Chapter 5 Analysis of Alternatives to the Proposed Project

The ED includes a range of alternatives to the proposed project, or its location, that could feasibly accomplish the basic objectives of the project and could avoid or substantially lessen one or more of the project-related effects. Sufficient information is provided about each alternative to allow the Commission and the public a meaningful evaluation, analysis, and comparison to the proposed project. CEQA guidelines state the ED need not consider an alternative whose effect cannot be reasonably ascertained and whose implementation is remote and speculative, nor be required to consider alternatives which are infeasible. Of those alternatives, the document need examine in detail only the ones that the lead agency determines could feasibly attain most of the basic objectives of the project. The proposed project includes measures that work in combination to reach the goals of the NFMP. Some of these measures have alternatives that could be selected and inserted instead of or in addition to the recommended measures. No alternative for MPAs are provided because identifying alternatives for MPAs is the responsibility of the MLPA process.

5.1 Alternative 1 - No Project

The nearshore fishery encompasses those finfish species occurring in nearshore waters within one mile of land (Weber and Heneman 2000) that are not managed in existing fishery management plans and includes more than 100 different species of fish, 19 of which are species of concern. These 19 include: cabezon, California scorpionfish, California sheephead, kelp and rock greenlings, monkeyface prickleback, and black, black and yellow, blue, brown, calico, China, copper, gopher, grass, kelp, olive, quillback and treefish rockfish. 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 and continued by the NFMP. 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 PCGFMP (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.

In data-poor situations such as currently exist for nearly all nearshore species (except for black rockfish which is data-moderate), 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). 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 (i.e., 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.

5.1.1. Effects to Air Quality

Increases in ambient air pollutant levels above NAAQS or CAAQS would not reasonably be expected to occur in the foreseeable future if the project were not approved, based on current plans, and consistent with available infrastructure and community services.

5.1.2 Effects to Water Quality

Short-term and long-term pollution effects will continue at former levels under the no project alternative. Anthropogenic sources of pollution include: point source discharges, dredging activities, surface runoff, thermal discharges and oil/hydrocarbon discharges. The current levels of fishing activities are not anticipated to alter sediment deposition rates except for the short-term effects of bottom disturbance from fishing equipment (e.g., anchors, nets, trawl doors) and the associated increases in suspended sediment and turbidity plumes.

Current impacts of dredging and effects to habitat and organisms at the disposal site will continue. Dredging and disposal of dredged material may adversely affect infaunal and bottom-dwelling organisms at the site by removing immobile organisms, by smothering, such as polychaete worms, and other prey types, or forcing mobile animals, such as fish, to migrate. Benthic plants and animals present prior to a dredge or disposal events are unlikely to re-colonize if the composition of the sediment is drastically different from exiting conditions. Turbidity plumes of suspended particulates may reduce light penetration, lower the rate of photosynthesis (e.g. in adjacent eelgrass or kelp beds) and the primary productivity of an aquatic area, if suspended for extended periods of times. If suspended particulates persist, fish may suffer reduced feeding ability, and sensitive habitats, such as submerged aquatic vegetation beds, which provide sources of food and shelter, may be damaged. Toxic metals and organics, pathogens, and viruses absorbed or adsorbed to fine-grained particulates in the material may become biologically available to organisms either in the water column or through food chain processes (PFMC 1998).

Dredging, as well as the equipment used in the process such as pipelines, may damage or destroy spawning, nursery, or other sensitive habitats such as emergent marshes and subaquatic vegetation. Dredging may also modify current patterns and water circulation of the habitat by changing the direction or velocity of water flow, water circulation, or otherwise changing the dimensions of the water body traditionally utilized by fish for food, shelter, or reproductive purposes.

Releases of petroleum products and garbage would continue, but not likely increase. The discharge of exploratory drill muds and cuttings can result in varying degrees of change on the sea floor and affect the feeding, nursery, and shelter habitat for various life stages of groundfish and shellfish species that are important to commercial and recreational fishers. Drilling muds and cuttings may adversely affect bottom-dwelling organisms at the site by burial of immobile forms or forcing mobile forms to migrate (PFMC 1998).

The withdrawal of ocean water by offshore water intake structures occurs along the California coast. Water withdrawn for cooling water or a source of drinking water, as in the case of desalinization plants, affect organisms through impingement on intake screens, entrainment through the heat-exchange systems, or discharge plumes of both heated and non-heated effluent. The water taken into these plants withdraw most larval and post-larval marine fishery organisms, and some proportion of more advanced life stages (PFMC 1998).

Wastewater effluent and non-point source/stormwater discharges may affect the growth and condition of groundfish, other species of fish, and prey species if high contaminant levels are discharged. Storm water runoff from urban areas is a major source of pollution in coastal waters. Because runoff is an untreated pollution source, it contains high concentrations of contaminants and is a significant health hazard to humans (MMS 2001). If contaminants are present, their effects may be manifested by absorption across gill membranes or through bioaccumulation as a result of consuming contaminated prey. Outfall sediments may alter the composition and abundance of benthic community invertebrates living in or on the sediments. The use of biocides to prevent biofouling or the discharge of brine, as a byproduct of desalinization, can

reduce or eliminate the suitability of water bodies for populations of fish species and their prey in the general vicinity of the discharge pipe. Mass emissions of suspended solids, contaminants, and nutrient overloading from these outfalls also may affect submerged aquatic vegetation sites including eelgrass and kelp beds. These beds are frequently utilized by groundfish and other fish species for shelter and protection from predators, and for food by consuming organisms associated with these beds (PFMC 1998).

