

COASTAL PELAGIC SPECIES MANAGEMENT TEAM REPORT ON FISHERY
MANAGEMENT PLAN MANAGEMENT CATEGORIES- FINAL ACTION

Beginning November 2018, the Pacific Fishery Management Council (Council) embarked on a process to consider removing the concept of categorizing coastal pelagic species (CPS) management unit species, specifically the nomenclature of “Active” and “Monitored” ([Agenda Item E.5.a, CPSMT Report 1, November 2018](#)). This action was prompted by a perceived lack of clarity regarding the meaning and use of the “Active” and “Monitored” stock management categories within the CPS Fishery Management Plan (FMP). Subsequently, the Council directed the Coastal Pelagic Species Management Team (CPSMT) to prepare draft revisions to the CPS FMP in a manner that retains the management approaches for the CPS management unit stocks and describes how each stock is managed in a stock-specific manner, rather than through use of a categorical assignments (see Agenda Item F.4. of [June 2019 Council Meeting Council Record](#)). Specifically, the intent was to remove references to the named management categories, but not to revise the manner in which the CPS stocks are managed.

The CPSMT brought draft amendment text to the Council in November 2021 in [Agenda Item I.2.a, CPSMT Report 1, November 2021](#), which the Council adopted for public review and potential final action at the April 2022 meeting. Attachment 1 under this agenda item contains the full FMP with previously proposed changes in underline/strikethrough.

Also at the November 2021 meeting, the Council directed the CPSMT to explore adding references in the FMP to Council Operating Procedure (COP) 9 and the Stock Assessment and Fishery Evaluation (SAFE) document as part of the management categories amendment. The team explored this and identified potential additions in sections 4.7 and 4.9 of the FMP. The CPSMT provides the draft amendment text of Chapter 4 that the Council examined last November again in Appendix A of this report but with the potential additions to those two sections included for Council consideration.

However, the CPSMT is uncertain whether these additions to the FMP align with the Council direction as described above for the proposed action on management categories. If the Council would like to move forward with these new proposed changes, they may better align with an FMP housekeeping amendment that the team intends to bring forward at a future Council meeting. The team expects to further review and discuss these options at the April Council meeting and present a final recommendation in a supplemental report.

PFMC
3/18/22

Appendix A: Alternative text for CPS FMP Chapter 4, indicated in bold/caps, sections 4.7 and 4.9.

4.0 OPTIMUM YIELD, MAXIMUM SUSTAINABLE YIELD, ACCEPTABLE BIOLOGICAL CATCH, HARVEST CONTROL RULES, AND OVERFISHING DEFINITIONS FOR THE COASTAL PELAGIC SPECIES FISHERY

This FMP defines OY, MSY control rules, and defines overfishing and overfished stocks. All aspects of harvest policies for CPS, including the MSY control rule, definition of overfishing, definition of overfished stocks and rebuilding criteria, can be modified using framework procedures described in Section 2.0.

4.1 Definition of Optimum Yield

The MSA (Section 3(33)) defines the term "optimum," with respect to the yield from a fishery, as the amount of fish which:

- (A) will provide the greatest overall benefit to the Nation, particularly with respect to food production and recreational opportunities, and taking into account the protection of marine ecosystems;
- (B) is prescribed on the basis of the MSY from the fishery, as reduced by any relevant social, economic, or ecological factor; and
- (C) in the case of an overfished fishery, provides for rebuilding to a level consistent with producing the MSY in such fishery.

OY for a CPS stock is defined to be the level of harvest which is less than or equal to ABC estimated using an ABC control rule, consistent with the goals and objectives of this FMP, and used by the Council to manage the stock. The ABC is a harvest specification of a stock or stock complex's annual catch that accounts for the scientific uncertainty in the estimate of OFL (MSY or MSY proxy) and any other scientific uncertainty, and should be based on the ABC control rule. The ABC control rule specifies an approach to setting ABC for a stock or stock complex as a function of the scientific uncertainty in the estimate of OFL and any other scientific uncertainty. In practice, OY will be determined with reference to ABC. Harvest control rules and other OY considerations (economic, social, and ecological) will be used to set ACLs, ACTs, and/or HGs on an annual or multi-year basis. In particular, OY will be set less than ABC to the degree required to prevent overfishing.

4.2 Definition of Overfishing Limits or MSY, and ABC Control Rules

An OFL is an annual amount of catch that corresponds to the estimate of MSY fishing mortality on an annual basis, above which overfishing is occurring applied to a stock or stock complex's abundance expressed in terms of numbers or weight of fish. In general, OFLs for CPS are based on MSY or MSY proxy harvest rates applied to the best available estimate of biomass. In cases where biomass estimates include portions of the population in foreign waters, a DISTRIBUTION term will be used to estimate the percentage of the population in 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). The ABC is decided by the Council based on its preferred level of overfishing risk aversion. The ABC is based on a percentage reduction of the OFL as determined by 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

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by translating the estimated σ to a range of probability of overfishing (P^*) values. The Council then determines the preferred level of risk aversion by selecting an appropriate P^* value, accordingly. Each P^* value is then matched to its corresponding BUFFER fraction that is applied to the OFL according to the ABC control rule.

