Chapter 2 Proposed Project Description and Alternatives

2.1 Proposed Project

California's nearshore reef fishes, which are of great economic and intrinsic value to the people of the State, have been subjected to increasing use by a complex network of constituents over the past century. Increased fishing pressure, oceanographic fluctuations, and habitat degradation have resulted in a reduction of the nearshore fish populations. Currently, fishery monitoring and assessment of nearshore fish stocks is inadequate for effective management. Improved and new methods are needed to determine the status of nearshore fish populations in a more timely, specific, and effective manner. This need to create a better nearshore fishery management plan became a legal mandate with the passage of the Marine Life Management Act (MLMA). The goals and objectives of MLMA, and subsequently the are described in Section 1 Chapter 3 and Appendix B which detail how the Department plans to improve nearshore fishery management, along with the ecological, socioeconomic, and legal steps necessary to satisfy the mandates of the MLMA.

The Recommended NFMP Management Project (proposed project) encompasses the entire nearshore shoreline of California, to a depth of 20 fathoms (Figure 2.2-1), and is a conglomerate of different tools that can be used to conserve and manage the nearshore finfish stocks as a public trust resource. They can be used separately or combined, over time and over geographic regions, to meet the NFMP goals and those of the MLMA. The proposed project is a framework for future management, providing the greatest flexibility and the most effective structure for fishery management under data-poor to data-rich scenarios. The Recommended NFMP Management Project incorporates 5 management measures that will be described on the following pages.

1. Fishery Control Rules
2. Regional Management
3. Marine Protected Areas
4. Restricted Access, and
5. Resource Allocation

Fishery Control Rules (or how the total catch is governed) are the primary mechanisms to achieve sustainable use, prevent overfishing, preserve habitat, and rebuild depressed stocks, which are described in MLMA as the primary conservation standards for fisheries management. Fishery control rules based on objective, measurable criteria provide assurance that conservation objectives will be met.

In general, fishery control rules establish key conservation measures and involve methods that are used to determine the allowable fishing mortality (F) each year. Often, formulas are given in FMPs that provide for the direct calculation of the allowable harvest (fishing mortality) by using the current stock size, stock productivity (how fast stocks can be replaced), etc. as inputs. However, there are gaps in the prevailing state
of knowledge for most individual species covered in the FMP. Commonly, the

information required is not available to directly calculate a ceiling for fishing mortality so substitutes may be specified to determine harvest limits. In addition, increased risk,

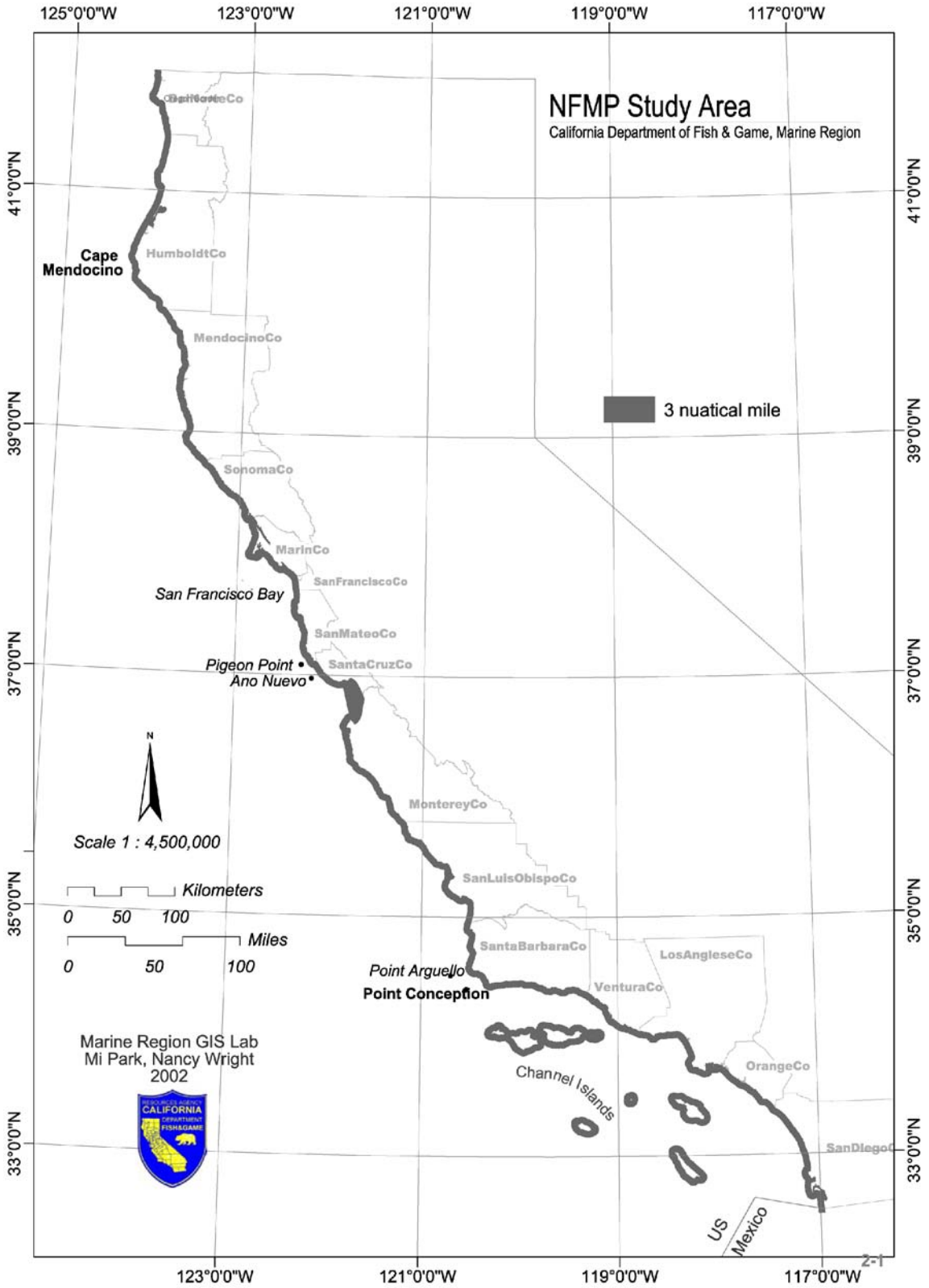


Figure 2.2-1. Proposed Project Site Study Map

resulting from poor knowledge and uncertainty, is addressed by establishing more stringent harvest policies in response to greater uncertainty.