Effects of water quality on the finfish and their environment would continue to occur with the no project alternative. While fishing activities are not known to affect salinity, temperature, currents, and dissolved oxygen levels in the ocean, trawling does increase temporarily turbidity and the potential to release pollutants adsorbed to the sediments. The full extent of these impacts have not been fully researched. Therefore, effects to water quality would continue with the adoption of the no project alternative.

5.1.3 Effects to Geology

Effects to geology, with the no project alternative, would include the continued minor modifications to the sea floor from bottom trawling and anchor placement. These impacts are generally temporary but could be locally important if unique geological features are permanently damaged. The current fishing levels are not anticipated to increase erosion processes nor affect slope stability.

5.1.4 Effects to Physical Oceanography

No changes to circulation patterns or oceanographic conditions (e.g., water temperature, dissolved oxygen levels, and salinity) are expected with the no project alternative. Fishing activities have a remote possibility of affecting dissolved oxygen levels if an accident occurred and a full load of fish were discharged into an area with minimal circulation such that the decaying fish process utilized the oxygen in that localized area.

5.1.5 Effects to Coastal Habitat

Estuaries are naturally dynamic and complex, and human actions that degrade or eliminate estuarine conditions have the effect of stabilizing and simplifying this complexity thus reducing their ability to function in a manner beneficial to anadromous and marine fish. The ability of habitats to support high productivity levels of marine resources is diminishing (PFMC 1998). Point and non-point discharges, waste dumps, eutrophication, acid rain, and other human impacts reduce this ability. Population growth and demands for international business trade along the Pacific rim exert pressure to expand coastal towns and port facilities, resulting in net estuary losses (PFMC 1998).

5.1.6 Effects to Benthic Habitat

Soft and hard-bottom seafloor resources have been, and continue to be, impacted by commercial and recreational fishing activities. In particular, alteration of hard-bottom habitat by rockfish bottom trawling activities is high (MMS 2110). Physical disturbances to the soft-bottom habitat from the no project alternative may cause minor

changes in localized species abundance or composition from existing fishing activities. Soft-bottom infauna are expected to rapidly repopulate or recolonize, and changes are expected to be within natural variability for the resources. Fishing gear affects the benthic resources by removing marine plants, corals, and sessile organisms, upending rocks, leveling rock formations, and resuspending sediments and associated pollutants.

Existing effects to hard-bottom substrate result in minor changes in species composition and community structure by altering the natural composition of the substrate such as breaking the larger rocks into smaller pieces by trawl gear. Anchors and their chains can crush or smother long-lived animals and break portions of the rock formation. A study conducted in 1995 (MMS 2001) found that hard-bottom communities will not recover to pre-disturbed conditions where substrate has been altered and, instead, a different type of hard substrate community develops. Recovery takes years to decades depending on the complexity of the community being altered. Multiple trawling passes, and the resulting resuspension of sediments, lead to direct smothering, and the subsequent turbidity plumes can adversely affect filter-feeding organisms such as the sponges, cup corals, and anemones found on naturally occurring hard-bottom reefs.

Effects of the no project alternative include disturbance and displacement of fish, temporary loss of prey items, permanent loss of hard-substrate habitat, and alteration of community structure on both a temporary and permanent basis depending on the changes to the benthic habitat.

5.1.7 Effects to Pelagic Habitat

Effects to pelagic habitats would still occur from pollution discharges. The no project alternative would not change gear types from those that currently exists. In addition, bycatch would continue to affect the nearshore fishes, marine mammals, and marine and coastal birds. The potential for marine turtles and fishing gear interactions would remain unchanged in their utilization of pelagic habitats for migration and feeding. Ghost fishing of lost gear is one of the most serious impacts to pelagic species from existing fishing activities which would continue with the no project alternative.

5.1.8 Effects to Areas of Special Concern

Currently, Essential Fish Habitat (EFH) is affected by non-fishing activities including: dredging, fill, excavation, mining, impoundment, discharge, water diversions, thermal additions, introduction of exotic species, elimination, diminishing, or disruption of the function of EFH, and pollution from point and non-point sources. These would continue with the no project alternative. In addition, fishing activities would continue in sanctuaries, refuges, and reserves as currently permitted by Law. Those fishing activities, that are not affected by this NFMP such as salmon fishing, would continue in all areas as permitted by Law. Therefore, areas of special concern would continue to be impacted by the no project alternative.

5.1.9 Effects to Threatened and Endangered Species

5.1.9.1 Effects to Marine Mammals

Under this alternative, existing management of the nearshore fishery would continue as regulated by the Commission and Council. NMFS lists the CPFV fishery and the finfish live-trap/hook-and-line fisheries as Category III fisheries; those with a remote likelihood of marine mammal interaction, or no known serious injuries or mortalities. Participants in Category III fisheries may incidentally take marine mammals without registering for, or receiving a NMFS authorization. There is no category classification for recreational angling.

