to be prosecuted, therefore this action is not expected to adversely affect endangered or threatened species, marine mammals, or critical habitat.

To date, there have been nine consultations on the effects of CPS fisheries on endangered and threatened species. Most recently, NMFS SWR Sustainable Fisheries Division initiated a formal section 7 consultation with NMFS SWR Protected Resources Division (PRD) on the operation and prosecution of the Pacific sardine fishery. PRD completed a formal section 7 consultation on this action and, in a Biological Opinion dated December 21, 2010, determined that sardine fishing activities conducted under the CPS FMP and its implementing regulations are not likely to jeopardize the continued existence of any endangered or threatened species under the jurisdiction of NMFS or result in the destruction or adverse modification of critical habitat of any such species. Because the Pacific sardine fishery is operationally similar to the Pacific mackerel fishery and occurs in similar area, except far more restricted (Pacific mackerel fishing primarily only occurs southern and central California), these conclusions are generalizable to the Pacific mackerel fishery.

NMFS also initiated an ESA section 7 consultation with U.S. Fish and Wildlife Service (USFWS) regarding the effects of sardine fishing under the CPS FMP, as amended by Amendment 11 to the CPS FMP. USFWS concurred with NMFS and determined that sardine fishing under the CPS FMP as amended by Amendment 11 may affect, but was not likely to adversely affect: the endangered tidewater goby, the threatened western snowy plover, the Santa Ana sucker, the endangered short tailed albatross, the endangered California brown pelican, the endangered California least-tern, the threatened marbled murrelet, the threatened bald eagle, the threatened bull trout, and the candidate Xantus's murrelet. Formal consultation, however, was deemed necessary on the possible effects to the southern sea otter. The resulting biological opinion (BO) signed June 16, 2006, concluded that fishing activities conducted under Amendment 11 and its implementing regulations were not likely to jeopardize the continued existence of the otter. As a result of this BO, new reporting requirements and conservation measures were implemented in for all CPS fisheries to provide further protection for southern sea otters. Specifically, CPS fishing boat operators and crew are prohibited from deploying their nets if a southern sea otter is observed within the area that would be encircled by the purse seine and must report if any interaction does take place with a sea otter. This management regime continues unchanged under the current CPS FMP, as amended through Amendment 13, and, therefore, the 2006 BO issued by USFWS remains valid and effective. And as previously mentioned, because the Pacific sardine fishery is operationally similar to the Pacific mackerel fishery and occurs in similar area, except far more restricted (Pacific mackerel fishing primarily only occurs southern and central California), these conclusions are generalizable to the Pacific mackerel fishery.

6) Can the proposed action be expected to have a substantial impact on biodiversity and ecosystem function within the affected area (e.g., benthic productivity, predator-prey relationships, etc.)?

This action is not expected to have a substantial impact on biodiversity and ecosystem function within the affected area.

Although Pacific mackerel are a prey item (forage) for some larger species of fish (sharks/tunas) they are not known to be a large component of any species prey base. This action is not expected to substantially change the nature of the CPS fishery, which is currently managed in a precautionary manner by taking into consideration the needs of Pacific mackerel to maintain a sustainable biomass size and taking into consideration the needs of the ecosystem.

7) Are significant social or economic impacts interrelated with significant natural or physical environmental effects?

Anticipated impacts of the proposed action are discussed in the EA in Sections 6 and 7. The EA concludes that while there may be potential economic impacts for any harvest guideline that is established, those impacts are not associated with significant natural or physical environmental effects resulting from fishing activity.

8) To what degree are the effects on the quality of the human environment likely to be highly controversial?

The action is not expected to be highly controversial. The Council's recommendations for the Pacific mackerel fishery were developed through a public review process. The harvest guideline and allocation system for this year will not pose a substantial risk of irreparable harm to the target stock or related resources that might be affected by this action.

9) Can the proposed action be reasonably expected to result in substantial impacts to unique areas, such as historic or cultural resources, park land, prime farmlands, wetlands, wild and scenic rivers or ecologically critical areas?

Fishing for Pacific mackerel occurs within the nearshore pelagic waters of the U.S. Pacific coast and does not have the potential to impact terrestrial based lands or ecosystems (see CPS FMP Appendix D). Mackerel are pelagic at all life stages and contact between the roundhaul type gear used to catch them and bottom substrate is rare because fishing usually occurs in water deeper than the height of the net. Fisheries affected by this action are prosecuted in pelagic habitats, which, because of their physical characteristics, are not significantly affected by the fishing gear. This action will not affect the way in which fisheries are prosecuted such that effects on habitat would change from current conditions. The proposed action affects the location and timing of the harvest of mackerel within limits set

to ensure stock sustainability and account for the role of this species in the ecosystem. Because of the nature of the fishery (purse-seine gear and pelagic habitat) this action will not affect physical characteristics of the environment within the action area.