OFL	BIOMASS * F_{MSY} * DISTRIBUTION
ABC	BIOMASS * BUFFER * F_{MSY} * DISTRIBUTION

To some extent, the existing harvest control rules for ~~Actively-some~~ managed species merge scientific uncertainty and OY considerations thereby providing additional reductions from OFL levels, particularly during warm temperature regimes. Therefore, harvest control rules will be considered in conjunction with ABC control rules to prevent overfishing (see Section 4.6).

4.3 Definition of Overfishing

By definition, overfishing occurs in a fishery whenever fishing occurs over a period of one year or more at a rate that is high enough to jeopardize the capacity of the stock to produce MSY on a continuing basis if applied in the long term. Overfishing in the CPS fishery is "approached" whenever projections indicate overfishing will occur within two years. The definition of overfishing is in terms of a fishing mortality or exploitation rate. Depending on the exploitation rate, overfishing can occur when CPS stocks are at either high or low abundance levels. The Council must take action to eliminate overfishing when it occurs and to avoid overfishing when exploitation rates approach the overfishing level.

In operational terms, overfishing occurs in the CPS fishery whenever catch exceeds OFL and overfishing is approached whenever projections indicate that fishing mortality or exploitation rates will exceed the OFL level within two years. The definition of an overfished stock is an explicit part of the harvest control rule for CPS stocks.

4.4 Definition of an Overfished Stock

By definition, an overfished stock in the CPS fishery is a stock at a biomass level low enough to jeopardize the capacity of the stock to produce MSY on a continuing basis. An overfished condition is approached when projections indicate that stock biomass will fall below the overfished level within two years. The Council must take action to rebuild overfished stocks and to avoid overfished conditions in stocks with biomass levels approaching an overfished condition.

4.5 Rebuilding Programs

Management of overfished CPS stocks must include a rebuilding program that can, on average, be expected to result in recovery of the stock to MSY levels in ten years. It is impossible to develop a rebuilding program that would be guaranteed to restore a stock to the MSY level in ten years, because CPS stocks may remain at low biomass levels for more than ten years even with no fishing. The focus for CPS is, therefore, on the average or expected time to recovery based on realistic projections. If the expected time to stock recovery is associated with unfavorable ecosystem conditions and is greater than ten years, then the Council and the U.S. Secretary of Commerce (Secretary) may consider extending the time period as described at 50 CFR § 600.310(e).

Rebuilding programs for CPS may be an integral part of the harvest control rule or may be developed or refined further in the event that biomass of a CPS stock reaches the overfished level. If a stock is overfished,

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for the period between when it is determined to be overfished and the effective date of a rebuilding plan, the Council shall consider whether to allow any harvest of the overfished stock and what the appropriate interim harvest level should be.

4.5.1 *Rebuilding Plan for Pacific Sardine*

In July 2019, the National Marine Fisheries Service notified the Council that it had declared the Pacific sardine stock overfished. The declaration came as a result of the 2019 Pacific sardine stock assessment indicating that the stock had declined below its MSST of 50,000 mt. A rebuilding plan was adopted by the Council in September 2020. The rebuilding reference points for Pacific sardine are:

$T_{min} = 12$ years

$T_{max} = 24$ years

$T_{target} = 14$ years

Rebuilding target = 150,000 mt of age 1+ biomass

Total catch limits (i.e., OFL/ABC/ACL) will be set annually based on annual stock assessments and the control rules in the FMP and recommendations from the SSC regarding uncertainty in the assessment and OFL.

The management measures under the Pacific sardine Rebuilding Plan include the following:

- The primary directed fishery for Pacific sardine will be closed until the biomass reaches or exceeds 150,000 mt (i.e., the Rebuilding target and CUTOFF in the HG control rule);
- Incidental limits in other primary directed CPS fisheries are restricted to no more than 20 percent Pacific sardine per landing until the biomass reaches or exceeds 50,000 mt (i.e., the MSST for Pacific sardine);
- The minor directed fisheries are limited to 1 mt of Pacific sardine per trip per day;
- Live bait harvest is not specifically constrained under the Rebuilding Plan but is subject to management measures that will be reviewed during the Council's annual specifications process; and
- Other management measures the Council may recommend (e.g., incidental catch limits in non-CPS fisheries)

The population dynamics of small coastal pelagic fish such as Pacific sardine are highly influenced by environmental conditions. Although fishing pressure can also impact the population dynamics of small pelagics, it is generally agreed that under current sardine management, harvest is a lesser factor in sardine population status than environmental factors. Historical analysis of marine sediment layers (Baumgartner et al, 1992) conclude that the sardine population is prone to long periods of decline even in the absence of fishing.