Nearshore species are caught by commercial fishermen utilizing hook-and-line, trap gear, and set gill and trammel nets, and by recreational anglers fishing from CPFV's, private boats, or from shore, utilizing hook-and-line gear. Because fishing for nearshore species takes place throughout the state, the potential exists for inadvertent interactions with a number of marine mammal species. However, these interactions differ among the individual species and species groups. Pinnipeds and coastal species such as the southern sea otter, gray whale, and common bottlenose dolphin, are more likely to interact with the nearshore fishery than species of the open ocean such as dolphins and whales. There are pinniped rookeries present at several Channel Islands and offshore islands, including Año Nuevo Island and the Farallons, that are subject to disturbance by commercial and recreational fishermen. However, closures have already been enacted to keep fishing boats a reasonable distance offshore from the rookeries to minimize interactions and disturbances, particularly during the pupping and breeding season.

All six species of endangered whales are known to utilize the nearshore area for either feeding or during migrations. The sei and northern right whale are considered rare in California, and no fishery related mortalities or serious injuries have been observed for these two species (Forney et al. 2000). The California shark-swordfish drift gill-net fishery is known to interact with the sperm, humpback, and fin whales. While this fishery may interact with blue whales, no documented interactions have occurred (Forney et al. 2000). There is a permit for the taking of blue-fin tuna with drift gill-nets of the same size as the shark-swordfish drift gill-net in central California (Olivas pers. comm.). Since this fishery has only recently been permitted, no interactions have yet occurred, but are possible.

There are no documented serious injuries or mortalities of northern fur seals or Steller sea lions with any gear associated with the nearshore fishery. However, strandings data have indicated that Guadalupe fur seals interact with hook-and-line gear, and a portion of these interactions may be attributed to gear used in the nearshore fishery. However, the total U.S. fishery mortality (mortality from all known fisheries) and serious injury for this stock is less than 10 percent of their PBR (Forney et al. 2000).

Sea otters are primarily found in water depths less than about 100 feet and, because of their close association with kelp beds in many nearshore areas, there is the potential for interaction with nearshore fisheries. However, sea otters are not found throughout the entire area encompassed by the nearshore fishery, as they range from Point Año Nuevo south to Purisima Point, with a small colony on San Nicholas Island. Sea otters have been found dead with wounds from boat propellers, while others are known to have drowned as a result of becoming entangled in fishing lines (FWS 2000).

Eleven sea otter carcasses, out of 1,680 collected from 1968 to 1989, were known to have drowned as a result of becoming entangled in fishing lines.

Although there have been no documented accounts, the potential exists for sea otters to get caught and drown in finfish traps as the traps are typically baited with squid and crab, both of which are sea otter prey items. Experiments conducted at the Monterey Bay Aquarium demonstrated that sea otters entered fish traps where they could become trapped (Hatfield and Estes 2000). However, the Fish and Game Commission recently passed a regulation (Section 180.4, Title 14, CCR), effective January 2002, that the entrance tunnels of finfish traps used between Point Arguello, Santa Barbara County and Point Montara, San Mateo County, will possess a rigid inside opening of five inches or less to reduce the likelihood of sea otter entanglements.

5.1.9.2 Effects to Marine Turtles

Based on interactions between turtles and fish harvesters occurring throughout the world, incidental catch poses a threat in habitats utilized by these species, including coastal feeding grounds and migratory corridors that exist along the western United States and Mexico. Based on historical interactions, rod-and-reel gear is not expected to result in turtle interactions. All other gear types have the potential to affect turtles, but would be highly unlikely to result in mortality. Studies of threats to sea turtles in other areas have revealed that the primary threats are incidental take in collisions with fishing boats which would continue at former levels in the no project alternative. Various species of turtles are accidentally taken in several commercial and recreational fisheries including: bottom trawls commonly used by shrimp vessels in the Gulf of California, gill-nets, traps, pound nets, haul seines, and beach seines commonly used in inshore and coastal waters of Baja California. It is thought that trawls, tuna purse seines, hook-and-line, driftnets, bottom and surface longlines may kill additional numbers of turtles in different areas of the eastern Pacific. Pollution effects to turtles would continue with the no project alternative.

Olive ridleys have occasionally been killed by gill-nets at current levels and boat impacts as well as cold stunning in Oregon and Washington. The one documented take of an olive ridley turtle in the driftnet fishery originated from eastern Pacific stock. From 1990 to 1997, an annual average of 96 olive ridley turtles were taken by the U.S. tuna purse seine fleet. Green turtles have been observed captured in nearshore gill-nets and longline gear. Loggerhead turtles have been documented “taken” in both longline and the drift gill-net fishery. Stranding data from 1990 to 1999 for California indicate an average of 2.1 loggerhead turtles strandings per year.