Fishery control rules usually calculate the amount of fish that can be taken and define upper limits on that amount. Input information, such as stock size or reproductive potential, is necessary to directly calculate allowable fishing mortality, but proxies may be used where direct calculations are not possible due to insufficient data. Typically, a lower boundary on stock size and an upper limit on fishing mortality are set. The fishery control rules allow managers to use available data to make decisions so stocks remain within safe biological limits. The rules include a process for decision making and procedures for invoking the preset measures to manage the fishery. One of the most important functions of all fishery control rule approaches is to prevent population collapse by reducing fishing intensity disproportionately when population abundances have declined too low. Restrepo et al. 1998 describes that control rules do not have to be cast in terms of fishing mortality rates or biomass levels, as a control rule seeks to identify measures of "good" and "bad" stock condition (by comparing perceived stock status with biological reference points), as well as the actions that will make the stock condition change from "bad" to "good". Objective and measurable criteria, which define the status of each stock, must be specified in FMPs using fishery control rules.

The NFMP recommended fishery control rule incorporates different approaches in three stages: Stage 1 - data poor circumstances with precaution as the primary basis for setting Total Allowable Catch (TAC), Stage 2 - data moderate circumstances with improved single-species management, and Stage 3 - data rich with ecosystem-based management. TAC means a specified numerical objective for catch including discard mortality. In Stage 1, TAC is equivalent to a proxy, for example, some proportion of historical catches, as only catch history is available. The proxy is a limit placed on catches of all target species that is equal to a reduction by some percentage of the average catch of some series of years when there is no evidence that abundance is declining. The reduction is an application of risk management that provides a reasonable expectation that overfishing will be avoided at the reduced level of catch. The Commission adopted this approach in the interim regulations for cabezon, California sheephead, and greenlings in December 2000. The Pacific Fisheries Management Council (PFMC) adopted this approach to set TACs for its minor rockfish category, which includes the rockfish and California scorpionfish in this FMP.

Regulatory action, such as restrictions in catch, time, area, or gear is triggered when the TAC for any given species or species complex is exceeded within one or more of the nearshore regional management areas. The intent of the fishery regulations is to provide fishery participants an opportunity to achieve the TAC, but not exceed it, and allow as close to a year-round fishery as possible. No rollover of "unused" portions of the TAC should be allowed for Stage 1 fisheries due to uncertainty about population stability and catch sustainability.

Precautionary adjustments to TACs are still necessary in Stage 2 because of minimal information about ecosystem effects of the fishery and the effects of environmental change on the fishery. Stage 2 management incorporates population modeling and other analyses that replace the strictly precautionary approach to TACs in Stage 1. The calculation of MSY assumes equilibrium population dynamics while the

NFMP approach does not. The NFMP employs the term unfished biomass ($B_{unfished}$) and TAC instead of OY. $B_{unfished}$ is defined as the estimate of biomass or stock size that would exist if there had been no fishing in recent history (within several generations of the relevant species). Based on the estimated $B_{unfished}$, a TAC would be calculated for each stock, including downward adjustments made for social, economic, or ecological factors, or if abundance is determined to be lower than the level that would achieve 0.5 $B_{unfished}$. In cases where the status of the stock is known but $B_{unfished}$ may not be directly calculated because of difficulty in determining a spawner recruit relation or other parameters, the default rate $F_{50\%}$ for NFMP finfish would be the fishing rate that reduces the average recruits per spawner to 50 percent of the unfished level (0.5 $B_{unfished}$). An overfished stock is defined as a stock that falls below the threshold of 35 percent of $B_{unfished}$.

The MLMA does not require that sustainability and other conservation measures be achieved only through Maximum Sustainable Yield (MSY) and Optimum Yield (OY) control rules [FGC Section 7056(a)]. However, if alternatives to MSY and OY are used, objective standards for determining whether or not management measures are accomplishing the intended results must be described, such as those described in Stage 1. Maximum sustainable yield is defined in the FGC Section 96.5 as 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 upper limits on catch which may be expressed as: 1) a fixed fishing rate such that a constant fraction of the population may be harvested each year, 2) a fixed yield such that fishers may expect consistency in harvest guidelines or quotas over several years, and/or 3) a constant escapement rate such that a particular spawning population size is maintained.

The reliability of estimates for MSY varies with the degree of understanding about the status and dynamics of a fishery. The vehicle for determining the status of a population and estimates of MSY is a stock assessment. MSY is specific for each species or population of fish. Biological information necessary for completing a stock assessment includes: population dynamics, abundance, life history, and environmental factors, with specifics that include age structure of the population, age at first spawning, fecundity, ratio of males to females in the population, natural mortality, fishing mortality, growth rate, spawning behavior, habitats at different life stages, migratory habits, food habits, and estimates of the total number or weight of fish in a population. Little of this information exists for the species in the nearshore fishery. Where key factors are unknown, such as natural mortality rate and recruitment, assumptions must be made that generate uncertainty about the validity of estimates. In fisheries with limited data, fishery-dependent data are sometimes used instead of fishery-independent information. Because of biases inherent in fishery-dependent information, reliance on this approach is appropriate only when fishery-independent information is limited as in data poor situations.

Optimum yield is defined in FGC Section 97 as the amount of fish taken in a fishery that does all of the following: 1) provides the greatest overall benefit to the people of California, particularly with respect to food production and recreational opportunities, and takes into account the protection of marine ecosystems, 2) is the

maximum sustainable yield of the fishery, reduced by relevant economic, social, or ecological factors, and 3) in the case of an overfished fishery, provides for rebuilding to a level consistent with producing MSY in the fishery. Uncertainty also must be taken into account when setting an OY. As defined, OY can never exceed MSY.

There is often limited knowledge to calculate MSY. Restrepo et al. 1998, provides an alternative approach for federal fisheries management and the State has used a variant of that approach in the interim regulations for the nearshore fishery. In the Restrepo approach, a proxy, or functional equivalent, MSY is calculated when MSY-related parameters can not be estimated from available data, or when their estimated values are deemed to be unreliable. The proxy MSY is based on the historical average catch, selecting a period when there is no indication that abundance is declining. A proxy OY is then determined by multiplying the proxy MSY by a percentage that can vary depending on the amount of information available. As data becomes available and uncertainty decreases about the status of the stocks and their response to fishing pressure, less stringent harvest policies can be adopted. This reduces the chance of inadvertent overfishing when little is known about the status of a stock.

The threshold for shifting to Stage 3 management includes two conditions: 1) the comparison of study areas subject to varied fishing effort, including reference reserves (areas without fishing effort for the 19 species) in each region, and 2) data on the impact of fluctuating climate regime on fishery productivity. For reference reserves to function as intended in Stage 3, it will be necessary to determine that populations within the reserves have reached a level that serve as a reasonable indication of an unfished state under the prevailing environmental conditions. When an assessed stock is believed to be below its target size (0.5 $B_{unfished}$ is not known so the proxy would be 50 percent of estimated unfished productivity as determined from the reference reserves), TAC would be reduced below the $F_{50\%}$ fishing rate. TAC is reduced below $F_{50\%}$ along a straight line between 0.5 $B_{unfished}$ catch (applying $F_{50\%}$ at 0.5 $B_{unfished}$) and zero catch at 10 percent of the unfished biomass (0.1 $B_{unfished}$). This same line would be used as the interim rebuilding plan if a stock falls below its Stage 3 overfished/rebuilding threshold (0.25 $B_{unfished}$). The point at which the line intersects the horizontal axis implies zero catch would be allowed, and is for determining the slope of the TAC line between 0.5 $B_{unfished}$ and 0.1 $B_{unfished}$. An overfished stock is defined as a stock that falls below the Stage 3 threshold of 50 percent of the target biomass or 25 percent $B_{unfished}$.

