APPENDIX F
TO AMENDMENT 16-3
TO THE PACIFIC COAST GROUNDFISH FISHERY MANAGEMENT PLAN

COWCOD (*SEBASTES LEVIS*)
DRAFT REBUILDING PLAN
ADOPTED APRIL 2004
PACIFIC FISHERY MANAGEMENT COUNCIL

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1.0 Introduction

The Magnuson-Stevens Fishery Conservation and Management Act (MSA), as amended in 1996 by the Sustainable Fisheries Act (SFA), states : "For a fishery that is overfished, any fishery management plan, amendment, or proposed regulations... for such fishery shall... specify a time period for ending overfishing and rebuilding the fishery..." (Sec. 304(e)(4)). The MSA also states this time period "shall be as short as possible," and usually may not exceed 10 years. However, in setting a time period for rebuilding the stock, fishery managers may take into account various mitigating factors, such as the biology of the stock and the needs of fishing communities, such that the time period may exceed 10 years. Rebuilding plans must also take into account variations and contingencies in ecological and environmental conditions that cause maximum sustainable yield (MSY) biomass to vary over time, which affects the practicable time period for rebuilding the stock.

Further detail on stock rebuilding is provided in National Standards Guidelines (published in the Code of Federal Regulations, Chapter 50, Part 600). They specify how rebuilding should occur and, in particular, establish constraints on Council action (50 CFR 600.310(e)). Rebuilding should bring stocks back to a population size that can support MSY (B_{MSY}). A rebuilding plan must specify a target year (T_{TARGET}) based on the time required for the stock to reach B_{MSY}. This target is bounded by a lower limit (T_{MIN}) defined as the time needed for rebuilding in the absence of fishing (i.e., fishing mortality rate [F] = 0). Rebuilding plans for stocks with a T_{MIN} less than 10 years must have a target less than or equal to 10 years. If, as is the case with most of the groundfish stocks, the biology of a particular species dictates a T_{MIN} of 10 years or greater, then the maximum allowable rebuilding time, T_{MAX}, is the rebuilding time in the absence of fishing (T_{MIN}) plus "one mean generation time." Mean generation time is a measure of the time required for a female to produce a reproductively-active female offspring (Pielou 1977; and especially Restrepo, *et al.* 1998) calculated as the mean age of the net maternity function (product of survivorship and fecundity at age). The MSY states that although the rebuilding time should be as short as possible, the needs of fishing communities are a mitigating factor (Sec. 304(e)(A)(i)). In order to balance the need to rapidly rebuild overfished stocks with resulting socioeconomic impacts to fishing communities, the Council has chosen the target years for overfished stocks which are greater than the minimum rebuilding time (T_{MIN}).

Because of the uncertainty surrounding stock assessments and future population trends (due, for example, to variable recruitment), the rebuilding period limits and the target need to be expressed probabilistically. At the outset of the rebuilding period T_{TARGET} should be set so there is at least a 50% probability of achieving B_{MSY} within the T_{MAX}.[1/] For a given fishing mortality rate, rebuilding analyses also provide an estimate of the probability the stock will rebuild by T_{MAX}; this statistic is denoted P_{MAX}.

The Council developed Amendment 12 to the Pacific Coast Groundfish Fishery Management Plan (FMP) to specify an effective process for implementing rebuilding plans. This amendment was approved by the Council in April 2000 and approved by National Marine Fisheries Service (NMFS) on December 7, 2000. However, in January 2001, the Natural Resources Defense Council (NRDC), along with other conservation organizations, challenged the adequacy of Amendment 12 (*Natural Resources Defense Council, Inc. et al., v. Donald Evans, Secretary of Commerce, et al.,* 168 F. Supp. 2d 1149 (N.D. Cal 2001)) in Federal District Court. They claimed rebuilding plans submitted pursuant to Amendment 12 were inadequate for two reasons. First, they did not take the form of FMPs, plan amendments, or regulations as required by the MSA. Second, rebuilding plans could allow overfishing under the "mixed-stock exception." The NRDC argued that the overfished species provisions in the SFA demonstrate Congress's intent to eliminate this exception, so