Entanglement and ingestion of marine debris, including abandoned nets, continue to pose a threat to leatherbacks, which seem to have a talent for seeking out and getting tangled in floating lines. However, no documentation exists on interaction of leatherbacks with the fishery being managed by the NFMP. The fishing gear that leatherback turtles may encounter in the nearshore area include trap, rod-and-reel, vertical set line, horizontal set line, and stick gear. At present, no significant take of sea turtles is known to occur as a result of those fishing activities occurring in the areas managed under the NFMP.

5.1.9.3 Effects to Listed Fishes

There currently is a fishery for salmon in the area managed by the NFMP which would continue with the no project alternative. The no project alternative could reduce the numbers of rockfish available as prey items to adult salmon, as fishing activities would continue at current levels. Chinook salmon take is mitigated by timing the open season to avoid, to the maximum extent possible, when the listed runs would be in the ocean. Steelhead normally are fished in freshwater streams and are not authorized to be taken in ocean waters. Coho salmon also may not be taken in ocean waters, however, these two species have the potential to be incidentally caught and then released with unknown effects to survival. There is no fishery for tidewater goby as it is a very small fish with no known market value. Effects of pollution on these species will continue with the no project alternative. Effects to the 19 nearshore finfish could continue by those participants in the salmon fishery that incidentally take rockfish.

5.1.9.4 Effects to Marine and Coastal Birds

Seabirds can be affected by a wide variety of factors including human disturbance, changes in key prey species, oil spills, toxic contaminants, fishery interactions, predation, and changes in climatic conditions. Unfortunately, there are many informational voids concerning seabird ecology, especially winter ecology, which makes it difficult to determine if a particular fishery is having a negative effect on a seabird population. Population monitoring has been conducted for some species that nest on cliffs and flat ground (e.g., California brown pelican, cormorants, common murres, California least tern) and for crevice dwelling species (e.g., Xantus' murrelets, storm-petrels, auklets, pigeon guillemots), but the data are not complete or uniform for all seabird breeding colonies throughout the state. Information concerning fishery interactions is, for the most part, anecdotal and difficult to quantify. Food habit data and the relationship to changes in key prey species are not well known, nor are the effects of environmental changes. This lack of information makes an analysis of whether fishery management practices are having a potentially significant adverse impact on seabirds difficult.

Under the no project alternative, existing management of the nearshore fishery for the 19 species contained in this plan would continue. Nearshore species are caught by commercial fishermen utilizing hook-and-line, trap gear, and set gill and trammel nets, and by recreational anglers fishing from CPFV's, private boats, or from shore, utilizing hook-and-line gear. Because fishing for nearshore species takes place throughout the state, the potential exists for inadvertent interactions with a number of seabird species. Interactions will differ among the individual species and will depend on habitat use by the species (i.e., whether interactions occur adjacent to foraging, roosting, or breeding areas).

There are documented interactions between the large mesh set gill-net fishery and the double-crested cormorant and common loon in California (Julian and Beeson 1998, Forney et al. 2001). However, the set gill-net fishery primarily targets halibut, which accounted for 72 and 85 percent of the total gill-net sets for fishing years 1998 to 1999 and 1999 to 2000, respectively (CDFG unpublished data). Set gill-nets also target "rockfish," which may include some species managed by the NFMP. However,

there is no directed set gill-net effort for the NFMP species. In addition, the number of "rockfish" sets represents a small component of the set gill-net fishery, accounting for 7 percent and 1.5 percent of the total set gill-net sets for the same years discussed above (CDFG unpublished data). In September 2000, the Director of Fish and Game ordered a prohibition of gill and trammel net fishing in several areas within central California for waters less than 60 fathoms deep citing concerns for the common murre and southern sea otters. The closure was in effect for 120 days and was extended, but it has since lapsed. The Department is currently working on regulations to limit all set gill and trammel net fishing from Pt. Reyes to Pt. Arguello to 60 fathoms or greater. Unlike marine mammals, there is no identified acceptable level of seabird bycatch from fisheries that have been established by the federal government that manages listed species. However, the percentage of "rockfish" sets is low, and with the new gill-net closures, seabird mortality will substantially decrease.

Several species of marine and coastal birds, such as: California brown pelicans, California least terns, double-crested cormorants, and marbled murrelets are known to interact with nearshore fishing activities involving various hook-and-line gear, including longline. The attraction of these species to bait and/or chum used in the fisheries can result in seabirds being hooked or entangled in fishing line, which can lead to serious injury and/or death. Evidence of entanglement by these gear types is known for the recreational fishery, and may occur in the commercial fishery. A CPFV observer program in 2001 in San Diego County documented hooking of brown pelicans, California least terns, and double-crested cormorants (DFG, unpublished data). On one-third of these trips, rockfish were a targeted species. The central California CPFV observer program, from 1987 to 1998, documented entanglement of brown pelicans (DFG, unpublished data). Statewide CPFV logbook data between 1995 and 1999 indicates seabird interactions occur approximately 35 percent of trips for which this information was recorded. Hooking of brown pelicans and marbled murrelets from recreational fishing along the shoreline also has been documented, particularly at piers (Carter et al. 1995a, International Bird Rescue Research Center, unpublished data). The incidental hooking and entanglement of brown pelicans at the Santa Cruz wharf in the summer and fall of 2001 resulted in the rescue of over 170 birds, 40 of which subsequently died or were euthanized due to severity of injuries (International Bird Rescue Research Center, unpublished data). While many of the sport fishers were targeting bait fish, rockfish could have been a targeted species.