Regional Management will enhance the ability to tailor management to local conditions and to reduce the risk of regional overfishing or depletion. The proposed project would split the management of the nearshore fishery into three regions, however, additional regions could only be created through an amendment to the NFMP. The commercial and recreational fisheries for nearshore rockfish are currently managed by the PFMC using three adjacent management areas: from the Oregon border to Cape Mendocino, from Cape Mendocino to Point Conception, and from Point Conception to the Mexico border. Point Conception is preferred over Point Arguello because it aligns more closely with the boundary utilized by PFMC.

Marine Protected Areas (MPAs), especially marine reserves where no commercial or recreational take of the 19 species is allowed, are uniquely capable of

eliminating several remaining risks to the sustainability of fishing and to conserve ecosystems and their habitat. The NFMP recommends the creation of MPAs on at least a modest scale to provide several benefits. Non-fishery management benefits include basic levels of ecosystem conservation and consideration for non-consumptive uses (both mandates of MLMA).

Fishery management benefits of the MPAs include a buffer against management mistakes, full protection for some fraction of target and bycatch populations, and increased reproductive potential due to the restoration of more natural age structures. Within MPAs, fish populations have been found generally to be denser and more diverse than in fished areas. MPAs should provide a buffer against overfishing, and if a population is determined to be depressed, the rebuilding process would be enhanced. MPAs may enhance fishery yields outside their borders over time. In 2001, the National Research Council (NRC) of the National Academy of Sciences published an exhaustive review of MPAs generally and marine reserves specifically (NRC 2001). The NRC found that marine reserves can address one or more of the following fisheries management objectives: 1) allow depleted fisheries to recover from overfishing, with the most dramatic recovery occurring within the boundaries of a reserve, 2) prevent the collapse of fish stocks, especially if key fishery habitat is included within the boundaries, 3) improve sustainable yield of fisheries, through spill-over of juveniles and adults from reserves into fishing grounds and perhaps through dispersal of larvae into fished areas if networks of reserves are properly designed, 4) reduce bycatch of non-targeted species and undersized individuals of target species, 5) provide an effective mechanism to ensure against overfishing of some species if exploitation is high and there is substantial uncertainty in stock assessments (both conditions exist in the nearshore finfish fishery), 6) and particularly, in the case of relatively sedentary fish such as nearshore finfish, protect a portion of populations from errors in assessing risk and from environmental fluctuations.

The NFMP proposes a substantial role for MPAs as part of a comprehensive plan to manage the nearshore fishery. However, rather than establishing MPAs itself, the NFMP defers to the process under the authority of the Marine Life Protection Act of 1999, except for the establishment of MPAs around the Channel Islands. Those MPAs are being developed with another process coordinated between the Channel Island National Marine Sanctuary and the Department of Fish and Game.

Restricted Access programs in fisheries limit the quantity of persons, vessels or fishing gear that may be engaged in the take of any given species of fish or shellfish. Restricted Access may limit the catch allocated to each fishery participant through harvest rights such as individual or community quotas. They attempt to balance the fishing capacity of the commercial fleet with the size of the resource in a way that results in an economically viable and sustainable fishery. The Commission adopted the Department's recommendation to base catch limits for rock greenlings, kelp greenlings, cabezon and California sheephead on recent average catches reduced by 50 percent as a precautionary measure. The OYs set by the Commission and PFMC represent the allowable catches with which the fleet capacity must be matched in setting a capacity goal. The Restricted Access component of the recommended project includes a tiered

Restricted Access program (also presented as Alternative 8) and individual fishing shares (also presented as Alternative 12).

The establishment of a Restricted Access program is one of the regulatory measures that the Commission may apply to the nearshore finfish fishery. Initially, the development of a Restricted Access program for the 10 species identified in the MLMA at Fish and Game Code Section 8588 would be proposed. Of these 10 species, the five rockfish species and the California scorpionfish are actively managed by the PFMC, which has placed caps on catches in the last several years. The 10 species also include cabezon and kelp greenling, which are included in the federal fishery management plan for the Pacific Coast groundfish, but not actively managed. Cabezon and kelp greenling, as well as California sheephead and rock greenling, are four species subject to regulation by the Commission, which set limits on commercial and recreational catches beginning in 2001. The Recommended NFMP Project does not propose restricting access for the recreational fishery.

The Commission adopted a Restricted Access policy for commercial fisheries in order to guide future programs. The Commission believes that Restricted Access programs can offer at least four benefits: 1) fostering sustainable fisheries by offering a means to match the level of fishing with the capacity of a fish population and by giving fishers a greater stake in maintaining sustainability, 2) providing a way to fund total costs for administration and enforcement of those programs, 3) providing long-term social and economic benefits to the State and fishers, and 4) broadening opportunities for the commercial fishing industry to contribute to management of the State's commercial fisheries (Leet et al. 2001).

Resource Allocation is the assignment of a predetermined amount of nearshore fish for recreational and commercial extractive uses. One of the most difficult and controversial aspects of management in many fisheries is the allocation of allowable catches between commercial and recreational fishers or between gear types. The NFMP addresses the allocation of nearshore finfish assuring that fisheries and resources are sustainable ecologically and economically. Management tools such as catch quotas, seasons, area closures, bag limits, and other regulations can be used to allocate fishery resources, directly or indirectly, with the intent to increase or restrict a group's access or harvest of a resource.

In December 2000, the Commission allocated cabezon, California sheephead, kelp greenlings and rock greenlings based on historical take, specifically on the ratio of commercial and recreational catches during the combined period 1983 to 1989 and 1993 to 1999. The Department recommended, and the Commission adopted management restrictions, including size limits, seasonal and area closures for commercial and recreational fishers, and weekday closures for the commercial sector, in order to restrain catches within the adopted limits.

Currently, the State adopts management measures and restrictions that are consistent with the PFMC's distribution of the OY it sets for nearshore rockfish south of Cape Mendocino. In setting its allowable take, the PFMC estimates anticipated recreational catches in the coming year, based on current regulations. Upon recommendations of the Department, the Commission adopts regulations for the recreational fishery that are consistent with the PFMC's decision. The PFMC then

subtracts the recreational set aside from the acceptable biological catch in order to determine the commercial set aside which is adjusted upward or downward based on the state of the stocks. The PFMC adopts commercial regulatory measures, such as trip limits, as needed.