1/ The use of a low bound 50% probability is not specified in regulations; it is the result of litigation (*Natural Resources Defense Council* v. *Daley, April 25, 2000, U.S. Court of Appeals for the District of Columbia Circuit*).

rebuilding plans should not entertain this exception. The Plaintiffs also argued that the environmental assessment (EA) accompanying Amendment 12 failed to consider a reasonable range of alternatives as required by the National Environmental Policy Act (NEPA). The Court found for the Plaintiffs on the claim that rebuilding measures must conform to the MSA-mandated format of a plan, plan amendment, or regulation and the NEPA-related claim of an inadequate range of alternatives. The Court decided that the second MSA-related claim, on the validity of the mixed-stock exception, was not ripe for judicial review because the exception had not yet been applied to Pacific groundfish management. In response to its findings, the Court ordered NMFS to revise Amendment 12, so rebuilding plans accord with MSA and NEPA requirements.

Because of the litigation described above, in late 2001 work began on a new FMP amendment for the rebuilding plan adoption process that would be consistent with the Court's findings. The Council and NMFS published a Notice of Intent (NOI) to prepare an EIS on April 16, 2002 (67 FR 18576). According to this NOI, the EIS would evaluate two sets of alternatives: one set addressing the framework for rebuilding plan adoption (or the "process and standards") and a second set evaluating different rebuilding strategies that could be adopted as rebuilding plans for overfished species. (These strategies are described in terms of targets and limits, such as T_{TARGET}, T_{MIN}, T_{MAX}, harvest control rules satisfying a given target, and potential management measures to constrain fishing mortality to levels determined by the harvest control rule.) Based on internal discussion, Council staff decided in late 2002 that the process and standards alternatives should be analyzed in a separate environmental document and adopted as Amendment 16-1. Amendment 16-1 establishes a legally-compliant framework for the adoption and implementation of rebuilding plans. Once rebuilding plans are adopted and approved, two strategic rebuilding parameters, the target rebuilding year (T_{TARGET}) and the harvest control rule (expressed as a fishing mortality rate), are published in federal regulations at 50 CFR 660.370.

Evaluated in an EA, Amendment 16-1 was approved by NMFS in November 2003, and the final rule was published on February 26, 2004 (69 FR 8861), with an effective date of March 29, 2004. Amendment 16-2 adopted rebuilding plans for canary rockfish, darkblotched rockfish, lingcod, and Pacific ocean perch. The Council adopted these rebuilding plans at their June 2003 meeting. NMFS approved the amendment on January 30, 2004, and the final rule for this action was published on April 13, 2004 (69 FR 19347) with an effective date of May 13, 2004. The Council adopted rebuilding plans addressed by Amendment 16-3, covering bocaccio, cowcod, widow rockfish, and yelloweye rockfish, at their April 2004 meeting.

Section 4.5.3.2 of the Pacific Coast Groundfish FMP, as amended, states that rebuilding plans as a whole will be published in the next annual Stock Assessment and Fishery Evaluation (SAFE) document after their approval. It also specifies the contents of rebuilding plans. The remainder of this rebuilding plan addresses the topics as enumerated in the FMP, except for the last two topics. Topic eight, a discussion of how the rebuilding plan will reflect traditional participation in the fishery by U.S. fishermen for fisheries managed under international agreement is not relevant to this rebuilding plan. Topic nine simply states that any additional information useful to the rebuilding plan's goals and objectives be included. Such information is included under the first six topics, enumerated below, as appropriate.

2.0 The Biology and Current Status of the Stock and Fisheries Affected by Stock Rebuilding Measures

2.1 Life History Characteristics

Relatively little is known about cowcod (*Sebastes levis*), a species of large rockfish that ranges from Ranger Bank and Guadalupe Island in central Baja California to Usal, Mendocino County, California (Miller and Lea 1972), and may infrequently occur as far north as Newport, Oregon. Cowcod have been assessed only once (Butler, *et al.* 1999).

Love *et al.* (2002) and Barnes (2001) described cowcod distribution and life history. Cowcod are most abundant in waters off central and southern California. They range from 22 m to 491 m in depth and are considered to be parademersal (transitional between a midwater pelagic and benthic species). Adults are commonly found at depths of 180 m to 235 m, and juveniles are most often found in 30 m to 149 m of water (Love, *et al.* 1990).