4.6 Harvest Control Rules

For CPS, a harvest control rule is defined to be a harvest strategy that provides biomass levels at least as high as the F_{MSY} approach while also providing relatively high and relatively consistent levels of catch.

According to Federal regulations (50 CFR '600.310(b)(1)(ii)), an MSY control rule is "a harvest strategy which, if implemented, would be expected to result in a long-term average catch approximating MSY." Similarly, MSY stock size "means the long-term average size of the stock or stock complex, measured in terms of spawning biomass or other appropriate units that would be achieved under an MSY control rule in which the fishing mortality rate is constant." Harvest specifications as estimated by the harvest control rule shall not exceed ABC or the harvest recommendations of the SSC. Rather, harvest control rules will be considered in conjunction with ABC control rules to prevent overfishing. The CPS harvest control rules for Actively managed species are more conservative than MSY-based management strategies, because the focus for CPS is oriented primarily towards stock biomass levels at least as high as the MSY stock size while reducing harvest as biomass levels approach overfished levels. The primary focus is on biomass, rather than catch, because most CPS (Pacific sardine, northern anchovy, and market squid) are very important in the ecosystem for forage.

Harvest control rules in the CPS fishery may vary depending on the nature of the fishery, management goals, assessment and monitoring capabilities, and available information. Under the framework management approach used for CPS, it is not necessary to amend the CPS FMP in order to develop or modify harvest control rules or definitions of overfishing. The CPS FMP includes two primary forms of harvest control rules for CPS, the default control rule and the general control rule.

~~The use of a harvest control rule for Actively managed stocks~~ CPS stocks and fisheries with biologically significant levels of catch, or biological, or socio-economic considerations requiring relatively intense harvest management procedures must have stock-specific harvest control rules, a definition of overfishing and a definition of an overfished stock. The purpose of the general harvest control rule, described below, is to provide managers with a tool for setting and adjusting harvest levels on a periodic basis while preventing overfishing and overfished stock conditions. ~~All Actively managed stocks must have stock-specific harvest control rules, a definition of overfishing and a definition of an overfished stock.~~

~~The main use of a harvest control rule for a Monitored stock is to help gauge the need for Active management.~~ CPS stocks and fisheries without biologically significant levels of catch or biological, or socio-economic considerations requiring relatively intense harvest management procedures do not require stock specific harvest control rules. For these rules, the main use of harvest control rules is to help gauge the need for setting and adjusting harvest levels on a more frequent basis. These types of ~~Harvest~~ harvest control rules and harvest policies for ~~Monitored~~ CPS stocks may be more generic and simple than those for ~~Actively managed~~ stocks with significant fisheries. Any stock supporting catches approaching the ABC or MSY levels should be ~~Actively managed~~ with periodic adjustments unless there is too little information available or other practical problems.

4.6.1 *Default CPS Harvest Control Rule*

The Council may use the default harvest control rule, defined below, for ~~Monitored~~ species where it has been determined that little need for intensive management exists unless a better species-specific rule is available. The default harvest control rule can be modified under framework management procedures.

The default harvest control rule (~~intended primarily for stocks that are Monitored~~) sets ABC for the entire stock (U.S., Mexico, Canada, and international fisheries) equal to 25 percent of the best estimate of the MSY catch level. Overfishing occurs whenever the total catch (U.S., Mexico, Canada, and international fisheries) exceeds ABC or whenever fishing occurs at a rate that is high enough to jeopardize the capacity of the stock to produce MSY. Overfishing of a ~~Monitored~~ CPS stock managed using the default control rule is "approached" whenever projections or estimates indicate that the overfishing will occur within two years.

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In making decisions about ~~Active management~~ using the general control rule or another stock-specific control rule, the Council may choose to consider ABC and catches in U.S. waters only. ABC in U.S. waters is the ABC for the entire stock prorated by an estimate of the fraction of the stock in U.S. waters. ~~Active management~~ Management may not be effective if U.S. catches are small and overfishing is occurring in Mexico, Canada, or in international waters outside the jurisdiction of Federal authorities.

General Harvest Control Rule for Actively Managed Species

The general form of the harvest control rule utilized for the California CPS fisheries was designed to continuously reduce the exploitation rate as biomass declines. The general formula used is:

$$H = (\text{BIOMASS-CUTOFF}) \times \text{FRACTION} \times \text{DISTRIBUTION}$$

H is the harvest target level, CUTOFF is the lowest level of estimated biomass at which directed harvest is allowed and FRACTION is the fraction of the biomass above CUTOFF that can be taken by the fishery. BIOMASS is generally the estimated biomass of fish age 1+ at the beginning the season. DISTRIBUTION is the average portion of biomass assumed in U.S. waters. 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. It may be useful to define any of the parameters in this general harvest control rule so that they depend on environmental conditions or stock biomass. Thus, the harvest control rule could depend explicitly on the condition of the stock or environment.