The Recommended NFMP Resource Allocation is based on the use of historical fishery information, applied regionally, with provisions for local decision making processes to determine area separation and species. This builds on the approach utilized by the Commission in its allocation under the interim regulations adopted in December 2000. In 2000, the Department proposed to the Commission that harvest levels of nearshore species under State management be based on an average of recent catches reduced by 50 percent as a precautionary measure in response to uncertainty about the status of the stocks and the data-poor situation of these nearshore fisheries. The Recommended NFMP Resource Allocation will apply the same general principle of using historical landings as a guide by making two major changes. First, calculation of historical landing will be conducted after a careful review of commercial and recreational landings information to ensure the use of the most accurate information. Second, allocation shares would be calculated by region rather than statewide.

Alternatives

An ED need not consider every conceivable alternative to a project. Rather it must consider a reasonable range of potentially feasible alternatives that will foster informed decision making and public participation. It is not required to consider alternatives which are infeasible. The discussion of alternatives focuses on alternatives to the project, or its location, which are capable of avoiding or substantially lessening any significant effects of the project, even if these alternatives would impede to some degree the attainment of the project objectives, or would be more costly. Of those alternatives, this document examines in detail only the ones that could feasibly attain most of the basic objectives of the project. The document provides information about each alternative to allow meaningful evaluation, analysis, and comparison with the proposed project and does not consider alternatives whose effect cannot be reasonably ascertained and whose implementation is remote and speculative. The following provides a range of alternatives to the proposed project, or its location, that could feasibly accomplish most of the basic objectives of the project and avoid or substantially lessen one or more of the project-related effects.

2.2 Alternative 1 - No Project (continue current regulations)

The purpose of describing and analyzing a no project alternative is to allow decision makers to compare the impacts of approving the proposed project with the impacts of not approving the proposed project. Under this alternative, existing nearshore finfish management practices as used by the Council and, to a degree, by the Commission in 2001 would be adopted. It would depend entirely on an MSY and OY approach for determining annual allowable take of nearshore stocks, with precautionary adjustments to MSY for establishing OY under data-moderate and data-poor conditions.

There would be continued mixed jurisdiction for nearshore stocks, with nearshore rockfish MSY and OY established annually by the Council, and other nearshore species MSY and OY established by the Commission. Although cabezon and kelp greenling are included under the PFMC (Pacific Fishery Management Council 1993), active management for those species has been assumed and would continue by the Commission. Separate MSY and OY calculations are made for aggregate nearshore rockfish north and south of Cape Mendocino, but MSY and OY for other nearshore stocks is statewide (Table 2.2-1).

Table 2.2-1. 2001 Optimum Yield and Allocation for Nearshore Finfish in Metric Tons

Species	OY	Recreational Allocation	Commercial Allocation
Nearshore rockfish[1]	100	70	30
Nearshore rockfish[2]	662	550	112
California sheephead	101	61	40
Cabezon	81	50	31
Kelp and rock greenlings	18	12	6
Total	**962**	**743**	**219**

1 North of Cape Mendocino
2 Cape Mendocino south including California scorpionfish

Prior to establishing MSY and OY for each stock, it is necessary to determine whether the status of scientific knowledge for that stock is data-rich, data-moderate, or data-poor. Data-rich stocks have been formally assessed and the current biomass relative to unfished biomass can be reasonably estimated. There are no data-rich stocks in the nearshore FMP. Data-moderate stocks have been partially assessed, and information on relative changes in biomass over time is generally known. Black rockfish is a data-moderate nearshore stock. Data-poor stocks lack information on changes in biomass over time. Catch estimates and some life history information may be available. Most nearshore stocks are currently data-poor.

In data-poor situations, such as currently exist for nearly all nearshore species, both jurisdictions have adopted recent catch as a proxy for MSY, and a precautionary adjustment of 0.50 x MSY is used to determine OY. Care was taken to select a period to represent recent catch when the stock did not appear to be declining. An aggregate OY has been employed for all nearshore rockfish (including California scorpionfish), but cabezon, greenlings, and California sheephead have individual species OYs. In data-moderate situations, such as in the event of partial assessments or clear evidence of trends in abundance, a precautionary adjustment of 0.75 x MSY is used to determine OY. In data-rich situations, a stock-specific MSY fishing rate is employed if available, and downward adjustments are made to OY if abundance is determined to be lower than the level that would achieve MSY (i.e., B_{msy}, the biomass level associated with MSY) (Figure 2.2-2).

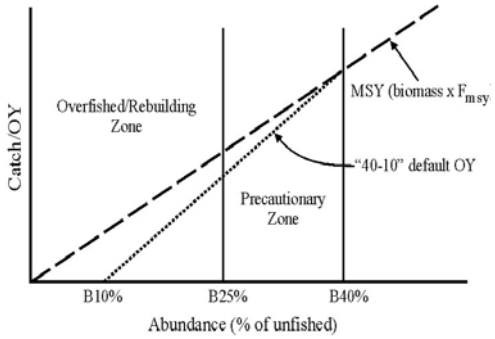
Figure 2.2-2 Nearshore rockfish fishery control rule guidelines.

Maximum sustainable yield is a fixed exploitation rate, where a constant fraction of the stock may be harvested each year. In cases where the status of the stock is known, but MSY may not be directly calculated because of difficulty in determining a spawner recruit relation or other parameters, the default rate is $F_{50\%}$ for rockfish (where $F_{50\%}$ = fishing rate that reduces the average recruits-per-spawner (reproductive potential) to 50 percent of the unfished level), and $F_{45\%}$ for other nearshore groundfish.

When the stock is believed to be below its MSY size (when B_{msy} is not known, the proxy will be 40 percent of estimated unfished productivity), OY will be reduced below the MSY fishing rate. Optimum yield is reduced below MSY along a straight line between MSY catch (e.g., applying $F_{50\%}$ at $B_{40\%}$ where $B_{40\%}$ = 40 percent of the unfished or pristine biomass) and zero catch at 10 percent of the unfished biomass (i.e., $B_{10\%}$). This same line would be used as the interim rebuilding plan if a stock falls below its overfished/rebuilding threshold ($B_{25\%}$). The point at which the line intersects the horizontal axis does not necessarily imply that zero catch would be allowed, but rather is for determining the slope of the line.

An overfished or depressed stock is defined as a stock that falls below the threshold of 50 percent B_{msy} or 25 percent $B_{unfished}$ (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 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.