MacGregor (1986) found that larval cowcod are almost exclusively found in Southern California and may occur many miles offshore. Juveniles occur over sandy bottom areas, and solitary ones have been observed resting within a few centimeters of soft-bottom areas where gravel or other low relief was found (Allen 1982). Young of the year have been observed on fine sand and clay sediment as well as oil platform shell mounds and other complex bottom features at depths ranging from 22 fm to 122 fm (40-224 m). Adult cowcod are primarily found over high relief rocky areas (Allen 1982). They are generally solitary, but occasionally aggregate (Love *et al.* 1990). Solitary subadult cowcod have been found in association with large white sea anemones on outfall pipes in Santa Monica Bay (Allen 1982). Although cowcod are generally not migratory, they may move, to some extent, to follow food (Love 1991).

Cowcod can live to be at least 55 years old. Maximum size is 94 cm (37 in) and 13 kg (28.5 lb). The instantaneous rate of natural mortality is believed to be 0.08 (92% adult annual survival when there is no fishing mortality) (Butler *et al.* 1999). Average size at age of mature females is similar to males. Females reach 90% of their maximum expected size by 40 years (Butler *et al.* 1999).

Cowcod are ovoviviparous, and large females may produce up to three broods per season (Love *et al.* 1990). Spawning peaks in January in the Southern California Bight (MacGregor 1986). Fecundity is dependent on size and ranges from 181,000 to 1,925,000 eggs. Larvae emerge at about 5.0 mm (MacGregor 1986).

Little is known about ecological relationships between cowcod and other organisms. Small cowcod feed on planktonic organisms such as copepods. Juveniles eat shrimp and crabs, and adults eat fish, octopus, and squid (Allen 1982).

2.2 Current Stock Status and Management History

While cowcod are not a major component of the groundfish fishery, they are highly desired by both recreational and commercial fishers because of their bright color and large size. The cowcod stock south of Cape Mendocino has experienced a long-term decline. The cowcod stock in the Conception area was assessed in 1998 (Butler *et al.* 1999). Abundance indices decreased approximately tenfold between the 1960s and the 1990s, based on commercial passenger fishing vessel (CPFV) logs (Butler *et al.* 1999). Recreational and commercial catch also declined substantially from peaks in the 1970s and 1980s, respectively.

B_0 was estimated to be 3,370 mt, and 1998 spawning biomass was estimated at 7% of B_0, well below the 25% overfishing threshold. As a result, NMFS declared cowcod in the Conception and Monterey management areas overfished in January 2000. Large areas off Southern California (the Cowcod Conservation Areas [CCAs]) have been closed to fishing for cowcod. The stock's low productivity and declined spawning biomass also necessitates an extended rebuilding period, estimated at 62 years with no fishing-related mortality (T_{MIN}), to achieve a 1,350 mt B_{MSY} for the Conception management area.

There is relatively little information about the cowcod stock, and there are major uncertainties in the one assessment that has been conducted. The assessment authors needed to make estimates of early landings based on more recent data and reported total landings of rockfish. Age and size composition of catches are poorly sampled, population structure is unknown, and the assessment was restricted to Southern California waters.

A cowcod rebuilding review was completed in 2003 which validated the assumption that non-retention regulations and area closures have been effective in constraining cowcod fishing mortality (Butler, *et al.* 2003). These encouraging results are based on cowcod fishery-related landings in recreational and commercial fisheries. Discard information from the West Coast Groundfish Observer Program was unavailable at the time of the review and CPFV observations showed negligible discards. Angler-reported discards were not included in the analysis. Non-retention regulations and limited observation data have increased the need for fishery independent population indices. A full stock assessment is scheduled to be conducted in 2005.

2.3 Fisheries Affected by the Rebuilding Plan

In recent years cowcod have been caught in very low quantities by fisheries in Central and Southern California. Since first being assessed, the cowcod optimum yield (OY) has been set at 5 mt or less, enough to accommodate small amounts of unavoidable bycatch. Most catches occur in Southern California recreational fisheries with smaller amounts caught by limited entry groundfish trawl vessels. For example, 2004 catch projections show recreational fisheries south of Cape Mendocino accounting for 38% of total cowcod fishing mortality and limited entry trawl fisheries accounting for 13% (PFMC 2004b).