Seabirds may interact with the live fish trap gear, but it is undocumented and much less likely to occur than with hook-and-line gear due to the fishing techniques employed. However, they are affected by ancillary fishing activities (e.g., vessel proximity, motor noise, generators, lights, radios, etc.) near roosting and breeding sites. Research has shown that many seabird species are disturbed by events which are out of the ordinary (Manuwal 1978, Anderson and Keith 1980, Carney and Sydeman 1999). This includes not only direct human disturbance, but loud noises. Disturbances at brown pelican and double-crested cormorant colonies are known to cause nest abandonment and increased egg predation (Ellison and Cleary 1978, Anderson 1988).

The nesting abundance and distribution of Xantus's murrelet have been correlated with levels of human activities (Keitt 2000). Species which are nocturnal in

their foraging or breeding activities (including Xantus's murrelet, ashy storm-petrel, black storm-petrel, fork-tailed storm-petrel, and rhinoceros auklet) could be taken in flight by striking the nearshore fishing vessels. Particularly at night, seabird disorientation and attraction to artificial lighting can result in direct mortality or result in birds either falling stunned and/or injured into the water or landing on deck. Artificial lights close to colony sites can alter the behavior of these species and increase predation rates. There are documented interactions in the Channel Islands of Xantus's murrelet and ashy storm-petrel being attracted to lighted vessels (Paul Kelly, Gerry McChesney, and Maura Naughton, pers. comm.).

Finfish, particularly rockfish, are eaten by a number of seabirds. Most research on the diets of seabirds in California comes from studies at breeding colonies, with much less known about winter diets. The longest time-series data on seabird diets in California comes from studies at Southeast Farallon Island in central California. These studies indicate that juvenile rockfish is the primary or one of the major prey items of several breeding seabirds. Listed and SSC species which include juvenile rockfish in their diets are double-crested cormorant, marbled murrelet, Xantus's murrelet, rhinoceros auklet, and tufted puffin (Cogswell 1977, Hunt et al. 1979, Ainley et al. 1981, Ainley et al. 1990, Sydeman et al. 1997,). The percentage of rockfish in their diets varies from year to year, but when rockfish are abundant, juvenile rockfish are a more common prey item in their diets (Sydeman et al. In press).

Studies on chick diet composition of these species show a decline in rockfish use in the 1990s, while prior to 1989 (except in El Niño years), the primary prey fed to chicks was young-of-the-year rockfish (Sydeman et al. In press). Near the end of the summer, several species are known to switch to other prey types, possibly explained by the lowering availability of juvenile rockfish as they settle to the ocean floor (Ainley et al. 1990). Although these studies are not able to identify the actual species of rockfish consumed, rhinoceros auklets are known to consume blue rockfish (included in the NFMP), but also feed on widow and yellowtail rockfish (PRBO, unpublished data). Short-bellied rockfish, which is not a nearshore rockfish and not covered by the NFMP, is the most common species identified in seabird diet studies (Ainley et al. 1990, Sydeman et al. 1997). The predominance of short-belly rockfish in seabird diets mirrors its availability as determined by young-of-the-year rockfish midwater trawls (NMFS 2001). While we know that juvenile rockfish are consumed by seabirds, more research is needed to determine the total number of nearshore rockfish covered by the NFMP that are consumed by seabirds and to determine whether the nearshore fishery limits their prey availability.

5.1.10 Effects to Non-Listed Species

5.1.10.1 Effects to Marine Mammals

Although common bottlenose dolphins and gray whales may be susceptible to nearshore fishery interactions due to their association with coastal habitat, there are no documented interactions between cetaceans and the CPFV and finfish live-trap, or hook-and-line fisheries. The take of dolphins and porpoises will continue under the no project alternative, as no changes to fishing methods will occur, and ghost fishing of

abandoned/lost gear will continue.

Strandings data have also indicated that northern elephant seals interact (reported injuries) with hook-and-line gear and a portion of these interactions may be attributed to gear used in the nearshore fishery. Pacific harbor seals are known to interact with CPFV and hook-and-line fisheries, and a portion of these interactions may be attributed to gear used in the nearshore fishery as well. The true degree of interaction is unknown, but NMFS estimated that four harbor seals die annually from unknown hook-and-line related fishery interactions. Since strandings data are considered a gross under-estimator of injury, mortality numbers are likely higher (Forney et al. 2000). California sea lions also interact with CPFV's, finfish live-trap, and hook-and-line (including longline) fisheries, but the true degree of interaction is unknown. However, the total fishery mortality and serious injury for each of these stocks is less than their PBR (Forney et al. 2000).

5.1.10.2 Effects to Marine and Coastal Birds

Under the no project alternative, existing management by the Commission and Council, of the nearshore fishery for the 19 species contained in this plan, would continue. Nearshore species are caught by commercial fishers utilizing hook-and-line, trap gear, and set gill and trammel nets, and by recreational anglers fishing from CPFVs, private boats, or from shore, utilizing hook-and-line gear. Because fishing for nearshore species takes place throughout the state, the potential exists for inadvertent interactions with a number of seabird species. Interactions will differ among the individual species and will depend on habitat use by the species (i.e., whether interactions occur adjacent to foraging, roosting, or breeding areas).

