

Chapter 5. Fishery Management Program

This WSFMP establishes a fisheries management program for white seabass and procedures by which the Commission will manage the white seabass resource and the various fishery components. It also sets the limits of management authority for the Commission when acting under the WSFMP. Management measures implementing the WSFMP, which directly control fishing activities, must be consistent with the goals and objectives of the WSFMP, MLMA, and other applicable laws. These management actions are to be considered annually with an exception that provides for more timely Commission action under certain specific conditions. Procedures in this FMP do not affect the authority of the Director of the Department of Fish and Game to take emergency regulatory action under §7710 FGC.

5.1 Potential Management Measures

This Section of the FMP describes potential management measures and their application for the white seabass fisheries. The Commission, may on the recommendation of the White Seabass Scientific and Constituent Advisory Panel (WSSCAP), implement these management measures or others, as appropriate, on an annual basis. The Commission may also implement any of these measures when action is deemed necessary under authority of the points of concern process (see Section 5.4.1) and the socioeconomic process (see Section 5.4.2). In addition to the following management measures, other types of actions may also be valid and are intended to be available to the Commission providing they are consistent with the criteria and procedures contained in this WSFMP.

Harvest Control

A harvest control rule is a numerical harvest objective which differs from a quota in that closure of a fishery (prohibition of retention, possession or landing) is not automatically required when the guideline is reached. A harvest control rule may be a range or a point estimate. Bycatch may be allowed after a harvest control rule is reached although some allowance for bycatch is usually made when the harvest control rule is set.

Quotas

Quotas are specified harvest limits that, once attained, cause closure of the fishery for that species, gear type or geographic area. Quotas may be established for intentional allocation purposes, to terminate harvest at a specified point, or other purpose. They may be specified for a particular area, gear type, time period, species, or species group.

Bycatch

Regulation of bycatch is often necessary to limit or prohibit the take of a species that occurs incidentally while catching another species. Management measures to regulate bycatch include but are not limited to an incidental allowance or an overall incidental

reserve that is subtracted from the total harvest control rule or quota.

Time (Season)/Area Closures

Time (season or time of day) and area closures have traditionally been used to regulate fisheries. Time/area closures may also be used to reduce conflict between user groups or for other uses. Various seasonal and area closures for fisheries exist in California.

Landing Limits and Trip Frequency Limits

A trip or landing limit is the amount of a managed species that may be taken and retained, possessed, or landed from a single fishing trip or during a specified period of time. A trip frequency limit is a limit on the number of trips during a specified period of time. Trips may be defined in various ways depending on circumstances. Trip landing limits and trip frequency limits are used to delay reaching a quota or harvest control rule and avoid premature closure of a fishery. They can be utilized to minimize targeting on a species while allowing landings of some level of incidental catch. Trip landing and frequency limits may also be used to discourage waste by limiting landings to amounts that can be used by available markets and/or processing capabilities.

Allocation

Allocation is the apportionment of harvest to or among particular individuals or groups. Allocation is commonly a numerical quota or harvest control rule for a specific gear, fishery sector, geographic area, use, or vessel category but may arise from any other type of management measure. Most fishery management measures allocate fishery resources to some degree because they differentially affect access to the resource by different fishery sectors. Allocation impacts that are not intentional are considered to be indirect or unintentional allocations. Direct allocation occurs when numerical quotas, harvest control rules, or other management measures are established with the specific intent of affecting a particular group's access to the fishery resource. Allocation impacts of all proposed management measures should be analyzed and discussed in the Commission's decision making process.

Size Limits

Size limits are used to prevent the harvest of a particular size of fish. Size limits often protect small fish which are immature or have not reached full reproductive capacity, whereas large fish may be protected due to overall importance to reproduction. Size limits can be applied to all fisheries, but are generally used where fish are handled individually or in small groups such as hook and line or recreational-caught fish. Size limits lose their utility when the survival of fish returned to the sea is low.

Mesh Size

Restrictions on the mesh size used in nets or traps are a common management measure. By increasing or decreasing mesh size, it is possible, to a limited degree, to increase or decrease the size of fish retained in the net. Control over the size at entry

into the fishery can ensure that sufficient numbers of immature fish pass through the gear to protect the long-term productivity of the resource. Mesh size also can be adjusted to maximize the yield of certain species.

Bag Limits

Methods for controlling recreational fishing include, but are not limited to, bag limits, which limit the catch per individual over a set time period. Bag limits are often set on a daily basis. The intended effect of bag limits is to restrict the overall catch, to spread the available catch over a large number of anglers, and to avoid waste. Punch cards are a type of bag limit whereby cards are issued and punched for catch and possession of one or more fish, usually over a longer period of time. Punch cards can be used as a reporting system to monitor and restrict catch in the recreational fishery.

Effort Controls

Effort limitation includes almost all measures to restrict or reduce fishing activities. Limited entry programs restrict the total number of permitted fishing licenses or vessels; individual transferable quotas limit the catch allowed per license or individual as well as the number of individuals who participate. The total number of participants in the white seabass recreational fishery has never been limited by regulation. However, the Commission may determine that management of the fisheries requires some form of effort limitation in order to achieve the objectives of the WSFMP.