Table 1 shows the distribution of 2003 cowcod landings by major fishery sector. Since cowcod retention is prohibited in commercial and recreational fisheries, landings are small. The 0.05 mt of shoreside trawl landings are illegal.

TABLE 1. 2002 base landed catch by fishery for cowcod (mt).

Sector	Postseason Catch Estimates for 2003
Recreational[a/]	0
Fixed Gear Limited Entry	0
Open Access	0
Tribal	0
Research	0.02
Trawl (Shoreside)	0.05
Trawl (At Sea)	0
Total Postseason Catch Estimate[b/]	0.07
2004 Estimated Total Mortality[c/]	2.8
2004 Total Catch OY[c/]	4.8
1998 Total Catch OY	n/a

a/ Preliminary.
b/ Federal permits only; does not include Oregon and California state-issued scientific fishing permits.
c/ From Table 5-12 Amendment 16-3 Rebuilding Plans EIS. Projected annual estimated mortality as of March 15, 2004. Category totals include landings made on exempted fishing permits (EFPs).

3.0 Methods Used to Calculate Stock Rebuilding Parameters

The Cowcod rebuilding analysis (Butler and Barnes 2000) was completed before the SSC default rebuilding analysis methodology (Punt 2002), described in Section 4.5.2 of the Pacific Coast Groundfish FMP, had been

developed. Instead, it uses a surplus production model using a log-normal distribution fitted to recruitment during 1951-1998. In April 2004 the SSC recommended that future cowcod stock assessments use a model whose output can be used in the default rebuilding analysis methodology. A full stock assessment and rebuilding analysis are scheduled for 2005.

4.0 Estimates of Rebuilding Parameter Values at the Time of Rebuilding Plan Adoption

Amendment 16-3 incorporates rebuilding parameter values into Section 4.5.4.1 of the Pacific Coast Groundfish FMP. These values are derived from the stock assessment (MacCall 2003b) and rebuilding analysis (MacCall 2003a). The Council adopted the following rebuilding plan parameters:

Year stock declared overfished:	2000
Year rebuilding plan adopted:	2004
B_0:	3,367 mt
B_{MSY}:	1,350 mt
$B_{CURRENT}$ (% of B_0)	7% in 1998
T_{MIN}:	2062
T_{MAX}:	2099
P_{MAX}:	60%
T_{TARGET}:	2090
Harvest control rule:	F= 0.0093

For the harvest control rule, the fishing mortality rate is applied to the exploitable biomass estimate to determine the OY for a given fishing period. The Council may also apply a precautionary adjustment to this value. In 2004 the OY was 4.8 mt.

Rebuilding parameter values are likely to change over time as stock size and structure changes. While most of these parameters reflect the biology of the stock or national policy described in National Standard Guidelines, the interrelated values of the target year and the harvest control rule may be changed by the Council. For example, changes in stock productivity may necessitate revision of the harvest control rule in order to rebuild the stock by the identified target year with the same rebuilding probability (P_{MAX}). The values of these two parameters are published in federal regulations (50 CFR 660.370) and any such change is subject to notice-and-comment rulemaking.

5.0 Process and Standards For Reviewing the Rebuilding Plan

The MSA states that the Secretary of Commerce shall review rebuilding plans routinely, and at least every two years, to determine if adequate progress is being made in stock rebuilding (§304(e)(7)). Section 4.5.3.1 of the Pacific Coast Groundfish FMP describes a range of review processes and standards that may be used by the Council to conduct such a review. For all adopted rebuilding plans the Council chose the following standard:

> The Council, in consultation with the Scientific and Statistical Committee (SSC) and Groundfish Management Team (GMT), will determine on a case-by-case basis whether there has been a significant change in a parameter such that the chosen management target must be revised.