The formula generally uses the estimated biomass for the whole stock in one year (BIOMASS) to set harvest for the whole stock in the following year (H) although projections or estimates of BIOMASS, abundance index values or other data might be used instead. BIOMASS is an estimate only, it is never assumed that BIOMASS is a perfect measure of abundance. Efforts to develop a harvest formula must consider probable levels of measurement error in BIOMASS which typically have CVs of about 50 percent for CPS.

The general harvest control rule for CPS (depending on parameter values) is compatible with the MSA and useful for CPS that are important as forage. 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 if a stock becomes 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 may be 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} . In addition to the CUTOFF and FRACTION parameters, it may be advisable to define a maximum harvest level parameter (MAXCAT) so that total harvest specified by the harvest formula never exceeds MAXCAT. MAXCAT is used to guard 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. MAXCAT also prevents the catch from exceeding MSY at high stock levels and spreads the catch from strong year classes over a wider range of fishing seasons.

ACLs will be set no higher than ABC and may be sector-specific. Harvest control rules and other OY considerations will be used to set an HG. The HG cannot exceed the ACL or ABC. In cases where the HG exceeds the ABC, the Council will set a lower ACL, HG, or ACT in response. 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.

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

Other general types of control rules may be useful for CPS and this FMP does not preclude their use as long as they are compatible with National Standards and the MSA.

Transboundary Issues

Management of transboundary stocks is one of the most difficult problems in the management of CPS. Ideally, transboundary CPS stocks would be managed cooperatively by the U.S., Canada, and Mexico on the basis of common policy. At present, there are no cooperative management agreements with Mexico or Canada.

In the absence of a cooperative management agreement, the default 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 resident in U.S. waters or estimating the biomass in U.S. waters only. In practice, this approach is similar to managing the U.S. and Mexican portions of a stock separately, since harvest for the U.S. fishery in a given year depends ultimately on the biomass in U.S. waters.

Other approaches that may be developed in the future are not precluded by this default. If the portion of the stock in U.S. waters cannot be estimated or is highly variable, then other approaches may be used. It may be more practical, for example, to use a high CUTOFF in the harvest control rule to compensate for stock biomass off Mexico or Canada.

4.6.2 Harvest Control Rule for Pacific Sardine¹

The Harvest Control Rule for Pacific sardine includes OY considerations and will be used to calculate an HG or ACT for the entire sardine stock, but cannot exceed ABC. The harvest control rule is based on an estimate of biomass for the whole sardine stock, a CUTOFF equal to 150,000 mt, a FRACTION² between five percent and 15 percent (depending on oceanographic conditions as described below), a U.S. DISTRIBUTION of 87 percent, and MAXCAT of 200,000 mt. The U.S. ABC is calculated from the target

¹ In November 2014, the Council adopted a revised temperature-recruitment relationship, established a new temperature index, and adopted a revised FRACTION range. The new temperature-recruitment relationship is $E_{MSY} = -18.46452 + 3.25209(T) - 0.19723(T^2) + 0.0041863(T^3)$. The new temperature index is the California Cooperative Oceanic Fisheries Investigations (CalCOFI) time series, and the revised harvest FRACTION range is 5-20%. These are described in the November 2014 Council briefing book materials.

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harvest for the whole stock by prorating the total ABC based on proportion of total biomass in U.S. waters.

FRACTION in the harvest control rule for Pacific sardine is a proxy for F_{MSY} (i.e., the fishing mortality rate for deterministic equilibrium MSY) that builds in OY considerations and other precautions to avoid overfishing. FRACTION depends on recent ocean temperatures because F_{MSY} and productivity of the sardine stock is higher under ocean conditions associated with warm water temperatures (Appendix B, Section 4.2.3.4). An estimate of the relationship between F_{MSY} for sardine and ocean temperatures is:

$$F_{MSY} = 0.248649805 T^2 - 8.190043975 T + 67.4558326^2$$

where T is the average three season sea surface temperature at Scripps Pier, California during the three preceding seasons. The harvest control rule for sardine sets the control rule parameter FRACTION equal to F_{MSY} except that FRACTION is never allowed to be higher than 15 percent or lower than 5 percent. OFL and ABC calculations may be limited to a range of sea-surface temperatures dependent upon the recommendation of the SSC and based on the best available science. For example, under the analysis for Amendment 13, the CPSMT and the SSC recommended limiting OFL and ABC calculations by the interquartile range of SSTs, which span three-season averages from 1916-19 through 1994-97. The lower quartile SST for this period was 16.61 °C, with a corresponding F_{MSY} of 0.0200. The upper quartile SST was 17.33 °C, with an F_{MSY} of 0.1985.

Although F_{MSY} may be greater or lesser, FRACTION can never be greater than 15 percent or less than 5 percent unless the harvest control rule for sardine is revised, because 5 percent and 15 percent are policy decisions taken by Council based on social, economic, and biological criteria. In contrast, relationships between FRACTION, F_{MSY} , and environmental conditions are technical questions and estimates or approaches may be revised by technical teams to accommodate new ideas and data.