Controls on Fishing Gear

Other forms of control include but are not limited to restrictions on the number of units of gear or restrictions on the type and size of nets, number of hooks, number of poles, size of vessels, or escape panels and ports.

The use of fishing gear for the commercial harvest of white seabass is authorized pursuant to statutes enacted by the Legislature and regulations adopted by the Commission. Implementation and modification of specific management measures regarding gear, such as definitions of legal gear, mesh size restrictions, gear marking, escape panels and ports, and the length of time gear may be left unattended, or other gear restrictions are authorized by this FMP. Gear restrictions specific to white seabass fisheries may be established, modified, or removed under the points of concern process. Any changes in gear regulations should be scheduled so as to minimize costs to the fishing industry.

There are restrictions on legal recreational gear; existing state regulations apply and may be modified under the points of concern process as appropriate to accomplish the WSFMP goals. Gear restrictions may be established, modified, or removed under the points of concern process. Any changes in gear regulations should be scheduled so as to minimize costs to recreational fishermen.

Reporting and Observer Programs

Data reporting and on-board observer programs are used to collect detailed data required in some circumstances. This WSFMP authorizes development of data reporting and observer programs as determined necessary by the Commission. The WSFMP intends that any special requirement be imposed only if it is expected to enhance the ability to accurately monitor the various components of the white seabass fishery, including but not limited to catch, incidental catch of non-target fish, interactions with birds, pinnipeds, or sea turtles, and effectiveness of historical or newly enacted regulations.

Vessel operators may be required to maintain and submit logbooks at specified intervals, which contain accurate information including the following: daily and cumulative catch by species, effort, processing, and transfer information; crew size; time, position, duration, sea depth, and catch by species of each haul or set; gear information; identification of catcher vessels; information on parties receiving fish or fish products; and any other information deemed necessary.

All fishing vessels engaged in the take of white seabass may also be required to accommodate on-board observers for the purposes of collecting scientific data. An observer program will be considered for the circumstances where other data collection methods are deemed ineffective for management of the fishery. Specifications for any observer program shall be developed in cooperation and consultation with the operators of the fishing vessels under consideration.

Fees and Permits

California has laws concerning commercial and recreational licenses, permits, and fees. Nothing in this FMP is intended to exclude the use of additional fees or permits in the future as long as the fee or permit is consistent with applicable law, management measures and the intent of the WSFMP.

Vessel Identification

The WSFMP authorizes the use of vessel identification requirements, which may be modified as necessary to facilitate vessel recognition and enforcement.

5.2 Definition of Maximum Sustainable Yield and Optimum Yield

Maximum sustainable yield (MSY) is defined in §96.5 FGC as follows: “Maximum sustainable yield in a marine fishery means the highest average yield over time that does not result in a continuing reduction in stock abundance, taking into account fluctuations in abundance and environmental variability.”

The MSY model determines catch limits, which most often are expressed as a fixed fishing rate such that a constant fraction of the stock may be harvested each year. It is specific for each species or stock of fish, and is calculated from knowledge of abundance, life history, and population dynamics. Environmental factors are also considered since they affect growth, reproduction, and mortality rates. In many cases, providing a range of estimates for MSY may be reasonable since there are different

assumptions in the model. In addition, there may be situations where the scientific information is inadequate to directly calculate MSY for a particular species, and a proxy or substitute may be used. For example, recent average catch may be used as a proxy for MSY if a time period is chosen when there is no evidence of a declining abundance.

Optimum yield (OY) is generally defined as the harvest level for a species, such as white seabass, that achieves the greatest overall benefits when considering biological, social and economic factors. Optimum yield differs from MSY because MSY only considers the biology of the species in question (Wallace et al. 1994).

The Marine Life Management Act provides a definition of OY, which is similar to the generalized definition, but which gives specific direction for resource managers:

“Optimum yield, with regard to a marine fishery, means the amount of fish taken in a fishery that does all of the following: (a) provides the greatest benefit to the people of California, particularly with respect to food production and recreational opportunities, and takes into account the protection of marine ecosystems. (b) is the maximum sustainable yield of the fishery, reduced by relevant economic, social, or ecological factors; (c) In the case of an overfished fishery, provides for rebuilding to a level consistent with producing maximum sustainable yield in the fishery” (§97 FGC).

White seabass management through the use of an OY is consistent with the MLMA and the goals and objectives of the WSFMP. This methodology allows continued utilization of the white seabass resource while the stock is recovering from low abundance and less than optimal oceanic conditions which occurred during the 1960s and 1970s.

It is not uncommon that the status of knowledge for a given stock is limited to the catch history and incomplete life history information. A precautionary approach to calculating OY in data-moderate or data-poor situations is to multiply MSY, or its proxy, by a fraction. A tenet of this principle is that less aggressive (more restrictive) harvest policies are adopted as uncertainty increases concerning the status of stocks and their response to fishing pressure (Restrepo et al. 1998).