As part of their statement at the April 2004 Council meeting (Exhibit C.12.b, Supplemental SSC Report), the SSC discussed the development of criteria to be used in the case-by-case review process adopted by the Council for rebuilding plan reviews:

> The SSC notes that each rebuilding plan needs to include standards for evaluating the progress of rebuilding. These standards need to be developed for use in the assessments that will be conducted during 2005. As directed by the Council, the SSC Groundfish Subcommittee will develop standards and include them in its Terms of Reference for Rebuilding Analyses. This may require a meeting of the SSC Groundfish Subcommittee, particularly if a draft set of standards are to be provided to the Council for revision in September 2004 and final adoption in November 2004. The standards are likely to include a comparison of current stock status relative to that expected under the current rebuilding plan.

6.0 Management Measures Used to Rebuild the Stock

6.1 Management Measures Incorporated into the FMP Specifically to Rebuild Cowcod

Given the particular life history characteristics of cowcod, the Council will continue to use species-specific area closures to protect cowcod (the CCAs). As new information becomes available on cowcod behavior and fisheries interactions with cowcod, the boundaries or related regulations concerning the current CCAs may change, and additional CCAs may be established by regulation. Other management measures that affect cowcod are implemented through the biennial management cycle. To provide information about the types of management measures implemented through the periodic management, harvest specifications, and management measures applying to cowcod in 2004 are discussed below.

6.2 Management Measures Used in 2004 to Rebuild the Stock

The Pacific Coast Groundfish FMP establishes a framework for the periodic application of harvest specifications and management measures. Harvest specifications consist of "optimum yield" (OY) values (a total allowable catch) applicable to a calendar year. OYs are established individual stocks, stock complexes, and species groups, and represent a total fishing mortality (landed catch plus bycatch) threshold. All fully assessed stocks, and therefore all overfished species, have individual OYs. A variety of management measures are applied to constrain total fishing mortality to a level at or below the OY. With the adoption of the FMP Amendment 17 the Council transitioned to a two-year management cycle. OYs still apply to a calendar year, but the process of establishing them and identifying necessary management measures occurs every two years. With implementation, 2004 is the last year in the annual cycle; the first biennial cycle applies to 2005-2006.

Groundfish fisheries are multi-species; several target species and a range of incidentally-caught species may be caught in a single haul. For this reason, there are few management measures intended solely for a single overfished stock. Instead, a variety of measures are applied to a given fishery sector to constrain fishing mortality of the full range of target and incidentally-caught species. The current management regime, therefore, induces regulatory discards, which for overfished species can be an important component of total fishing mortality. Bycatch has, therefore, become a crucial issue in effective groundfish management. This has necessitated the development of more accurate estimates of bycatch in order to track total fishing mortality. The measures in effect in 2004 and their effect on constraining cowcod catches are summarized below. This list generally follows the discussion of management measures that may be implemented as part

of the framework described in Section 6.2 of the Pacific Coast Groundfish FMP. A more detailed discussion of many of these measures may be found in the Final EIS for the 2004 groundfish harvest specifications and management measures (PFMC 2004b).

Harvest limits (harvest guidelines or quotas): As described above, the Council sets OYs for each overfished stock (among other managed species). For overfished species these OYs are calculated based on information from the most recent stock assessment and rebuilding analysis with the value determined by the strategic parameters (T_{TARGET}, $P_{MAX,}$ and harvest control rule) identified in the rebuilding plan. Although resulting OYs are considered harvest guidelines, the Council has treated them as hard limits on total fishing mortality for overfished species. For example, they have closed fisheries late in the year if an overfished species' OY is projected to be exceeded. Although projected landings of cowcod in 2004 are about half the OY, because the OY is very low in absolute terms cowcod fishing mortality is an important consideration in Southern California recreational fisheries.

Permits, licenses, and endorsements: Participation in the Washington, Oregon, and California groundfish fishery was partially limited beginning in 1994 when the federal vessel license limitation program was implemented (Amendment 6). Subsequently, Amendment 9 further limited participation in the fixed-gear sablefish fishery by establishing a sablefish endorsement. There is currently no federal permit requirement for other commercial participants (fishers or processors) or recreational participants (private recreational or charter). A buyback of vessels in the limited entry trawl fishery, and associated permits, was completed in 2003. This reduced participation in this sector by roughly one-third.

Trip landing and frequency limits: Cumulative trip limits have been a key fixture of groundfish management for many years. Currently, these limits set for stocks, stock complexes, and species groups dictate the total amount of fish that may be landed during a two-month period. Separate limits are established for the limited entry trawl, limited entry fixed gear, and open access sectors. Landing limits on target species may be adjusted in order to limit coincident catch of overfished species. Retention of cowcod is prohibited in all commercial fisheries.