There are documented interactions between the large mesh set gill-net fishery and common murre, pelagic cormorant, Brandt's cormorant, Pacific loon, and western grebe in California (Julian and Beeson 1998, Forney et al. 2001). However, the set gill-net fishery primarily targets halibut, which accounted for 72 and 85 percent of the total gill-net sets for fishing years 1998 to 1999 and 1999 to 2000, respectively (CDFG unpublished data). Set gill-nets also target "rockfish," which may include some species managed by the NFMP. However, there is no directed set gill-net effort for the NFMP species. In addition, the number of "rockfish" sets represents a small component of the set gill-net fishery, accounting for 7 percent and 1.5 percent of the total set gill-net sets for the same years discussed above (CDFG unpublished data). In September 2000, the Director of Fish and Game ordered a prohibition of gill and trammel net fishing in several areas within central California for waters less than 60 fathoms deep, prompted by concerns for common murres and for southern sea otters. (Carretta 2000). The closure was in effect for 120 days and was extended, but it has since lapsed. The Department is currently working on regulations to limit all set gill and trammel net fishing from Pt. Reyes to Pt. Arguello to 60 fathoms or greater. Unlike marine mammals, there is no identified acceptable level of seabird by catch from fisheries. However, the percentage of "rockfish" sets is low, and with the new gill-net closures, seabird mortality will substantially decrease.

Several species of marine and coastal birds are known to interact with nearshore fishing activities involving various hook-and-line gear, including longline. The attraction

of these species, particularly of gulls and terns to bait and/or chum used in the fisheries, can result in seabirds being hooked or entangled in fishing line, which can lead to serious injury and/or death. Evidence of entanglement by these gear types is known for the recreational fishery, and may occur in the commercial fishery. A CPFV observer program in 2001 in San Diego County documented hooking of western gull, Heermann's gull, and Forster's tern (DFG, unpublished data). On one third of these trips, rockfish were a targeted species. The central California CPFV observer program, from 1987 to 1998, documented entanglement of common murres (DFG, unpublished data). Statewide CPFV logbook data between 1995 and 1999 indicate seabird interactions occur on about 35 percent of trips for which this information was recorded. In 1998, Point Reyes Bird Observatory (unpublished data) documented hooking of western gulls, pigeon guillemots, unidentified cormorant species, and unidentified alcid species by rockfish and lingcod longline vessels near the Farallon Islands. Other species which may interact with longlines include Pacific loon, and western grebe.

Seabirds may interact with the live fish trap gear, but it is undocumented and much less likely to occur than with hook-and-line gear due to the fishing techniques employed. However, they are affected by ancillary fishing activities (e.g., vessel proximity, motor noise, generators, lights, radios, etc.) near roosting and breeding sites. Research has shown that many seabird species are disturbed by events which are out of the ordinary (Manuwal 1978, Anderson and Keith 1980, Carney and Sydeman 1999). This includes not only direct human disturbance, but loud noises. For example, pigeon guillemots are known to readily abandon nests if disturbed near their breeding sites (Sowls et al. 1980). There is documentation to show that vessels used in the nearshore live trap fishery are disturbing nesting common murres and Brandt's cormorants at the Hurricane/Castle Rock in Monterey County, and at the colonies at Point Reyes, Marin County (and possibly other areas) (Parker et al. 1999, 2000; Rojek and Parker 2000). One observed boat disturbance at a monitored common murre sub-colony in 1999 resulted in the loss of common murre chicks and eggs and a 12 percent reduction in that year's breeding success (FWS, unpublished data). Similar disturbance patterns are likely to exist at other nesting colonies.

Finfish, particularly rockfish, are eaten by a number of seabirds. Most research on the diets of seabirds in California comes from studies at breeding colonies, with much less known about winter diets. The longest time-series data on seabird diets in California comes from studies at Southeast Farallon Island in central California. These studies indicate that juvenile rockfish is the primary or one of the major prey items of several breeding seabirds including Brandt's cormorant, pelagic cormorant, western gull, common murre, and pigeon guillemot, and included in smaller numbers in the diets of several other species (Ainley et al. 1981, Ainley et al. 1990, Sydeman et al. 1997, Nur and Sydeman 1999, Sydeman et al. In press). The percentage of rockfish in their diets varies from year to year, but when rockfish are abundant, juvenile rockfish are the most common prey item in their diets (Sydeman et al. In press).