10) To what degree are the effects on the human environment likely to be highly uncertain or involve unique or unknown risks?

The Pacific mackerel fishery has been carried out in accordance with a fishery management plan since 2000. While there will most likely always be some uncertainties and risks associated with the management process, the uncertainties and risks are factored into the process, through the formulaic approach taken in establishing the annual HG as well as the use of a uncertainty factor in the acceptable biological catch level (ABC) that reduces the ABC and annual catch limit from the overfishing level.

11) Is the proposed action related to other actions with individually insignificant, but cumulatively significant impacts?

This action does not relate to other actions that in combination will result in cumulatively significant impacts. The proposed action is not expected to result in cumulative adverse effects that could have a substantial effect on target or non-target species (see EA Section 6). The harvest level for Pacific mackerel was determined by a risk adverse harvest control rule established by the FMP. Bycatch in CPS fisheries is minimal because fishing operations generally target aggregations of coastal pelagic species. The proposed incidental rate is designed to reduce bycatch in those instances in which Pacific mackerel is mixed in schools of Pacific sardine or market squid following closure of the Pacific mackerel directed fishery. Therefore, the proposed action is not likely to have a substantial effect on any non-target species.

12) Is the proposed action likely to adversely affect districts, sites, highways, structures, or objects listed in or eligible for listing in the National Register of Historic Places or may cause loss or destruction of significant scientific, cultural or historical resources?

This action will have no impacts to these resources as this action does not substantially change the attributes of CPS fisheries and CPS fisheries currently do not affect these areas.
Fishing for Pacific mackerel occurs within the waters of the eastern Pacific ocean, primarily off the coast of western North America and does not have the potential to impact terrestrial based lands or ecosystems (see FMP Appendix D). Mackerel live in the water column, as opposed to living near the sea floor, so fishing gear used to catch them does not typically come into contact with the bottom substrate. Also, there are existing fishing controls on all Federally managed species put in

place to protect special areas, such as rockfish conservation areas (sanctioned by the Pacific Fishery Management Council) and marine sanctuaries (which restrict fishing and boating in certain areas), which make it reasonable to conclude that there are not expected to be any adverse effects to unique or ecologically critical areas. Because of the action area and the nature of the proposed action, historic sites will not be affected by the proposed action.

13) Can the proposed action be reasonably expected to result in the introduction or spread of a non-indigenous species?

Vessels fishing for CPS typically fish relatively close to their home port and fishing activities would have a low risk of spreading any non-indigenous species. Therefore this action is not expected to result in the introduction or spread of any non-indigenous species.

14) Is the proposed action likely to establish a precedent for future actions with significant effects or represents a decision in principle about a future consideration?

This action will not establish a precedent for future actions. Harvest guidelines and annual catch limits and their recommendation and determination process are conducted each year by the Pacific Fishery Management Council and NMFS. Therefore a harvest guideline from one year does not set a precedent or affect the harvest guideline of the following year.

15) Can the proposed action be reasonably expected to threaten a violation of Federal, State, or local law or requirements imposed for the protection of the environment?

This action is not expected to threaten a violation of other Federal, State, or local laws. The process of setting annual harvest guidelines for the mackerel fishery and the fishing itself are a carried out in accordance with federal and state regulatory processes. Neither the guidelines nor the fishing activities threaten to violate any laws imposed for protection of the environment.

16) Can the proposed action be reasonably expected to result in cumulative adverse effects that could have a substantial effect on the target species or non-target species?

This action does not relate to other actions that in combination will result in cumulatively significant impacts. Additionally, non-target catch in the Pacific mackerel extremely low and the harvest level for Pacific mackerel is below the OFL to the extent there is very little risk of hurting the target stock.

DETERMINATION

In view of the information presented in this document and the analysis contained in the supporting Environmental Assessment prepared for this action it is hereby determined that the implementation of the annual specifications for Pacific mackerel will not significantly impact the quality of the human environment. In addition, all beneficial and adverse impacts of the proposed action have been addressed to reach the conclusion of no significant impacts. Accordingly, preparation of an EIS for this action is not necessary.

Kevin Chu

for Rodney R. McInnis
Regional Administrator

5/17/2012
Date