The temperature-dependent F_{MSY} for sardine is unique among F_{MSY} definitions for Council-managed species; to some extent, the existing sardine harvest control rule provides substantial reductions in harvest relative to F_{MSY} , particularly during warm temperature regimes.

4.6.2.1 Definition for Overfished Stock for Sardine

An overfished sardine population is one with a 1+ stock biomass on July 1 of 50,000 mt or less. The Council is required to minimize fishing mortality on an overfished stock to the extent practicable and to undertake a rebuilding program which may be implicit to the harvest control rule or explicit. See Section 4.5 for the Pacific sardine rebuilding plan.

4.6.2.2 Live Bait Harvest between the ABC and CUTOFF

The live bait fishery which supplies live CPS to recreational and commercial fisheries may be allowed to operate when estimated biomass falls below the CUTOFF, which is currently set at 150,000 mt and other directed fishing is precluded but is still above the definition of an overfished stock, and live bait harvest is not expected to exceed the ACL or ABC. This does not prevent the Council from undertaking any measure authorized under this FMP, including a sector-specific ACL, that may be necessary to manage the live bait fishery and sardine stock. The live bait fishery could, for example, be managed by HG or quota, season, or gear restrictions at any point under the framework management process.

4.6.3 Harvest Control Rule for Pacific (Chub) Mackerel

The harvest control rule for Pacific mackerel sets the CUTOFF and the definition of an overfished stock at 18,200 mt, FRACTION at 30 percent, and a U.S. DISTRIBUTION of 70 percent. Overfishing is defined

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as any fishing in excess of ABC calculated using the harvest control rule. No MAXCAT is defined because the U.S. fishery appears to be limited to about 40,000 mt per year by markets. The target harvest level is defined for the entire stock in Mexico, Canada, and U.S. waters (not just the U.S. portion), and the U.S. target harvest level is prorated based on relative abundance in U.S. waters.

4.6.4 ~~Monitored Stocks~~Harvest Control Rules for Northern Anchovy, Jack Mackerel, and Market Squid

Management of Northern ~~Northern~~ northern anchovy (northern and central subpopulations), jack mackerel and market squid will, ~~be monitored~~ at the outset of the CPS FMP, ~~use~~ the ~~the~~ default control rules and overfishing specifications ~~will be used for Monitored stocks~~. Stock specific MSY proxies, ABC, and ACLs can be revised based on the best available science as recommended by the SSC and as adopted through the annual harvest specification process, and will be reported in the CPS SAFE.

The OFL will be based on species-specific MSY proxies. In general, the default ABC control rule consists of a 75 percent reduction from OFL to ABC until such time as the SSC recommends an alternate value based on the best available science. ACLs would be specified for multiple years until such time as the species becomes ~~actively~~ managed using the general harvest control rule or a new species-specific control rule, or new scientific information becomes available. ACLs may also be sector-specific.

OFL	STOCK SPECIFIC MSY PROXY
ABC	OFL * 0.25
ACL	Equal to ABC or reduced by OY considerations.

4.6.4.1 Northern Anchovy-Central Subpopulation

The central subpopulation of northern anchovy ranges from approximately San Francisco, California, to Punta Baja, Mexico. The ABC would then be prorated by the DISTRIBUTION of the stock in U.S. waters (82 percent) to arrive at ABC in U.S. waters.

4.6.4.2 Northern Anchovy-Northern Subpopulation

The northern subpopulation of northern anchovy ranges from San Francisco north to British Columbia, with a major spawning center off Oregon and Washington that is associated with the Columbia River plume. The northern subpopulation supports small but locally important bait and human consumption fisheries. Northern anchovy is an important source of forage to local predators, including depleted and endangered salmonid stocks.

Additionally, the portion of the northern subpopulation of northern anchovy resident in U.S. waters is unknown. It is likely that some biomass occurs in Canadian waters off British Columbia.

MSY for the northern subpopulation of northern anchovy is specified as an F_{MSY} of 0.3. This value (the default exploitation rate for Pacific mackerel) is considered the best available science and an appropriate specification of MSY, as northern anchovy are likely to be as productive and have a higher natural mortality than Pacific mackerel, for which there is much greater understanding of productivity and biology.

4.6.4.3 Jack Mackerel

The ABC level for jack mackerel is calculated by age/area from mid-range potential yield values. ABC in

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U.S. waters will be prorated according to the DISTRIBUTION of the stock in U.S. waters (65 percent). If jack mackerel catches increase and become significant, managers may decide to address management of different age groups and areas independently. This question does not need to be addressed at this time because catches are low (generally less than 2,000 mt per year since 1990).

4.6.4.4 Market Squid

The MSY Control Rule for market squid is founded generally on conventional spawning biomass “per recruit” model theory. Specifically, the MSY Control Rule for market squid is based on evaluating (throughout a fishing season) levels of egg escapement associated with the exploited population. The estimates of egg escapement are evaluated in the context of a “threshold” that is believed to represent a minimum level that is considered necessary to allow the population to maintain its level of abundance into the future (i.e., allow for “sustainable” reproduction year after year). In practical terms, the Egg Escapement approach can be used to evaluate the effects of fishing mortality (F) on the spawning potential of the stock, and in particular, to examine the relation between the stock’s reproductive output and candidate proxies for the fishing mortality that results in MSY (F_{MSY}).