Seasons: California manages its recreational fisheries according to four sub-areas defined by latitudinal boundaries. Different closed seasons have been applied, and modified inseason, primarily to limit canary rockfish catches, the most constraining of the overfished species. Although not a primary consideration in the design of these measures, they may have a modest effect on limiting cowcod fishing mortality.

Area closures: As noted above, the Cowcod Conservation Areas (CCAs), comprising two areas south of Point Conception, California, is the main management measure for limiting cowcod fishing mortality (see Figure 1). This closed area was first implemented in 2001. All commercial bottom fishing and the target fishery for California halibut (managed by the state) are prohibited within the CCA. Recreational fisheries targeting species associated with cowcod (such as ocean whitefish and California halibut) are also prohibited in these closed areas. Beginning in 2002, a Rockfish Conservation Area (RCA) came into use as a way of decreasing bycatch of overfished species. It encloses the depth ranges where bycatch of overfished species is most likely to occur, based on information retrieved from log books and the at-sea observer program, and fishing by designated groundfish fishery sectors is prohibited within its boundaries. The boundaries vary by season and fishery sector, and may be modified in response to new information about the geographic and seasonal distribution of bycatch. Although its is not configured specifically with cowcod in mind, the RCA may also reduce total fishing mortality on this stock. California has implemented, and modified inseason, closed areas in their recreational management sub-areas.

Gear restrictions: Definitions of legal gear types and restrictions on mesh size in trawl gear have been part of the FMP since its inception. More recently, restrictions have been put on the use of trawl nets equipped with large footropes. By using large footropes with heavy roller gear, bottom trawlers can access rocky

habitat on the continental shelf. In areas shoreward of the RCA large footrope gear is prohibited, preventing trawlers from assessing rocky habitat in these shallower depths. In areas seaward of the RCA, either small or large footrope gear may be used, although large footrope gear is the preferred type in these depths. In addition, cumulative trip limits are structured to encourage vessels to fish exclusively in deep water where some other overfished species, including cowcod, are less often encountered. These trip limit measures do not affect cowcod, however, since retention is prohibited. Exempted fishing permits (EFPs) have been authorized to test new gear that reduces the incidental catch rate of overfished species. For example, tests of the selective flatfish trawl, a trawl net design with a cut back headrope, has shown substantial reduction in catches of some rockfish species while maintaining catch rates for target flatfish species. Requiring gear modifications of this type may someday contribute to further reduction in the already small bycatch of cowcod.

Size limits: No size limits apply to cowcod since retention is prohibited in both commercial and recreational fisheries.

Bag limits: These measures are used for recreational fisheries. As noted, cowcod may not be retained by recreational fishermen.

Fishery monitoring and bycatch estimation: All groundfish landings are monitored through a fishticket system requiring reporting by buyers and processors. As noted, bycatch has become a crucial component of total fishing mortality for overfished species. NMFS has developed a "trawl bycatch model" (Hastie 2001; Hastie [2003]), which is used to project total fishing mortality in the limited entry groundfish trawl fishery for key species, based on a given set of management measures.[2/] This model includes a depth component and is used to determine the depth ranges enclosed by the RCA. NMFS implemented the West Coast Groundfish Observer Program in August 2001, and these data were first used to estimate total fishing mortality beginning in mid-2003. The trawl bycatch model has been continually updated, both to evaluate the effect of different closed area configurations on total fishing mortality and to incorporate new bycatch rates based on observer data (Hastie 2003). In 2004 bycatch modeling was expanded to the primary sablefish fishery prosecuted by limited entry fixed gear vessels (Hastie 2004). As more observer data from different fishery sectors become available, further model extensions will be developed to more accurately estimate bycatch of overfished species in these sectors.