5.3 General Fishery Management Plan Framework

An FMP framework is a multi-year management plan that describes the processes by which the fishery will be managed, including when, how, and within what limits regulatory changes will be made, and the ranges of the resulting impacts. Preseason and in-season adjustments to regulations may be made without FMP amendment by implementing the procedures and provisions established in the FMP framework. Instead of providing a fixed set of management measures to implement at one point in time, the FMP framework establishes mechanisms to adjust the management of the fishery to meet changing circumstances over a longer time frame. This may be

accomplished through annual adjustments of seasons, quotas, etc., or through in-season adjustments needed in response to factors that cannot be precisely anticipated during a review process. Framework adjustments may be implemented more quickly than FMP amendments, allowing for more timely management response and providing for adaptive management.

Explicit instructions may be built into an FMP framework to lessen the risk that the FMP could be considered capricious. However, guidelines that are too specific could restrict the flexibility and adaptability of fishery management. Included in the FMP framework are limits and controls for how adjustments may be made. The FMP framework must specify fully the processes to be used in making adjustments including the triggering mechanisms, procedures to be followed, and actions to be taken.

5.3.1 Plan Amendment

Framework management for FMPs is designed to be flexible and adaptable to a wide range of future conditions and intended to function without the need for frequent amendment. However, unforeseen social, economic, environmental or biological developments may create an unanticipated situation where the existing FMP does not adequately provide for future management of the fishery. Under such circumstances, the FMP would be amended to allow for efficient and responsive management of the fishery. Fishery management plan amendments are required for major changes or controversial actions, which are outside the scope of the original FMP. Examples of actions that would require an FMP amendment include:

- Changes to management objectives;
- Changes to species in the management unit;
- A change in the definition of an overfished stock;
- Amendments to any procedures required by the FMP; or
- Revisions to any management measures that are fixed in the FMP.

An FMP amendment entails an extensive development and adoption process including input from advisory committees, public hearings, and an extended period for public comment and peer review. In addition, amendment of an FMP requires CEQA analysis of the proposed changes to the document. Once a draft plan amendment is completed, it will have to undergo the full rule-making process described in the next Section.

5.3.2 Framework Actions

There are three different categories of management actions, each of which requires a slightly different process. Management measures may be established, adjusted or removed using any of the following three procedures:

A. Full Rule Making Actions (Regulatory Amendment)

These include any proposed management measure that is highly controversial or any

measure which directly allocates the resource. The Commission normally will follow the three-meeting procedure, which means the identification of issues and the development of proposals will begin at a Commission meeting prior to the first decision meeting. Subsequent to this meeting there will be two decision meetings, the first meeting to develop proposed management measures and their alternatives, the second meeting to make a final decision.

Management measures recommended to address a resource conservation issue must be based upon the establishment of a point of concern and consistent with the specific procedures and criteria listed in Section 5.4.1. Management measures recommended to address social or economic issues must be consistent with the specific procedures and criteria described in Section 5.4.2.

B. "Notice" Actions

These include all management actions other than prescribed actions that are either non-discretionary or have probable impacts that have been previously analyzed. The Commission will require at least one Commission meeting to approve routine management measures.

These actions are intended to have temporary effect and the expectation is that they will need frequent adjustment. They may be recommended at a single Commission meeting, although the Commission will provide as much advance information to the public as possible concerning the issues it will be considering. The primary examples are management actions defined as routine in Section 5.3.3. These include trip landing and frequency limits for all gear types and recreational bag limits. Previous analysis must have been specific as to gear type before a management measure can be defined as routine and acted upon at a single Commission meeting.

C. Prescribed Actions

Prescribed management actions may be initiated by the Department Director or Commission without prior public notice, opportunity to comment, or a Commission meeting. These actions are ministerial and the impacts must have previously been taken into account. Examples include fishery, season, or gear type closures when a quota is attained.

5.3.3 Routine Management Measures

Routine management measures are those that the Commission determines are likely to be adjusted on an annual or more frequent basis. Measures are classified as routine by the Commission through either the full or abbreviated rule making process. In order for a measure to be classified as routine, the Commission will determine that the measure is of the type normally used to address the issue at hand and may require further adjustment to achieve its purpose with accuracy.

As in the case of all proposed management measures, prior to initial implementation as

routine measures, the Commission will analyze the need for the measures, their impacts, and the rationale for their use. Once a management measure has been classified as routine through one of the two rule making procedures outlined above, it may be modified thereafter through the single meeting notice procedure if: (1) the modification is proposed for the same purpose as the original measure, and (2) the impacts of the modification are within the scope of the impacts analyzed when the measure was originally classified as routine. The analysis of impacts need not be repeated when the measure is subsequently modified if the Commission determines that they do not differ substantially from those contained in the original analysis. The Commission may also recommend removing a routine classification.

5.4 White Seabass FMP Framework

The FMP framework for white seabass resource management is composed of several elements, which taken individually or together, will allow the Commission to react quickly to changes in the white seabass population off California without the need for a full amendment. Management measures are normally imposed, adjusted, or removed at the beginning of the fishing year but may, if the Commission deems necessary, be imposed, adjusted, or removed at any time during the year. Management measures may be imposed for resource conservation, social or economic reasons consistent with the criteria, procedures, goals, and objectives set forth in the WSFMP.

The WSFMP framework consists of a points of concern process, socioeconomic process, allocation criteria, and harvest control rules, which give the Commission specific guidelines for making management decisions. However, these guidelines are intended to be flexible and allow for other management strategies that would effectively achieve the goals and objectives of this FMP and MLMA.