The fishing mortality (F_{MSY}) that results in a threshold level of egg escapement of at least 30 percent will be used initially as a proxy for MSY. However, it is important to note that the level of egg escapement will be reviewed on an intermittent basis as new information becomes available concerning the dynamics of the stock and fishery, to ensure that the proposed threshold meets its objective as a long-term, sustainable biological reference point for this marine resource. This is not a trivial exercise, given the need for ongoing research regarding the biology of this species, which may result in revised recommendations in the future. Ultimately, the market squid fishery can operate freely, within the constraints of currently adopted regulations as dictated by the CDFG (e.g., annual landings cap, weekend closures, closed areas) and NMFS, as long as egg escapement is equal to, or greater than, the threshold value. Assessments will be conducted on a yearly basis for the first two years (2002-04) and on a multi-year basis beginning in 2005. In the event that egg escapement is determined to be below the 30 percent threshold for two successive years, then a point-of-concern would be triggered under the FMP’s management framework, and the Council could consider ~~moving~~ revising market squid ~~from Monitored to Active~~ management status. Current state regulations for squid are not anticipated to change in the near future, however, should existing laws limiting effort or harvest be rescinded, further management actions by the Council could also be considered.

As noted, the Council and state authorities will continue to monitor squid landings. If landings increase or a biological risk to the stock develops, the Council can be expected to ~~promote~~ revise squid ~~to Active~~ management quickly under the "point-of-concern" framework management procedures (Section 2.1.2).

4.6.5 Prohibited Harvest Species

Prohibited Harvest Species management includes all species of krill occurring in the West Coast EEZ and is intended to ensure that, to the extent practicable, fisheries will not develop that could put at risk krill stocks and the other living marine resources that depend on krill. This means that OY for krill is zero, and the target, harvest and transshipment of krill is prohibited. Also, EFPs will not be issued under the EFP procedures of this FMP to allow individuals to harvest krill as an exception to the prohibition of harvest. These actions would fully achieve the objectives of the ~~amendment~~ Amendment 12 to the extent practicable, but would not account for environmental conditions and the responses of krill and other resources to changes in environmental conditions. Prohibited Harvest Species ~~This management category~~ recognizes that *de minimis* or trace amounts of krill may be retained by fishermen while targeting other species; such inadvertent action is not intended to be the subject of this prohibition.

4.7 Stock Assessment and Fishery Evaluation Report

The CPSMT will prepare an annual SAFE report describing the status of the CPS fishery. The SAFE report provides information to the councils for determining annual harvest levels for each stock, documenting significant trends or changes in the resource, marine ecosystems, and fishery over time, and assessing the relative success of existing state and Federal fishery management programs. This includes landings, prices, revenues, and economic, biological or environmental conditions not covered elsewhere in assessments for ~~Actively managed~~ CPS species. In particular, the SAFE report shall include:

1. Current status of CPS resources.
2. A description of the maximum fishing mortality threshold and the minimum stock size threshold for each stock or stock complex, along with information by which the Council may determine:
 - (a) Whether overfishing is occurring with respect to any stock or stock complex, whether any stock or stock complex is overfished, whether the rate or level of fishing mortality applied to any stock or stock complex is approaching the maximum fishing mortality threshold, and whether the size of any stock or stock complex is approaching the minimum stock size threshold.
 - (b) Any management measures necessary to provide for rebuilding an overfished stock or stock complex (if any) to a level consistent with producing the MSY in such fishery.
3. The total and U.S. target levels, if calculated, along with all available information about bycatch, DAH, domestic annual processing (DAP), JVP, and TALFF used to specify HGs or quotas.
4. Recent and historical catch statistics (landings and value).
5. Recommendations for use of HG or quotas by species.
6. A brief history of the harvesting sector for the fishery.
7. A brief history of CPS management.
8. A summary of recent economic conditions, including information such as status of fleet capacity, number of vessels and performance by gear type, including recreational and commercial fishing interests, fishing communities, and fish processing interests.
9. Safety considerations.
10. Ecosystem information including ecological factors that may inform decisions on SDCs, harvest specifications, and management measures.
11. Bycatch summary.
12. Any necessary expansions to previous environmental and regulatory impact documents, and ecosystem and habitat descriptions.
13. Other relevant biological, sociological, economic, and ecological information that may be useful to the Council.

14. INFORMATION ON RECENT AND UPCOMING ASSESSMENTS AND REFERENCE TO THE ASSESSMENT SCHEDULES AND PROCESSES SPECIFIED IN COP 9 SCHEDULE 3.