2.3 Alternative 2 - Fishery Control Rules with Prohibited Take, Possession, Landing, Sale, or Purchase of the 19 NFMP Species Taken From Waters off California While Those Species are Managed Under FCR Stage I and II Conditions



This alternative would combine the Fishery Control Rules (Stage I, II, and III) but prohibit the commercial sale and marketing of the 19 nearshore finfish species, live or dead, as a precautionary measure. The

rational for this precautionary approach is that the commercial take of nearshore finfish may constitute incompatible fishing practices for a sustainable fishery. The extremely high value of premium/live fish allows commercial fishers to continue to exploit local fishing grounds after areas have been fished to unacceptably low levels. This could result in the depletion of fish, from individual fishing grounds, because of the very small individual landings and low catch rates that continue to be profitable. Prohibition of the live or dead sale of the 19 finfish species is necessary to address sustainability concerns that are associated with the commercial nearshore fishery, particularly under existing circumstances with a commercial fleet that is significantly larger than necessary to catch the available TAC. It is unlikely that sufficient information will be available under Stage I and Stage II management conditions to adequately manage the commercial fishery on a coastwide scale. However, sufficient information may be available under Stage III conditions.

2.4 Alternative 3 - Gear Restrictions for Commercial Fleet

This alternative would rely on commercial gear restrictions as a primary management measure to provide an expectation that fisheries would not exceed sustainable levels. Commercial harvesting for nearshore finfish would be limited to the use of rod-and-reel or hand lines with not more than five hooks per line. All lines would be attached directly to the fisher or vessel and free to drift with the vessel. A maximum of two lines per fisher and a combined maximum of four lines per nearshore permitted vessel would be allowed. The overall number of allowed hooks would be a maximum of 20 per vessel and the use of fish traps would be prohibited. Reduced efficiency and lower fishing power for the commercial sector would be expected to help slow or arrest the rate of serial depletion where the commercial fishery accounts for a majority of the overall fishing mortality.

The primary benefit of this alternative would be the immediate and significant reduction in the overall take of nearshore fish. This lowering of the efficiency of commercial fishing gear has the best potential to avoid resource depletion without expensive quota monitoring measures. By attaching lines to a vessel, fish which tend to be attracted and more vulnerable to anchored baits would not be take in as high numbers. Fishing would be limited to those time periods when fishers are actively engaged in fishing. The ability to fish traps or set gear overnight would be eliminated. This would have the added benefit of reducing the potential for gear loss due to bad weather. By reducing the overall number of hooks allowed from the current 150 to a maximum of 20 would reduce the fishing power of each vessel and create a “de facto” refuge in kelp forest areas due to the difficulty of fishing with hand lines in kelp forest areas.

2.5 Alternative 4 - PFMC's Two Nearshore Rockfish Regional Management Areas

Regional management will enhance the ability to tailor fishery management to local conditions and reduce the risk of regional overfishing or depletion. This alternative divides the State into two management areas: the Oregon border to Cape Mendocino

and from Cape Mendocino to the border of Mexico, and aligns state management areas to Council nearshore rockfish management areas.

2.6 Alternative 5 - Four Regional Management Areas: North Coast, North-central Coast, South-central Coast, and South Coast Regional Management Areas

This regional management alternative divides the State into four management areas: 1) North Coast: Oregon border to Cape Mendocino, 2) North-Central Coast: Cape Mendocino to Point Año Nuevo, 3) South-Central Coast: Point Año Nuevo to Point Conception, and 4) South Coast: Point Conception to the border of Mexico. This alternative aligns the Northern Coast and Southern Coast regional management areas to specific major geographic barriers (e.g., Cape Mendocino and Point Conception). It also addresses the differences in the nearshore fishery that are observed along the central California coast (e.g., dominance of cabezon in the landings from the southern part of the central California coast) by dividing the central coast into two management areas. Año Nuevo is the preferred boundary between these two regional management areas because the kelp beds south of Año Nuevo tend to be composed predominately of the giant kelp, while kelp beds to the north are more likely to contain bull kelp, and few fishers from the Monterey port complex fish north of Año Nuevo.

2.7 Alternative 6 - Allocation Percentages Based on Stock Biomass

This allocation alternative would allocate a higher percentage of the optimum yield (OY) to the recreational sector when the stock biomass is low. As stock biomass increases, the allocation for the recreational sector would decrease by an amount proportional to the stock increase, eventually sliding down to a lower percentage when the resource is abundant. The recommended percentages initially, by species or species group, would be 70 percent to the recreational sector and 30 percent to the commercial sector as minimums. If and when the biomass of the species or species groups increases, the OY would increase, and the commercial sector would receive the increased biomass in its allocation, until the allocation ratio for each sector was 50 percent. This alternative would be managed by region and based on the regional stock biomass data.

This would address concerns that recreational allocation, set by tonnage, is not flexible enough to reflect changes in biomass. The recreational sector would be provided with a larger share of the catch when fish are scarce. It would provide the commercial sector a larger share of the catch when fish are more abundant, while still providing the recreational fishers a satisfying experience. This alternative relies on knowledge of stock size and would require extensive data collection to obtain more adequate knowledge.

2.8 Alternative 7 - Allocation Based on an Economic Basis of Benefit to the State

A portion of the allocated resource would be provided to the commercial and recreational sectors based on the economic benefits of each group, overall, to the State and local communities. This concept is dependent on the development, acquisition, and analyses of information that is not currently available. There are two basic ways to allocate the resources among sectors: the allocation between competing user-sectors is

based on a distribution that maximizes the net benefits from the collective use of the fishery resource (net benefit is the resource's maximum economic value to the public, less the resource cost), or the allocation between competing user-sectors is distributed in proportion to the economic contribution of each user-sector to the economy.

An economics-based allocation alternative can ensure efficient use of resources by matching the relative value of the resource to the public's overall economic benefits, and can ensure efficient use of resources. Currently, we lack appropriate economic data for all sectors. Larger shares could go to smaller operations to balance total revenue potential. Nonmarket goods, such as tourism, typically lack price and value information which may be difficult or costly to obtain. Small operators may lose out if they are found to be economically inefficient and one sector might be eliminated to achieve an overall efficient economic solution.

2.9 Alternative 8 - Commercial Restricted Access Programs

Currently, a moratorium exists on issuing permits required to take 9 of the 19 nearshore species. Under this alternative, a formal Restricted Access program would be adopted for the take of these nine species. The Commission's policy on Restricted Access would be used in developing this program. As part of the policy, a capacity goal would be established based on Department and industry input. The capacity goal would be based on promoting resource sustainability and economic viability. Criteria to qualify for a permit would likely be based on historic landings in the fishery, possibly combined with a requirement of participation in the fishery in recent years. The number of years that a fisher participated in the fishery may also be considered. It is possible that many of the current permit holders and fishery participants would not be issued permits under a formal Restricted Access program, depending on the agreed goal for the fishery. The program would seek to adopt means of achieving and maintaining the capacity goal. Extensive public input would be required in the development of a Restricted Access program for the nearshore commercial fishery because of its unique nature (i.e., full- and part-time fishers landing fish in a live or premium condition, using a variety of sizes of fishing vessels, and with different levels of exploitation in different areas of the State). The commercial fishery grew rapidly in the 1990s, but has slowed in the last couple of years. A Restricted Access program could be developed on a statewide or regional basis with possible provisions for a tiered alternative based on participation in the nearshore fishery.