Studies on chick diet composition of these species show a decline in rockfish use in the 1990s, while prior to 1989 (except in El Niño years), the primary prey fed to chicks was young-of-the-year rockfish (Sydeman et al. In press). Migrating species, such as sooty shearwaters, also consume juvenile rockfish. Near the end of the

summer, both the breeding and migrating species are known to switch to other prey types, possibly explained by the lowering availability of juvenile rockfish as they settle closer to the ocean floor (Ainley et al. 1990). Although these studies are not able to identify the actual species of rockfish consumed, pigeon guillemots are known to consume blue and black rockfish (both included in the NFMP), but also feed on short-belly, canary, and yellowtail rockfish (Follett and Ainley 1976). Short-bellied rockfish, which is not a nearshore species and not covered by the NFMP, is the most common species identified in seabird diet studies (Ainley et al. 1990, Sydeman et al. 1997). The predominance of short-belly rockfish in seabird diets mirrors its availability as determined by young-of-the-year rockfish midwater trawls (NMFS 2001). While we know that juvenile rockfish are consumed by seabirds, more research is needed to determine the total number of nearshore rockfish covered by the NFMP that are consumed by seabirds and to determine whether the nearshore fishery limits their prey availability.

5.1.11 Effects to Target Fishes in this NFMP

Fish would continue to be exposed to various pollutants throughout the coastal areas. They also would continue to be incidentally taken in other fisheries. Use of hard-bottom habitats could change depending on the amount of change to those habitats due to crushing, breakage by anchors or nets, removal, and or burial or prey by resuspended sediments. OYs and MSYs would continue to be determined by the Council until such time as they are transferred to State management. The Commission could retain the current OYs and MSYs or change them based on the most current commercial data available and therefore, current fishing activity would continue with the no project alternative.

Fishing effort could increase with the no project alternative as more time and effort by both the commercial and recreational sector is allocated to catch the diminishing fish populations. This potential increase in effort may increase effects to the physical and biological environment with the no project alternative. With the no project alternative, CPFV may have to increase the length of trips to find fish and or delete trips due to decreases in fish populations. Effects to biological and physical habitats could either increase or decrease depending on the effort manifested due to decreasing fish populations. Fishing success may be adversely affected for up to 10 days following seismic surveys for oil and gas exploration. The decline in fishing success due to behavioral response and may be experienced as far as 10 km from the survey area (MMS 2001). Exploration and development of undeveloped federal leases would continue to have a potential effect on nearshore fishes and their prey species and would continue with the no project alternative.

5.1.12 Effects to Land Use

Development activities within watersheds and in coastal marine areas often affect habitat of groundfish and other fish species on both long-term and short-term scales. Runoff from development sites of toxics reduces the quality and quantity of suitable fish habitat by the introduction of pesticides, fertilizers, petrochemicals, and construction chemicals. Sediment runoff can restrict tidal flows and tidal elevations

resulting in losses of important fauna and flora. Shoreline stabilization projects that affect reflective wave energy can impede or accelerate natural movements of sand, thereby impacting intertidal and sub-tidal habitats (PFMC 1998). Continue development pressure on coastal areas would continue with the no project alternative.

5.1.13 Effects to Transportation

No additional changes to circulation patterns or transportation corridors are expected with the no project alternative.

5.1.14 Effects to Noise

No additional changes to noise levels are expected with the no project alternative.

5.1.15 Effects to Utilities

No additional changes to utility usage are expected with the no project alternative.

5.1.16 Effects to Archaeology/Paleontology

No additional changes to archaeology are expected with the no project alternative as most fishers would prefer to avoid shipwrecks and the potential for losing or damaging their gear.

5.2 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, 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 many fold 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. This 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 is 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 geographic resolution to address localized overfishing that may be linked to the continuation of the sale of nearshore finfish fishery, however, sufficient information may be available under Stage III conditions.

This alternative would eliminate much of the hook and line fishery adjacent to and in kelp beds where the majority of live finfish are taken. This would reduce the impacts to kelp beds from gear interactions. This defacto MPA (from commercial live fish fishery) would have the potential to increase fish species diversity and density over

the long-term. Coastal and benthic habitats would benefit due to decreases in gear interactions, pollutant discharges (plastics, diesel, garbage, etc.), and bycatch discards of fish and invertebrates. Zonal depletion of local areas should decrease with this alternative. Effects to the environment would be reduced with the implementation of this alternative. However, implementation of this alternative alone would not meet most of the fundamental goals of the NFMP or the MLMA. Compared to the proposed project, the effects to the environment form this alternative have the potential to be decreased.

5.3 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 eliminated. 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. Environmental effects to benthic habitats would be reduced due to decreased efficiency and potentially fewer participants in the fishery. However, should the fleet not be decreased to match the available fish biomass, fishing effort could increase to make up for the loss of efficiency and thereby, potential environmental impacts could proportionally increase. This alternative would not meet the mandates of MLMA of providing for sustainability while encouraging both commercial and recreational fishing opportunities.

5.4 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. This alternative

would provide for less localized management of fish harvesting rates and thereby, environmental effects could increase before the components of the NFMP are implemented to reverse potential adverse effects to the environment. Compared to the proposed project, the effects to the environment from this alternative have the potential to increase.

5.5 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 from the Oregon border to Cape Mendocino, 2) North-Central Coast from Cape Mendocino to Point Año Nuevo, 3) South-Central Coast from Point Año Nuevo to Point Conception, and 4) South Coast from 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 the bull kelp, and few fishers from the Monterey port complex fish north of Año Nuevo. This alternative would increase localized control over harvest rates and be more likely to ensure that components of the NFMP are implemented before effects to the environment occur. Compared to the proposed project, the effects to the environment from this alternative have the potential to be similar.