5.4.1 Points of Concern Process

The points of concern process is one of the tools the Commission has for exercising its resource stewardship responsibilities for white seabass. The process is intended to foster a continuous and vigilant review of the white seabass stocks and fisheries to prevent overfishing or other resource damage. To facilitate this process, a Department White Seabass Management Team (WSMT) will be created to monitor the fisheries throughout the year, taking into account any new information on the status of each species or species group to determine whether a resource conservation issue exists that requires a management response. The points of concern criteria are intended to assist the Commission in determining when a focused review on a particular species is warranted, and which may result in the need to recommend management measures to address the issue.

This FMP framework provides the authority to act based solely on the points of concern. Thus, the Commission may act quickly and directly to address a resource conservation issue. In conducting this review, the WSMT will utilize the most current catch, effort, abundance and other relevant data.

In the course of the continuing review, a “point of concern” occurs when any one or more of the following is found or expected:

- Catch is projected to significantly exceed the current harvest control rule or quota;
- Any adverse or significant change in the biological characteristics of the white seabass stock (age composition, size composition, age at maturity, or recruitment) is discovered;
- An overfished condition exists or is imminent;
- Any adverse or significant change in the availability of white seabass forage or in the status of a dependent species is discovered;
- An error in data or a stock assessment is detected that significantly changes estimates of impacts due to current management.

Once a point of concern is identified, the WSMT will evaluate current data to determine if a resource conservation issue exists and will provide its findings in writing at the next scheduled Commission meeting. If the WSMT determines a resource conservation issue exists, it will provide its recommendation, rationale, and analysis for the appropriate management measures that will address the issue. In developing its recommendation for management action, the WSMT will recommend alternatives from one or more of the most commonly used management measures listed in Section 5.1, or other necessary measures, to address resource conservation issues.

Direct allocation of the resource between different segments of the fisheries is, in most cases, not the preferred response to a resource conservation issue. Commission recommendations to directly allocate the resource will be developed, if needed, according to the socioeconomic process and criteria described in Sections 5.4.2 and 5.4.3.

After receiving the WSMT’s report, the Commission will take public testimony and, if appropriate, will implement management measures accompanied by supporting rationale and analysis of impacts. The Commission’s analysis will include a description of (a) how the action will address the resource conservation issue consistent with the objectives of the WFSMP; (b) likely impacts on other management measures and other fisheries; and (c) economic impacts, particularly the cost to the commercial and recreational segments of the fishing industry. Nothing in this Section prevents the Director from exercising the authority to take emergency action as specified in the Fish and Game Code.

5.4.2 Socioeconomic Process

From time to time, non-biological issues may arise which may require the Commission to consider management actions to address certain social or economic conditions in the fisheries. Resource allocation, seasons, or landing limits based on market quality and timing, safety measures, and prevention of gear conflicts are only a few examples

of possible management issues with a social or economic basis. In general, there may be any number of situations where the Commission determines that management measures are necessary to achieve the stated social and/or economic objectives of the WSFMP.

Either on its own initiative or by request, the Commission may evaluate current information and issues to determine if social or economic factors warrant imposition of management measures to achieve the Commission's established management objectives. Actions that are permitted under this FMP framework include all of the categories of actions authorized under the points of concern FMP framework with the addition of direct resource allocation and access limitation measures.

If the Commission concludes that a management action is necessary to address a social or economic issue, it or the WSMT will prepare a report containing the rationale in support of that conclusion. The report will include the proposed management measure, a description of other viable alternatives considered, and an analysis that addresses the following criteria: (a) how the action is expected to promote achievement of the goals and objectives of the WSFMP; (b) likely impacts on other management measures and other fisheries; (c) biological impacts; (d) economic impacts, particularly the cost to the fishing industry; and (e) how the action is expected to accomplish at least one of the following:

- Enable a quota, harvest control rule, or allocation to be achieved;
- Avoid exceeding a quota, harvest control rule, or allocation;
- Increase sustainable landings;
- Reduce discards;
- Reduce gear conflicts, or conflicts between competing user groups;
- Extend fishing and marketing opportunities as long as practicable during the fishing year;
- Maintain or improve product volume and flow to the consumer or user;
- Increase economic yield;
- Maintain or improve the safety of fishing operations;
- Increase fishing efficiency;
- Maintain or improve product quality;
- Maintain or improve the recreational fishery;
- Maintain or improve data collection, including means for verification;
- Maintain or improve monitoring and enforcement; or
- Any other measurable benefit to the fishery.

The Commission, following review of the report, supporting data, public comment and other relevant information, may implement management measures accompanied by relevant background data, information and public comment. The action will explain the urgency, if any, in implementation of the measure(s).

If conditions warrant, the Commission may designate a management measure as a routine management measure to address social and economic issues provided that the

criteria and procedures in Section 5.4.2 are followed.

Harvest control rules and quotas, including allocations, implemented through this FMP framework will be set annually and may only be modified in season to reflect technical corrections. In contrast, harvest control rules and quotas may be imposed at any time of year for resource conservation reasons under the points of concern mechanism. Nothing in this FMP framework chapter is intended to preclude or limit the Commission's access to the socioeconomic process.