2.10 Alternative 9 - Restricted Access Program Based on Regional Management

The elements of the Restricted Access alternative could be combined with the regional management alternative. With a regional alternative, management measures can be tailored to each area. Most of the nearshore fish species are associated with rocky habitat, and individuals have limited ranges. Because of the territorial nature of some nearshore species, concerns over localized depletion have been raised. Limiting effort, in areas where this can occur, may be necessary. This alternative recognizes differences in the nearshore fishery (e.g., species targeted, gear employed, etc.) from region to region.

The majority of nearshore participants use line or trap gear to target nearshore species, while a few use trawl or gill nets. As part of the Restricted Access alternative, it may become necessary to restrict the gears used. Permittees would receive a gear endorsement based on historical and, perhaps, recent participation. Permits could be given to restrict participation to one or multiple areas. An allocation by species or group of nearshore species would be made for each region. Gear allocations could be considered. Action by the Council would be required to establish separate OYs by geographic region for nearshore rockfish. When the OY has been reached in a particular region, all commercial fishing for nearshore species whose OY has been reached would cease.

The current number of nearshore fishery participants is probably greater than expected to be allowed under the capacity goal that will be developed under a formal Restricted Access program. Therefore, initially, unrestricted transferability (transfer of the permit to another person or vessel) may not be possible.

Monitoring of landings would be necessary to determine when the total allowable harvest for a region is reached. Weekly or daily tallying of landing receipt information would be necessary to track landings. Even with a Restricted Access alternative, it might be necessary to continue to use other management measures, such as time/area closures and gear restrictions, to allow for a year-round fishery that does not exceed its total allowable take.

2.11 Alternative 10 - Restricted Access Program Based on Tiered Management by Nearshore Fishery Participation Level

The nearshore fishery is very diverse, with full- and part-time participants using primarily line (rod and reel, stick gear, etc.) or trap gear from small vessels (15 to 40 feet) and from kayaks and surf boards. To maintain the diversity of the commercial fleet, a tiered alternative could be used in which separate OYs are provided for each tier that is developed. The assumption is that part-time as well as full-time fishers are highly dependent on income derived from the nearshore fishery. This alternative would allow participants in other fisheries the flexibility to supplement their earnings if their primary fishery is not available, or has been affected by environmental or market conditions. Participants could receive a gear endorsement, although there may not be separate allocations for each gear type.

Allocation would be made by region, with each region's allocation divided into allotments for each tier. Full-time participants would receive the larger portion of the region's allocation. Tiers would be based on a fisher's historic participation in all fisheries and specifically the nearshore fishery. It may be necessary to separate tiers by gear types. Qualifying criteria may include a minimum number of landings, total nearshore species landing weight or value, number of years of participation, or a combination with other factors. Because the nearshore fishery has expanded to the north coast only recently, it will be necessary to apply different criteria in some regions. Permittees may qualify for one or multiple permits. Region and gear endorsement would be based on where the fisher made the landings and with what gear.

Initially, transferability may be limited if the number of permits issued exceeds the capacity goal. Transferability could be allowed using a 2-for-1 or 3-for-1 permit retirement within tiers. For example, if a fisher wants to switch tiers, it would be necessary to acquire two (or three) permits in the same tier and region, keep one permit, and permanently retire the other(s). If a fisher wanted to switch regions, it could be allowed depending on the capacity goal and the number of permits already outstanding in that region.

Monitoring of landings would be necessary to determine when the total allowable harvest for a tier or gear is reached. Weekly or daily tallying of landing receipt information would be necessary to track landings.

2.12 Alternative 11 - Restricted Access Using a Commercial Passenger Fishing Vessel (CPFV) Control Date

Currently, CPFVs are required to have a commercial boat registration and a CPFV license. If it should become necessary to restrict the number of vessels participating in this fishery, a control date is the first step. A control date is a cut-off date after which new vessels entering the fishery would not be guaranteed participation in a fishery controlled by a CPFV Restricted Access program alternative.

A date in 2001 would be selected. All vessels purchasing a CPFV license would be affected, regardless of vessel size or passenger limit. The control date would be statewide, although the CPFV fleet could be managed on a regional basis. If a CPFV Restricted Access program alternative is chosen, the Commission's policy on Restricted Access fisheries would be used. If a control date is not established, the number of CPFVs and the overall fishing effort could increase as displaced fishers from other fisheries look for alternative fisheries. Additional CPFVs entering the fishery could negatively affect the economic viability of the existing fleet.

2.13 Alternative 12 - Restricted Access Using a Nearshore Recreational Permit

This alternative would create a recreational permit for nearshore species in the form of a stamp that would be placed on the recreational angler's license in order to retain nearshore species. A fee would be charged for the permit to cover administrative costs. This permit would give the Department an estimate of the number of recreational anglers targeting these species. Once the Department develops a database of recreational anglers, it could be used for directed mailings when holding public meetings, or when regulation changes are proposed or enacted that affect nearshore species.

2.14 Alternative 13 - Managing Bycatch in Other Commercial Fisheries

For the most part, vessels harvesting fish or invertebrate species with gill net or trawl gear are required to fish more than three miles offshore. However, trawling is allowed between Point Arguello and Point Dume in waters father than one nautical mile from the mainland in the California halibut trawl grounds. Some nearshore species are found offshore and are taken by trawl and gill net gears. In this alternative, vessels using gill net or trawl gear would not be issued a nearshore permit. They would be allowed to take the original nine nearshore fish species as long as the weight did not

exceed a set weight or a percentage (5 to 15 percent) of the total landing weight of the participant's catch. A set weight limit is easier for the fishers and Department enforcement staff to monitor. A fixed percentage of the landing weight is more difficult to monitor because of the necessity to know total weight of the landing for all species.

This alternative avoids wastage of the catch of nearshore species by allowing the landing of those species without requiring a nearshore permit. This allows fishers to land nearshore fish without increasing the number of nearshore fishery permits. Allowing the landing of nearshore species would eliminate the need to discard these fish at sea and would provide a record of that take which could be monitored. An allowance from the commercial allocation for gill net and trawl gears would be needed.

2.15 Alternative 14 - Individual Fishing Shares (IFS) Program

A Restricted Access program limits the number of participants in a given fishery. However, merely limiting the number of participants does not guarantee that total fishing effort by the fleet will be limited. This is further complicated when a participant could actually harvest far more than the average historical landings. Consequently, even in Restricted Access programs some form of harvest allocation for the commercial fishing sector is warranted. Such an allocation system must also include incentives to reduce the risks and pressures associated with derby-style fisheries where there is a race to harvest the biggest share of the total harvest allocation.