The Council will notice the availability of SAFE reports via mailing lists and the Council newsletter and will publish SAFE reports primarily via the Council web page. Paper copies will be provided on request.

Monitored Species

The annual SAFE report prepared by the CPSMT will include all available information that may be used to determine if a point-of-concern exists (e.g., overfishing) or if a stock should be considered for ~~Active changes in its management or for Monitored management~~. ~~At a minimum, the report should contain landings data for Monitored stocks and any available information about trends in abundance.~~

4.8 Annual Specifications and Announcement of Harvest Levels

Each year, the Secretary will publish in the *Federal Register* the final specifications for all CPS ~~Actively~~

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annually managed by the Council. The total U.S. harvest will be allocated to the various fisheries as ACLs, HGs or ACTs, or as quotas.

In calculating ACLs, ACTs, HGs and quotas for each species, an estimate of the incidental catch of each species caught while fishermen are targeting other species will be taken into account. Therefore, the total HG will consist of an incidental catch portion and a directed fishery portion. In general, HGs or ACTs will be used to describe direct and incidental take, will set in accordance with harvest control rules, and will be below the ACL to take into account management uncertainty and additional known sources of mortality such as discards, bycatch, research take, and live bait fisheries. This will be done to minimize the chances of exceeding the target harvest levels and the ACL.

If the HG, ACL, or ACT for the directed fishery is reached the directed fishery will be closed by an automatic action and incidental catch will continue to be allowed under the incidental catch allowance, which is expressed in an amount of fish or a percentage of a load (Section 5.1). Minor directed fishing will also be allowed to continue after a directed fishery is closed, unless otherwise specified by the Council, or an ACL is anticipated to be exceeded (Section 5.2). If the estimated incidental catch portion of the HG, ACL, or ACT has been set too high, resulting in the probability of not attaining the target harvest level by the end of the fishing season, the remaining incidental catch portion may be allocated to the directed fishery through the "routine" management procedures. This reallocation of the remaining incidental catch portion of the HG to the directed fishery is not likely to be necessary unless substantial errors are discovered in calculations or estimates.

4.8.1 *General Procedure for Setting Annual Specifications*

The intent of the management approach under the FMP is to reassess the status of each ~~Actively managed~~ species for which the Council has determined a need at frequent intervals and preferably every year (although a full analytic stock assessment may not be necessary or possible in some cases). The general procedure for making the annual specifications for CPS is as follows:

1. The CPSMT will produce a SAFE report as specified in Section 4.7 that documents the current estimates of biomass for each CPS assessed and status of the fishery. In the report, the CPSMT will recommend either HGs or quotas ~~for Actively managed species~~, including a directed portion and an incidental portion, an initial incidental catch allowance to be used when HGs are reached together with an estimate of total incidental catch, and will make all calculations of the specifications as required by this FMP.
2. Documents will be sent to the NMFS Regional Administrator, Southwest Region, the Council, members of the Council's SSC, members of the CPSAS, and all interested parties for review.
3. A public meeting or meetings will be announced in the *Federal Register* and held with the CPSMT and the CPSAS to discuss the proposed annual specifications and to obtain public comments.
4. At its first opportunity, the Council will review all information compiled for the annual specifications, consult with its SSC, CPSMT, CPSAS, and hear public comments. The Council also will review any important social and economic information at that time, then make a recommendation to the NMFS Regional Administrator on the final specifications, including OFL, ABC, OY levels, ACLs, ACTs, HGs, quotas, allocations, and other management measures for the fishing season.
5. Following the Council meeting, the NMFS Regional Administrator will consider all comments and make a determination of the final specifications. This determination will be published in the *Federal Register* with a request for additional public comment.
6. Alternate Procedure: If assessment and season schedules warrant, the NMFS Regional Administrator may make preliminary harvest specifications quickly (without prior discussion at a Council meeting) to allow fishing to begin without delay. As soon as practicable, the Council will review all background

documents contributing to the determination of the biomass estimates and make a final recommendation for the resulting target harvest level, HGs and quotas. Following the meeting of the Council, the NMFS Regional Administrator will consider all comments and make a determination of whether any changes in the final specifications are necessary. If such changes are warranted, they will be published in the *Federal Register*.

If assembling the data and producing a report would require enough time that permitting a complete public review before the beginning of the fishing season could reduce the season, then this alternate procedure should be used.

7. NMFS and the west coast states will monitor the fishery throughout the year, tracking incidental catch, ACTs, and HGs and quotas. If an HG or quota for any species is or is likely to be reached prematurely, a "point of concern" will occur, triggering a mandatory review of the status of the stock. If the directed harvest portion of an ACT or ACL, HG, or quota is reached, then directed fishing will be prohibited and the pre-specified incidental trip limit will be imposed as an automatic action through publication of a notice in the *Federal Register*.

The NMFS Regional Administrator would be responsible for setting the HGs based on the estimated biomass and the standards set in the FMP. The formulas used to set HGs for CPS are straightforward and provide little latitude for judgment, therefore, there is less discretion involved in setting annual specifications for CPS than for other fisheries.