5.4.3 Allocation Criteria

In addition to the requirements described in Section 5.4.2, the Commission will consider at least the following factors when considering direct allocation of the resource:

- Present participation in and dependence on the fisheries, including alternative fisheries;
- Historical fishing practices in, and historical dependence on, the fisheries;
- The economics of the fisheries;
- Any existing agreement or negotiated settlement between the affected participants in the fisheries;
- Potential biological impacts on any species affected by the allocation;
- Consistency with the goals and objectives of this WSFMP and the MLMA.

These criteria are in keeping with the goals of and objectives of the MLMA and as specifically outlined in §7072 (c) FGC: "To the extent that conservation and management measures in a fishery management plan either increase or restrict the overall harvest of a fishery, fishery management plans shall allocate those increases or restrictions fairly among recreational and commercial sectors participating in the fishery." §7086 (c) (2) FGC says that in the case of a fishery determined to be overfished, restrictions and recovery benefits will be allocated fairly and equitably among sectors of the fishery.

Management tools such as catch quotas, seasons, area closures, bag limits, and other regulations can be used to directly or indirectly allocate fishery resources with the intent to increase or restrict a group's access or harvest of a resource. Decisions on allocation and the tools needed to implement those decisions must take into consideration complex biological, social, and economic factors. In addition, modification of a direct allocation cannot be designated as "routine" unless the specific criteria for the modification have been established in the regulations.

5.4.4 Harvest Control Rules

Harvest control rules provide a mechanism to achieve sustainable use, prevent overfishing, and rebuild depressed stocks, each of which are described in the MLMA as primary conservation standards for fisheries management. Harvest control rules based on objective, measurable criteria provide assurance that conservation objectives will be met.

Harvest control rules usually determine target levels and upper limits for take. Input information such as stock size or reproductive potential is necessary to directly calculate allowable fishing mortality, but proxies may be used in situations where direct calculations are not possible due to inadequate data. Typically, an upper limit on fishing mortality or maximum fishing mortality threshold (MFMT) and a lower boundary on stock size or minimum stock size threshold (MSST) are set.

Harvest control rules are incorporated into prearranged plans that use information on stocks to make management decisions so the stock remains within safe biological limits. The rules include plans for decision making and procedures for invoking preset measures to manage the fishery. Objective and measurable stock status criteria, such as MFMT and MSST, must be specified in an FMP using harvest control rules.

In general, harvest control rules involve methods that are used to determine allowable fishing mortality each year. Often, formulas are given in FMPs that provide for direct calculation of the allowable harvest by using the current stock size, stock productivity, and other factors as inputs. However, in practice there are usually gaps in the current state of knowledge for individual species. Since it is common that the requisite data are not sufficiently known to directly calculate MSY or OY, defaults are sometimes specified in FMPs to allow use of the MSY/OY approach. In addition, increased risk resulting from such uncertainty is addressed with the precautionary principle, which establishes less aggressive harvest policies in response to greater uncertainty concerning the status of the stocks and their response to fishing pressure.

The MSY/OY control rule means a harvest strategy which would be expected to result in a long-term average catch approximating MSY as modified by environmental and socioeconomic factors. The MLMA does not require that sustainability and other conservation measures be achieved through MSY and OY control rules. However, alternatives to MSY and OY need objective standards for determining whether or not management measures are accomplishing the intended results.

As data become available, improved, or are updated, the formulas and procedures for setting OY, harvest guidelines, and quotas for white seabass may need to be modified. Changes and additions to these formulas are authorized by the WSFMP and may be accomplished through the points of concern process or the socioeconomic process.

5.5 Trigger Mechanisms

It is vital to have ways that measure or gauge the success of the management measures implemented by the Commission. Measurable long term fishery-dependent and fishery-independent data such as catch trends, recruitment patterns, and forage abundance indices should be used to monitor the effectiveness of current management measures. For example, sustained decreases in catch and or recruitment will alert the WSMT and WSSCAP to potential problems within white seabass stocks. The WSMT and WSSCAP will determine appropriate trigger mechanisms for the white seabass stocks and they will use them to provide management recommendations to the Commission. In turn, the Commission could implement needed management measures in a timely manner through the points of concern process.

On a continuous basis, the WSMT will review landings for which harvest control rules, quotas or specific routine management measures have been implemented, and it will make projections of the landings at various times throughout the year. If it becomes apparent that the rate of landing is substantially different than anticipated and that the current routine management measures will not achieve the management objectives, then the WSMT may recommend to the Commission in-season adjustments to those measures. Such adjustments may be implemented through the single meeting notice procedure.

5.6 Management Alternatives

In addition to the framework procedures described above, initial management alternatives are proposed for implementation upon approval of the WSFMP. If adopted by the Commission and implemented by the Department, these alternatives would become regulations affecting fisheries for white seabass. They may be modified in the future, or new regulations may be implemented, using the framework procedures in the WSFMP. Analysis of these alternatives is deferred to Chapter 6.