In recent years, efforts have been made to improve recreational fishery sampling in California. For instance, in 2001 the Pacific States Marine Fisheries Commission (PSMFC), with support from NMFS, began a new survey to estimate party/charter boat (CPFV) fishing effort in California. This survey differed from the traditional Marine Recreational Fisheries Statistical Survey (MRFSS) telephone survey of anglers to determine CPFV trips by two-month period. The survey sampled 10% of the active CPFV fleet each week to determine the number of trips taken and the anglers carried on each trip. This 10% sample was then expanded to make estimates of total angler trips for Southern California and Northern California. However, the requisite precision for managing for the low OYs of overfished species like canary rockfish and bocaccio was still lacking. Fishery scientists from the California Department of Fish and Game (CDFG) and the PSMFC designed a new program for sampling California's recreational fisheries, incorporating both the comprehensive coverage of the MRFSS program and the high quality sampling of CDFG's Ocean Salmon Project. The goal of this new program, the California Recreational Fisheries Survey (CRFS), is to produce in a timely manner marine recreational, fishery-based data needed to sustainably manage California's marine recreational fishery resources. The changes proposed in this program should increase the timeliness and

2/ A large proportion of total groundfish landings is attributable to this sector. Accurately predicting total catch mortality in this sector is, therefore, crucial in determining how well a given set of management measures will constrain fishing to OYs.

accuracy of recreational fisheries data so that they can be more effectively used for in-season monitoring, estimating take for species of concern, developing harvest guidelines, producing stock assessments, and providing other information critical to management decisions. The PSMFC and CDFG fully implemented the CRFS plan in January 2004.

7.0 Goals and Objectives of the Rebuilding Plan

The Pacific Coast Groundfish FMP identifies the following goals and objectives of rebuilding plans:

> The overall goals of rebuilding programs are to (1) achieve the population size and structure that will support the MSY within the specified time period; (2) minimize, to the extent practicable, the adverse social and economic impacts associated with rebuilding, including adverse impacts on fishing communities; (3) fairly and equitably distribute both the conservation burdens (overfishing restrictions) and recovery benefits among commercial, recreational, and charter fishing sectors; (4) protect the quantity and quality of habitat necessary to support the stock at healthy levels in the future; and (5) promote widespread public awareness, understanding, and support for the rebuilding program. More specific goals and objectives may be developed in the rebuilding plan for each overfished species.
>
> To achieve the rebuilding goals, the Council will strive to (1) explain the status of the overfished stock, pointing out where lack of information and uncertainty may require that conservative assumptions be made in order to maintain a risk-averse management approach; (2) identify present and historical harvesters of the stock; (3) where adequate harvest sharing plans are not already in place, develop harvest sharing plans for the rebuilding period and for when rebuilding is completed; (4) set harvest levels that will achieve the specified rebuilding schedule; (5) implement any necessary measures to allocate the resource in accordance with harvest sharing plans; (6) promote innovative methods to reduce bycatch and bycatch mortality of the overfished stock; (7) monitor fishing mortality and use available stock assessment information to evaluate the condition of the stock; (8) identify any critical or important habitat areas and implement measures to ensure their protection; and (9) promote public education regarding these goals, objectives, and the measures intended to achieve them.

No additional goals and objectives are identified for the cowcod rebuilding plan.

8.0 Potential or Likely Allocations Among Sectors

In any given year, the Council will recommend to NMFS harvest regulations that indirectly allocate available harvest among uses in what the Council believes is an optimal fashion. (The FEIS for Amendment 16-3 contains information on past allocations among different fishing strategies, based on an analysis of landings data (PFMC 2004a, Appendix B).) The Council will likely vary the allocation between different fisheries over the period of the rebuilding plan, based on new information about bycatch rates and the marginal economic value of overfished species catches. As stocks recover at different rates the overfished species that shape fishery management will also change. Within a given sector or region the species with the lowest OY relative to target species strongly influences the types of management measures that must be imposed, depending on the bycatch rate for a particular gear type. In determining an optimal allocation, the Council is likely to take into account equity, geographic allocation, and other social factors in addition to economic efficiency.

Given this indirect form of allocation, projected total catch by sector, reported in the 2004 harvest specifications FEIS (PFMC 2004b), provide a good indicator of this de facto allocation. Table 2.2.5-1 in that document reports these estimates for 2004, which proportionately by broad sector are: 13% for the limited entry non-whiting trawl sector, 2% for limited entry fixed gear fisheries, no catches by the whiting fishery,

2% for open access fisheries, no catches by tribal fisheries, 38% for recreational fisheries, no catches by research fisheries, and 4% for EFP fisheries, all by the California nearshore selective flatfish trawl EFP. According to these projections, the remaining 42% of the OY was not predicted to be caught.