5.6 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 optimum yield 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 done by region and be based on the stock biomass information for each region.

This alternative 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 more 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 knowledge. This alternative allows increased fishing by the recreational sector when biomass is low (higher, less efficience taking methods). This has the potential to increase damage to biological habitat due to increased gear disruption of marine flora. It also could lead to localized depletion of targeted fish species since more people would be fishing in areas targeted by recreational fishers. Effects to coastal habitats and target fish species could increase beyond those of the proposed project. Compared to the proposed project, the effects to the environment from this alternative have the potential to be increased.

5.7 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 alternatives to allocation of 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. This alternative is primarily economically based and environmental effects would vary depending upon which sector is allocated the higher catch volume. Both recreational and commercial fish participants have adverse effects on marine flora (removing kelp with hooks and/or anchors), potentially deplete localized fish populations through heavy fishing of an area, or increasing bycatch of unwanted finfish species. Compared to the proposed project, the effects to the environment from this alternative have the potential to be similar.

5.8 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 that 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, and 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. This alternative would decrease environmental effects to coastal and benthic habitats due to decreased numbers of participants. Localized depletion of nearshore finfish would be less likely and potentially increasing the numbers of fish available to provide for recruitment. There would not be an increase in the commercial fleet and the environmental effects due to that fishery would decrease. Compared to the proposed project, the effects to the environment from this alternative have the potential to be decreased.

5.9 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) 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 program, 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 also could be considered. Action by the Council would be required to establish separate OYs by geographic region for nearshore rockfish in order to accomplish this. When the OY has been reached in a particular region, all commercial fishing for nearshore species whose OY has been reached would cease. This could reduce the overall take of nearshore finfish if further reductions were included and the commercial fleet allocation is not redirected to the recreational sector.

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 program 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.

A review of commercial fisheries landing data for the year 2000 suggests that trap and vertical longline (stick gear) gear used in the nearshore finfish fishery are very effective in selecting for cabezon, kelp greenling, and California sheephead. Removing this gear may affect population dynamics when certain individuals are no longer selected for in a fishery. An increase in the number of cabezon and kelp greenling in a reef area could negatively affect those species they prey upon. Conversely, species that feed on cabezon would be positively affected. This also could decrease the ability of commercial fisher participants to "fish out" an area. Elimination of traps would decrease the bycatch of invertebrates inadvertently caught in traps and the physical damage to benthic habitats from trap placement and retrieval. Therefore, this alternative could decrease environmental effects to habitats and species. Compared to the proposed project, the effects to the environment from this alternative have the potential to be decreased.

5.10 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 also 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 participant wants to switch tiers, it would need

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. This alternative increase the local management of fish harvesting and allow the implementation of NFMP components to decrease the likelihood of environmental impacts. In addition, there is a high probability that the participants in the fishery would be reduced with this alternative which would further reduce environmental impacts. Compared to the proposed project, the effects to the environment from this alternative have the potential to be decreased.

5.11 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 also 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 participants from other fisheries look for alternative fisheries. Additional CPFVs entering the fishery could negatively affect the economic viability of the existing fleet. This alternative will benefit the environment by not authorizing an increase in fishery participants. There would not be an increase in effects to coastal or benthic habitats as fishing vessel numbers would be capped at the selected control date until such time that the Commission or Council determines that the fishery will sustain an increase in participants. There would be no increase in the pressure exerted on the 19 nearshore finfish with a cap on vessels so the decline in fish populations should not continue. Compared to the proposed project, the effects to the environment from this alternative have the potential to be similar

5.12 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 fishermen 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. This alternative is an economic alternative and not accomplish the goals and objectives of the MLMA. Compared to the proposed project, the effects to the environment from this alternative have the potential to be similar.

5.13 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 fisher's catch. A set weight limit is easier for the participants 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 a participants 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. This alternative would reduce the environmental effects on the nearshore finfish populations. It has the potential to provide for more spawning aged fish which in turn provide increased recruitment into the ecosystem. Fishing time could be reduced as the bycatch could be retained and a decrease in damage to the benthic habitat result. Reduced fishing time provides for the minimization of potential gear interaction with pelagic or coastal species. Compared to the proposed project, the effects to the environment from this alternative have the potential to be decreased.

5.14 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 catching their share (as this would reduce their profits). Lastly, this system fosters a sense of resource stewardship in the fishing share holder, 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 permittee'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. This alternative will only reduce the environmental impacts from the commercial fleet and not change impacts from the recreational participants. Fishers could time their harvest activities around favorable market conditions, and would have no incentives to overcapitalize fishing operations. This system fosters a sense of resource stewardship in the fishing share holder, treating the resource as their investment with dividends accruing to them

from conservation practices. Therefore, effects to the environment should be reduced as the participants have an increased stake in maintaining and improving the habitat for their targeted fish species. Increased stewardship most always results in increased habitat value due to better self monitoring and awareness to reduce environmental damaging practices. Compared to the proposed project, the effects to the environment from this alternative have the potential to be similar.