As mentioned in 5.1, there are many potential measures to be used in the management of white seabass, and in fact, several of those measures are currently in place (Table 4-1; Appendix B and C). The Department and WSSCAP felt that additional measures were needed to ensure the sustainability of the white seabass resource. In developing these alternatives, an MSY/OY control rule was decided upon to represent the best approach. The reasons for this are that an MSY/OY control rule: 1) contains measurable criteria for use in management decisions; 2) requires calculations using data that the Department currently collects (commercial landings, recreational catch, and fishing effort); 3) can be linked to future research and data needs; and 4) is similar to the approach taken for the management of the nearshore finfish fishery (nearshore FMP).

The data used to develop the alternatives consist of commercial landing receipt data and Commercial Passenger Fishing Vessel (CPFV) logbook data collected by the Department in combination with Marine Recreational Fishing Statistics Survey (MRFSS) data (RecFIN 2001) for private/rental boats and all shore-based fishing

modes (e.g., piers, beaches). Since recreational data are presented in numbers of fish, the numbers were converted to pounds using MRFSS averaged annual white seabass weights by fishing mode. All discussions presented in this chapter are based on weight.

Harvest control rules often address allocation when more than one user group is involved. The WSSCAP, however, decided that allocation of the resource was not an issue at this time. As a group, they reached consensus on sharing the resource without the need for separate allotments and advised the Department to pursue a course of maintaining status quo; however, the panel felt that this issue should be addressed in the next few years. To guide any future discussions of allocation, the advisory panel will use the allocation criteria identified in Section 5.4.3, and any allocation policies that the Commission may develop.

The alternatives below (except A) represent different determinations of MSY/OY to be used in a harvest control rule. It is recognized that these alternatives represent only the upper target reference points and much needed data are required to determine MSST and the shape of the control rule. Once stock assessments are done and knowledge of the white seabass stock moves from data-poor toward data-rich, a better defined MSY control rule can be set. In the interim, it is suggested that the default MSY/OY control rule below (Section 5.7) be used in conjunction with one of the following alternatives.

5.6.1 Alternative A - Status Quo

This alternative provides no changes to present management of white seabass. The management of white seabass would continue through a combination of existing recreational and commercial regulations which include size and bag limits and seasonal closure (See Table 4-1 and Appendix B and C).

5.6.2 Alternative B - OY Proxies Based on National Standard Guidelines

The Magnuson-Stevens Fishery Conservation Management Act uses advisory guidelines, known as National Standard Guidelines (NSGs), to assist in the development of federal FMPs. The NSGs allow for situations where MSY cannot be estimated directly: "If a reliable estimate of pristine stock size (i.e., the long-term average stock size that would be expected in the absence of fishing) is available, a stock size approximately 40 percent of this value may be a reasonable proxy for the MSY stock size, and the product of this stock size and the natural mortality rate may be a reasonable proxy for MSY."

For white seabass, the pre-exploitation biomass was estimated at 40 million pounds, ranging from 30 to 56 million pounds (Dayton and MacCall 1992). Estimates of natural mortality rate (M) from recreational and commercial data range from 0.08 to 0.13 (MacCall et al. 1976; Dayton and MacCall 1992). Using an intermediate value for

natural mortality (0.10), the following calculations can be made:

MSY stock size = Pristine stock size (40 million pounds) x 0.40 = 16 million pounds

MSY proxy = MSY stock size (16 million pounds) x natural mortality (0.1) = 1.6 million pounds

This MSY proxy was then used for alternatives B1 and B2 below.

5.6.2.1 Alternative B1: OY=0.8125 x MSY

Under the MLMA, if management is based on an MSY then an OY must be calculated. Thus, a further step is needed that reduces the above MSY proxy to a level where the chances of overfishing are greatly reduced. Although technical guidelines suggest an upper target reference point at 75% of MSY (Restrepo et al. 1998), the advisory panel advocated an even higher percentage. Based on recent increased catches of juveniles, increased landings, and more individuals seen and caught in northern California (Monterey), the advisory panel reached consensus on an OY of 0.8125 x MSY. This value is 1.3 million pounds (0.8125 x 1.6 million pounds).

5.6.2.2 Alternative B2 (Preferred): OY=0.75 x MSY

This alternative is similar to alternative B1, except there is no deviation from the technical guidelines outlined in Restrepo et al. (1998). A target reference point of 75% of MSY is used to represent OY. This value is 1.2 million pounds (0.75 x 1.6 million pounds).

5.6.3 Alternative C - OY Proxies Based on Recent Catch Levels

This alternative is based on the use of recent catch data as a proxy for MSY, with precautionary adjustments made for OY. The Pacific Fishery Management Council (PFMC) and Commission have adopted recent catch as a proxy for MSY for management of several nearshore finfish species. The PFMC also recognized that a precautionary adjustment of 0.75 x MSY should be used to determine OY in situations when moderate information exists for a particular species. Using this approach, care must be taken to select a period representing recent catch when the stock was not presumed in decline.

For white seabass, MSY estimates were developed based on catch levels for the following number of years and time frames: 5 years (1996-2000), 10 years (1988-1989 and 1993-2000), and 15 years (1983-1989 and 1993-2000). The same calculations were done for the alternatives C1, C2, and C3: the U.S. recreational and commercial catch for the specified time frame was averaged, giving an estimate of MSY. This number was then multiplied by 0.75 to give an estimate of OY.