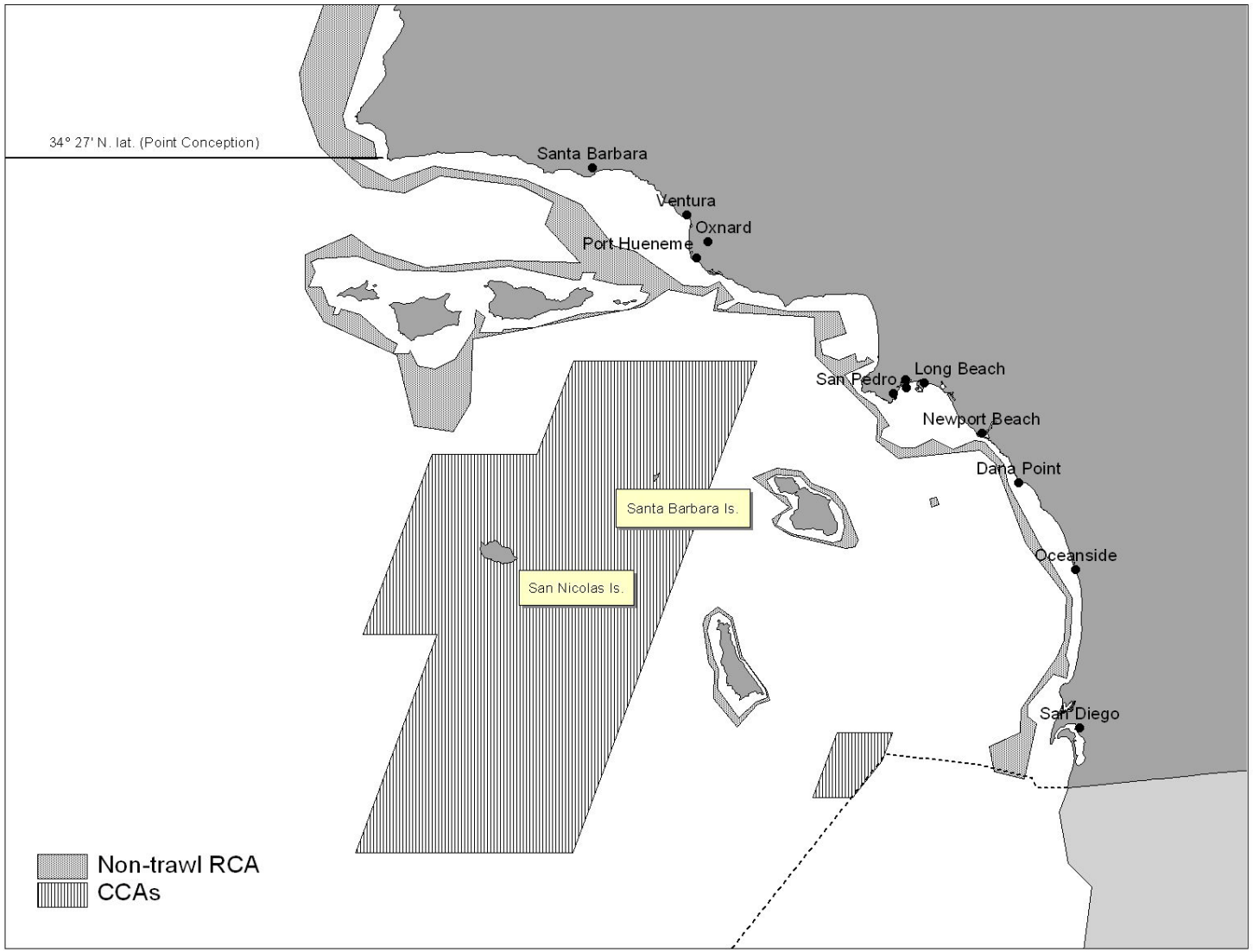

FIGURE 1. Cowcod Conservation Areas and Nontrawl Rockfish Conservation Area in 2004.

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