HGs for CPS are based on the current biomass estimate multiplied by a fixed harvest rate. The portion of the resource in U.S. waters may change over time, but in any one year is the best estimate available. The amount of the HG needed for incidental trip limits when the fishery is nearing closure will vary depending on when the HG is projected to be achieved, but the incidental amount and the amount harvested directly must equal the total HG.

Following the determination of the estimated biomass, a public meeting would be held between the CPSMT and CPSAS. The biomass estimate and resultant HG would be reviewed, public comments obtained, and all information forwarded to the Council. At its meeting, the Council, after hearing public comments, would either adopt the annual specifications or recommend changes, accompanied by a justification for why the change should be made.

The intention of the proposed regulations is to have public review of and a Council recommendation on the estimated biomass and HGs before the fishing season begins; however, the NMFS Regional Administrator is not precluded from announcing the HGs in the *Federal Register* before the process is completed so that fishermen can plan their activities and begin harvesting when the fishing season begins.

4.8.2 Factors Considered

The following factors will be considered when making the annual specifications:

1. The current estimated biomass and any other biological information.
2. The harvest control rule described in the FMP, which is specific for each ~~Actively~~ annually managed species.
3. Results of comments of domestic processors and joint venture operations about processing capacity and planned utilization.
4. Results of an analysis of the fishing capacity and planned utilization of recent years modified by new information and comments by the fishing industry relating to intended use.

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5. Information on ecological factors such as the status of the ecosystem, predator-prey interactions, or oceanographic conditions that may warrant additional ecosystem-based management considerations.
6. Any relevant historical information on the utilization of CPS resources.

All data used to make annual specifications will be available for public inspection during normal business hours at the Southwest Regional Office of NMFS.

4.8.3 Guidelines for Choosing Between a Harvest Guideline and Quota

HGs or quotas generally function as ACTs and can be specified as such. The maximum HG is derived by the harvest control rule in place for ~~actively or monitored~~ each stocks. The Council may adopt the maximum HG so long as it is below the established ACL. Additionally, the Council will consider potential factors that may contribute to exceeding an HG, quota, or other ACT to determine if the recommended harvest target is sufficiently low to avoid exceeding the ACL.

Quotas are specified numerical harvest objectives, the attainment of which results in automatic closure of the fishery for that species. Retention, possession, and landing of a species after attainment of its quota is prohibited. A quota is a single numerical value, not a range.

HGs are specified numerical harvest objectives that differ from quotas in that closure of a fishery (i.e., prohibition of retention, possession, and landing) is not automatically required upon attainment of the objective. An HG may be either a range or a point estimate.

The preferred approach for managing domestic coastal pelagic resources is by HG. Foreign fisheries will normally be managed by quotas. HGs are used for the domestic fishery because bycatch of one CPS is common when fishing for another, and curtailing the harvest of one species may limit the harvest of another and prevent achieving target harvest levels.

HGs and/or ACTs will be used as long as the following conditions are met:

1. Allowing an imprecise cap on total harvest will still ensure long-term productivity of the resource and the economic well-being of the fishery and dependent species and is unlikely to exceed an ACL.
2. Unavoidable bycatch would occur after a quota was reached and further landings prohibited, curtailing the harvest of other resources or creating discards.
3. Fishing in excess of an HG or ACT is not expected to significantly affect future yields or exceed an ACL.
4. Overfishing is not likely to occur.

Generally, a quota will not be used for domestic fisheries unless extra protection of an individual species becomes important. Foreign fishing allocations will generally be quotas. Quotas should be used for domestic fisheries when:

1. A high degree of protection of one species is needed to ensure the future well-being of the fishery or dependent species.
2. Permitting bycatch after an HG is reached cannot be accepted if the objectives of the FMP are to be met.
3. Fishing in excess of an HG would significantly affect future yields or exceed an ACL.
4. Overfishing may occur and is less likely under quota management.

The choice of a numerical specification of an HG, ACT, or quota is based on a balance of its social, economic, biological, and ecological effects as stated above.

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4.9 Annual Assessment and Management Cycles

This FMP specifies that ~~annual~~ schedules for ~~Actively managed~~ annually assessed CPS be developed based on the Council's workload and meeting schedule, opportunity for industry and technical review of biomass estimates and HGs or quotas, seasonal patterns in the fishery, collection and processing of CalCOFI data during the peak spawning season, collection of other data, time required for notification of fishers, and workload of the CPSMT and CPSAS. The FMP does not specify what those schedules will be, since they will be implemented through regulations.

The annual assessment and management cycles determine the start and close date (season) for each ~~Actively managed~~ annually assessed fishery. These may be changed by abbreviated rulemaking as described in Section 2.1.

DETAILED MANAGEMENT SCHEDULES AND PROCESSES FOR CPS FISHERIES ARE FOUND IN COUNCIL OPERATING PROCEDURE 9, SCHEDULE 3.