By dividing the total commercial harvest allocation into IFS, total fishing effort can be controlled while providing for an orderly fishery. Fishing shares represent an individual's portion of the total commercial allocation. Shares are expressed in potential harvestable pounds, or as a percentage-share of the total commercial allocation. This type of individual distribution ensures that total fishing effort is limited to levels consistent with sustainable fisheries goals. Emphasis can then be placed on maximizing the value of the catch and minimizing harvest costs and wastage. Fishers could time their harvest activities around favorable market conditions and would have no incentives to overcapitalize fishing operations by investing in extra fishing equipment beyond what is necessary to catch their share (as this would reduce their profits). Lastly, this system fosters a sense of resource stewardship in the fishing shareholder, treating the resource as their investment with dividends accruing to them from conservation practices.

This alternative could be applied by the Commission in the harvest of California sheephead (for which there is no federal OY). A transfer of jurisdiction from the Council to the State would be necessary to apply this alternative to all nine nearshore species because they are part of the federal groundfish plan and managed by the Council under annual OYs and monthly trip limits.

Nearshore commercial fishing in all areas would be restricted to hook-and-line gear and finfish traps. Nearshore commercial permittees could be allowed to switch between the two gears as appropriate in response to changing market conditions, overall fishing efficiency, and conservation or waste-minimizing efforts. Commercial harvest levels and harvest effort would be controlled through the use of IFS assigned to eligible nearshore fishery permittees. Eligibility criteria would be based on minimum levels of past participation or past performance in the fishery, while encouraging

diversity in the fleet and full- and part-time participants. Fishery participation and performance take into account each permitee's historical landings, value of the landings, proportion of fishing income derived from nearshore landing, and operating costs. Individual Fishing Shares assignments would be made by the Commission, in consultation with the Department.

An IFS represents an exclusive right to catch a portion of the allowable commercial harvest, but does not convey title or ownership of unharvested fish resources. Fishing shares could be assigned to eligible commercial permittees within each regional management area. Permittees could buy, sell, or transfer their individual fishing shares subject to a cap on the percentage of the regional allocation that one person or entity may control in a season. Transfers or sales of fishing shares could be done through the Department, which may serve as escrow agent for the sale or transfer. Only licensed commercial nearshore permittees could harvest and land fishing shares commercially. They could be required to make commercial finfish landings (of nearshore species identified in the NFMP) in at least two out of three consecutive years in order to maintain their nearshore permit and fishing shares claim.

Each regional management area could establish a review board for appeals of initial IFS assignments (including zero-share assignments). A regional review board could petition the Commission to consider new permittees (entrants) or changes in fishing share assignments within their region. However, final decisions on appeals and assignment of fishing shares would be vested in the Commission.

2.16 Alternatives Considered but not Carried Forward

During the scoping process, several alternatives were proposed. Among the factors that may be used to eliminate alternatives from detailed consideration in a document are: (i) failure to meet most of the basic project objectives, (ii) infeasibility, or (iii) inability to avoid significant environmental impacts. The following discusses those generalized alternatives and the reasons for not considering them further.

2.16.1 Ban all commercial fishing within State waters (several suggested going beyond State waters).

The MLMA recognizes the importance of commercial and recreational fisheries to Californians and the need for allocating living marine resources fairly. The MLMA calls for maintaining fish populations that are sought by sport fishers at levels that will provide satisfying levels of sport use. At the same time, the MLMA encourages the growth of commercial fisheries. The MLMA requires that the effects of regulations be allocated fairly between commercial and recreational fishers. It is worth repeating, however, that these objectives are secondary to ensuring that fisheries are sustainable. A commercial moratorium is an allocation issue that would require a policy decision from the Fish and Game Commission (FGC). However, it is a moot point because the California nearshore fishery is currently viable, and it has not declined to the point where managers are faced with the challenge of "re-establishing" the fishery. A FGC policy decision is needed to decide if this proposal is "fair". Reducing the number of commercial fishers (this is a "fringe benefit" of Restricted Access) and using regulations to separate recreational and commercial participants in time and space may achieve the goal of the MLMA of

supporting both commercial and recreational fishing. Also, most of the nearshore finfish catch is recreational, so simply banning commercial fishing may not adequately address conservation issues and further this alternatives fails to meet the basic project objectives.

Even in the absence of fishing, fish density and abundance is not uniform throughout an area or among habitats. Some locations or habitats are intrinsically more favorable for particular species, resulting in areas of greater productivity, increased survival, faster growth, etc., which can lead to uneven abundance. The potential for geographic variability in abundance is compounded by fishing pressure. Fishing effort will never be evenly distributed throughout the range and among the habitats occupied by each nearshore species. Hence, there is a strong likelihood that some areas will be (and have been) fished more heavily than others. The combination of variations in habitat suitability and uneven fishing pressure can exacerbate areas of lower abundance. The key to reducing the risk of serial depletion is to set limits on total catch for each area that are in accordance with the actual productivity of the resource (i.e., sustainable). That way, overall abundance within each geographic region will be maintained at a healthy level.

The heavily fished areas will benefit from enhanced recruitment that originates from more remote areas (or nearby closed areas), where abundance of adult spawners may tend to be high because the fishing pressure is lower. In the event that unacceptably severe serial depletion or severe localized depletion is identified in a particular area, there are numerous ways that routine management measures could directly deal with those problems, including area closures for commercial fishing, time/area restrictions for all types of fishing, and/or commercial gear restrictions for the specific depleted areas, etc.

2.16.2 Proposals for banning various specific gear types (e.g., support banning treble hooks, stick gear, barbless hooks, live trapping, dragging, etc.).

This type of gear restriction is a possibility under routine management measures, but a recommendation by DFG would likely need to be accompanied by an analysis that demonstrates the merits and expected benefits. For example, a field study of hooking mortality might be required. Some degree of geographic depletion is probably inevitable, as long as fishing effort is not evenly distributed throughout the range of each species. The solution to unacceptable levels of geographic depletion is to set the overall catch for each area at a level that can be sustained by the resource within these areas. Should unacceptable levels of geographic depletion be identified, the situation may be addressed on a case by case basis under routine management measures.

This proposed alternative, introduced by United Anglers (UA), may not actually reduce effort and fails to meet most of the basic project objectives. This is because a greater number of commercial fishers probably would be allowed under a Restricted Access program if the fishers were forced to be less efficient than under the current regulations. That is, if the commercial fishery is allotted a given annual tonnage of fish, the capacity goal under a Restricted Access program would call for a larger number of commercial participants if those participants were only allowed to use limited gear. The net effect would not necessarily be a greater reduction in effort than would occur if no

gear restrictions were in place. The crux of this issue is that capacity (fishing power) is matched to the available fish, so it is the available fish that determines effort reduction. If this issue was handled any other way, the UA gear restriction proposal would simply amount to a de-facto "back door" allocation from commercial to recreational.