5.6.3.1 Alternative C1: Based on 1996-2000 Catch Data

In this alternative, the years 1996 through 2000 were selected because they represent the years following the implementation of the nearshore gill net ban. The average catch during this time period was 453,032 pounds; the OY is 339,774 pounds (453,032 pounds x 0.75).

5.6.3.2 Alternative C2: Based on 1988-1989 and 1993-2000 Catch Data

In this alternative, the years 1988 through 1989 and the years 1993 through 2000 were selected because they represent a period of time prior to the nearshore gill net ban, which reduced commercial fishing effort on the white seabass resource in California. This time period also contained several El Niño/Southern Oscillations and the years following these events. There was insufficient recreational data available to use the years 1990 through 1992 because the MRFSS program was not funded in those years. The average catch during this time period was 330,270 pounds; the OY is 247,702 pounds (330,270 pounds x 0.75).

5.6.3.3 Alternative C3: Based on 1983-1989 and 1993-2000 Catch Data

This alternative spanned the 15-year period from 1983 through 1989 and 1993 through 2000. These years were selected for the same reasons as described above. In addition, more years were included to balance fluctuations in catches due to sensitivity of white seabass to environmental conditions. The average catch during this time period was 283,979 pounds; the OY is 212,985 pounds (283,979 pounds x 0.75).

5.6.4 Alternative D - OY Proxy Based on 1947-1957 Catch Data

Similar to Alternative C, this alternative used catch data as a proxy for MSY, then reduced this number as a precautionary adjustment for OY. The time frame 1947 through 1957 was selected because it occurred during a relatively long period of stability from 1939 to 1960 when total catches were near or above 1 million pounds annually. During this period, the majority of the catch was taken commercially under a 28 inch size limit; recreational fishermen were allowed 5 undersized fish (less than 28 inches) within the bag limit. The time frame was narrowed to avoid any biases due to the advent of World War II and the ban of purse seine gear to take white seabass in 1940. All catches in Mexican waters were not included. Calculations used to determine MSY and OY were the same used for Alternative C above. The average catch during this time period was 1,140,712 pounds; the OY is 855,534 pounds (1,140,712 pounds x 0.75).

All of the proposed alternatives are summarized in Table 5-1.

Table 5-1. Proposed alternatives (harvest control rules) for management of the white seabass resource

<u>Alternative</u>	<u>OY (pounds)</u>
Alternative A: Status quo	N/A
<u>Alternative B</u> : OY proxies based on National Standard Guidelines (NSGs)	
B1: OY=0.8125 x MSY (based on NSGs)	1,300,000
B2: OY=0.75 x MSY (based on NSGs)-Preferred	1,200,000
<u>Alternative C</u> : OY proxies based on recent catch levels	
C1: OY=0.75 x MSY (based on 1996-2000 catch)	339,774
C2: OY=0.75 x MSY (based on 1988-1989 and 1993-2000 catch)	247,702
C3: OY=0.75 x MSY (based on 1983-1989 and 1993-2000 catch)	212,985
Alternative D: OY proxy=0.75x MSY (based on 1947-1957 catch)	855,534

5.7 Default MSY/OY Control Rule

Prior to establishing MSY and OY for white seabass, it is necessary to determine the status of scientific knowledge for the stock. Stocks are generally classified as data-rich, data-moderate, or data-poor (Restrepo et al. 1998):

Data-rich

These stocks have been formally assessed and the current stock size and MSY quantities can be reliably estimated. All critical life history parameters (e.g., growth) are known and the uncertainty in stock assessments is well-defined.

Data-moderate

These stocks have been partially assessed and the current stock size and critical life history parameters are known, but reliable estimates of MSY quantities are unavailable or of limited use. The uncertainty in stock assessments is reasonably defined and quantified.

Data-poor

These stocks lack information on current stock size and reliable estimates of MSY quantities, although catch estimates and some life history information may be available. The uncertainty in stock assessments is poorly defined, and may be qualitative rather than quantitative.

White seabass stocks are currently data-poor.

In data-rich situations a stock-specific MSY fishing rate is employed if available, and downward adjustments are made for OY. A default MSY/OY control rule (Restrepo et al. 1998) is shown in Figure 5-1. The upper limit on fishing mortality or Maximum Fishing Mortality Threshold (MFMT) equals F_{msy} at higher stock sizes and is reduced proportionately as stock sizes fall slightly below biomass levels associated with MSY (B_{msy}). This facilitates rebuilding of the fishery when stock sizes decrease. As a precautionary measure, the OY target is adjusted downward and equals $0.75 \times F_{msy}$. If F_{oy} is exceeded, overfishing is occurring. If the stock falls below the Minimum Stock Size Threshold (MSST), then the stock is considered overfished. The MSST is constrained to be greater than 50% of B_{msy} , however the precise location of MSST relative to B_{msy} depends upon the life history characteristics of white seabass and the dynamics of the stock. As more data become available, the exact shape of the control rule—how fishing mortality is adjusted as stock sizes increase or decrease—may be changed.