2.16.3 MSY and OY level should be different than proposed (more conservative than 50% of MSY, set OY at 30% of MSY proxy, move away from MSY as additional essential fishery information is gathered).

While the previous document proposed specific percentages for MSY and OY values, the MLMA does not require use of MSY. The NFMP allows alternative methodologies to MSY for determining sustainable yield, providing those methods constitute the best available information. It is proposed that the management be tiered into three different stages with changes only occurring if adequate data exists to justify the change in management. Therefore, it is not a foregone conclusion that MSY will be the preferred method to determine the sustainable yield for nearshore stocks under data-moderate or data-rich conditions. While it is true that MSY has failed in some cases, it is important to recognize that it also has succeeded in many fisheries and adopting this alternative would be infeasible based on the current data necessary to manage the fishery. Some of the more spectacular failures of MSY were partly due to inability of researchers and managers to recognize changes in productivity that were the result of environmental "regime shift". Efforts will be made to build this kind of adjustment into the nearshore MSY calculations as is proposed in Stage III. An example of this approach may be found in the quota formula for Pacific sardines.

Some stated that they believed that the MSY calculation was flawed because it was based on landings from a period of decline and contrary to Restrepo et al. 1998 guidance on the use of precautionary approaches. It was further recommended that if proxy is used, then it should be no higher than lowest catch in the period. Specific years are not listed or advocated in the draft NFMP to calculate proxy MSY. Upon adoption of the NFMP, the time period and data used for the current MSY proxies should be revisited. This applies to both the Pacific Fisheries Management Council (PFMC) nearshore rockfish calculations and the FGC interim regulations. In fact, the rockfish OY’s will have to be recalculated because it is not possible to reconstruct the exact methods and details of how the PFMC arrived at the current nearshore rockfish OYs. However, any NFMP recalculation probably would not differ greatly from the PFMC OYs because they used Restrepo et al. 1998 for guidance in their calculations.

MSY has a sound scientific basis. Since there are insufficient data to directly determine resource capacity at this time, the fishery would be managed under a MSY/OY proxy that includes a substantial precautionary reduction in allowable catch. Research would be conducted to allow direct calculation of sustainable harvest levels as quickly as possible. Sustainable yield may be calculated using traditional MSY or other methodologies. While caution against using historic catches as a guide to predicting and regulating future catches, this concern is one reason why a substantial precautionary adjustment is included in the "data-poor" calculations for allowable catch. Consequently, there is strong recognition in the NFMP for the need to move to a data-rich situation as quickly as possible. Greater precaution than 50 percent of recent

landings is not advocated by Restrepo et al.1998, which constitutes the best available science. The standard of using "best available information" constitutes explicit guidance for management decisions in general. Since coast-wide optimal yields will not work for nearshore rockfish, the allowable harvest will be established on a regional basis (three regions recommended). At that level, OY's (or other limits on total catch) will accomplish their intended function.

The PFMC used Restrepo et al. 1998 precautionary approaches for general guidance in their calculations. If there is evidence of stock decline throughout the landings time period, then it may be appropriate to use the lowest year as a basis for MSY/OY proxy calculations. In the case of rockfish, the catch history for each species may be examined separately to determine individual MSY/OY proxies, and then summed to obtain an aggregate rockfish OY proxy for the 14 nearshore rockfish species. MSY can work for sedentary species, but it requires greater care, thought, and discretion in applying regulations. The proxies are intended only to be an interim, stop-gap measure to allow ongoing management, while the requisite research is being conducted to directly calculate MSY and OY, or other analyses of sustainable harvest.

In order to prevent location depletion, some suggested that each reef should have it's own OY. In theory this may be a plausible idea, but it is extremely impractical and would be too costly to implement for the foreseeable future. This follows the belief that the resource is in far greater peril and immediate reductions in take and precautionary priorities to allocation appear warranted for both the commercial and recreational sectors. Such belief needs to be supported by data and analysis. A 50 percent reduction in take has already been implemented under current PFMC rockfish regulations and FGC interim regulations.

2.16.4 More habitat should be set aside than proposed (higher in northern California).

The 2001 NFMP draft document recommend a set percentage of habitat be set aside for MPAs (ten percent of the northern and central region and 15 percent in southern region). Percentages were developed as a result of MPA-related literature review, and taking into account increased fishing pressure on nearshore resources in the South Coast Region. According to the NRC report (2001), a minimum of 10 percent of appropriate habitat should be included in marine reserves, if management outside the reserves is excellent. If management outside the reserves is less effective, 20 percent or more area may be required.

Currently, the designation and/siting of MPAs for nearshore fish will be deferred to the Marine Life Protection Act (MLPA) process, except for those proposed for development around the Channel Islands. The MLPA process does not have a percentage target for MPAs and will consider a much broader range of species than just the 19 nearshore species, and therefore it is infeasible to designate MPAs at this time. However, there is considerable overlap and are no inconsistences between the MLPA goals and the NFMP criteria for siting MPAs. The MLPA has identified that providing a network of sources for larval dispersal, and taking into account oceanographic

conditions (e.g. upwelling zones and shadows), which affect larval retention and dispersal as criteria. The criteria identified in the MLPA are compatible with needs of the NFMP to fulfill the mandates of the MLMA. For instance, most species included in the NFMP, release larvae into the water which drift on ocean currents on the order of months. To achieve the intended benefits to nearshore fisheries, the network must place MPAs close enough together to benefit from larval transport between MPAs or from other remote areas that have larval export.

Most of the intended functions for marine reserves in the NFMP are well documented, such as preserving spawning biomass, providing for nonconsumptive value, conserving ecosystems, protecting habitat, and promoting biodiversity. In addition, there is increasing evidence of fishery enhancement outside reserves (Roberts et al. 2001). MPAs are among the most effective means of protecting ecosystems, habitat, and recognizing non-consumptive uses of marine resources. Unlike other management measures that focus on protecting particular species or groups of species, MPAs seek to protect entire communities. A review of studies on MPAs of various sizes, histories, and uses, provides convincing evidence that a network of MPAs can promote ecosystem structure and function, provide a buffer against management mistakes, and allow the monitoring of natural versus human impacts. MPAs covering the majority of the individual home range, of some fish species, have been proven to promote localized increases in abundance, individual sizes and ages, reproductive output, and species diversity particularly for species that are long lived and residential, as are many of the species include in this FMP. In addition, the size of individual MPAs must be large enough to protect adequate spawning biomass and to retain larval recruitment from outside of the MPA. Besides possible benefits to fishermen from fish and/or larvae that emigrate from MPAs, these areas provide unusually rich experiences for divers.