An overfished or depressed stock is defined as a stock that falls below the threshold of 50% B_{msy} or 25% $B_{unfished}$ (i.e., the unfished or pristine biomass). For stocks below their overfished/rebuilding threshold, an interim rebuilding adjustment would be made to OY until a rebuilding plan is developed. Rebuilding times may be influenced by many factors, including the degree to which a stock has declined, the inherent productivity of the stock, and the mean generation time for the stock. In general, rebuilding plans allow for recovery to B_{msy} or its proxy in 10 years or less. In cases where that is not possible due to the biological characteristics of the stock, the allowable time is one generation plus the length of time to recover in the absence of fishing.

For data poor and data moderate situations, technical guidelines recommend a target default OY of 0.75, 0.50, and 0.25 x recent catch (MSY proxy) for stocks believed to be

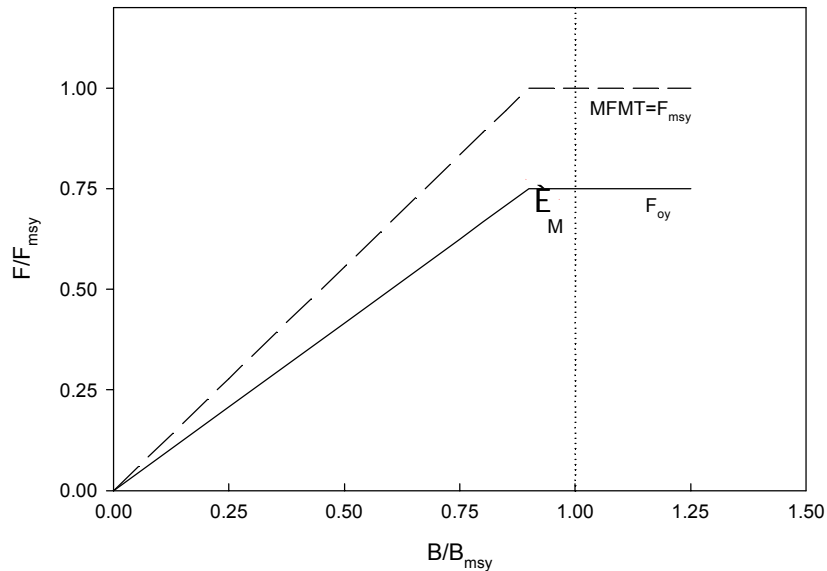


Figure 5-1. Default MSY/OY control rule (modified from Restrepo et al. 1998)

above B_{msy} , below B_{msy} but not overfished, and overfished, respectively (Restrepo et al. 1998). Since quantitative analyses of stock size relative to B_{msy} is often lacking for data poor situations, qualitative approaches may be necessary. For white seabass, there is no current stock size information. Therefore, based on considerable discussion regarding recent landing trends, recruitment, and observations of more white seabass in northern California (Monterey), the WSSCAP reached consensus that the stock size was above B_{msy} .

5.8 Trigger Mechanisms for Proposed Alternatives

In addition to the alternatives, trigger mechanisms have been developed to gauge whether the selected alternative is functioning properly and providing adequate protection for the white seabass resource in the face of changing environmental conditions and consumptive and non-consumptive use. The following trigger mechanisms will be used to monitor the resource and identify when overfishing has occurred and actions are needed:

- The total annual commercial catch of white seabass in pounds landed (from fish receipt data) for two consecutive years declines each year by 20% or greater

from the prior five-year average of landings;

- A 20% decline occurs in the number of fish and average size of fish (round weight) for the same two consecutive years for white seabass caught in the recreational fishery as determined from the best available data;
- Recruitment of juvenile white seabass declines each year by 30% or greater from the prior five-year average of recruitment as determined from the best available data.

Overfishing of the white seabass resource occurs when any one of these conditions are met. If all three of the trigger mechanisms occur, then the white seabass stock is overfished. Evaluation of recreational and commercial take since 1952 indicates that the first two criteria were met eight and nine times, respectively. However, all criteria occurred in both fisheries during the same time period only twice (1960-1969). This indicates that these trigger mechanisms could be sensitive to identifying overfishing, but would not necessarily trigger an overfished condition. The average weight portion of the second and third criteria were not evaluated since there were too few data.

The Department's WSMT and the WSSCAP will further investigate situations leading to the occurrence of any trigger mechanisms, and recommend management measures to the Commission if needed.

5.9 Annual Review of Management Measures

The Commission will review the WSFMP annually. The review will include the most recent fishery-dependent data (e.g., commercial and recreational landings, length frequencies), any fishery-independent data (e.g., recruitment surveys) as well as data on changes that may have occurred within the social and economic structure of the recreational and commercial industries that utilize the white seabass resource within California. Included in this review will also be information about the harvest of white seabass in Mexico, if available, and any other pertinent data. This will permit a review of the proxies for MSY and OY that the Commission may adopt. These reviews will be carried out so that any recommendations or amendments to the WSFMP can be reviewed by the Commission and the public in accordance with the requirements of the MLMA.

5.10 Reporting and Record Keeping Requirements

Catch, effort, biological, and other data necessary for implementation of the WSFMP will continue to be collected by California under existing data collection provisions. If the Commission finds that additional data are needed, it will consult with the WSMT and the WSSCAP to determine the best method for addressing their needs. The implementation of additional reporting requirements will be done in accordance with the annual review process, and following the FMP framework and public input processes

as described earlier.