

Chapter 4. Environmental Consequences of the Proposed Project

4.1 Proposed Project

Consistent with CEQA and the Commission's certified regulatory program, this Chapter addresses whether implementation of the proposed project could result in a significant or potentially significant environmental impact under CEQA. The MSFMP options, which will be used by the Commission for the conservation and management of the fishery, are described in Chapter 2 of this document and in further detail in Section 1, Chapter 3 of the MSFMP. Whether implementation of the proposed project will result in potentially significant impacts under CEQA, is a function of potential impacts due to implementation of the various options.

The proposed project (preferred alternative) is comprised of options from the fishery control rules, restricted access and ecological concerns components. The restricted access options (H3, I1, K3, L3, M3, and M4) in conjunction with the fishery control rule option (A2) and status quo weekend closures are designed to prevent an overfished condition from occurring because it disbursts the take of market squid throughout the season and allows spawning to take place throughout the season. The ecological concerns option R4 establishes an area and time closure for squid vessels fishing for squid using attracting lights around Anacapa and Santa Barbara islands from 1 February through 30 September. This seabird area closure would be 1 nautical mile from the high water mark for these islands and would exclude the Channel Island MPAs implemented in April 2003, because no commercial squid fishing is presently allowed in these areas. The seabird closure is intended to offset some of the negative impacts of light pollution at seabird rookeries for 12 seabird species (including one endangered, one candidate/threatened, and three other SSC) during their breeding seasons. Option Q3 establishes an area closed to squid fishing in all waters north of Pillar Point at any time. The creation of this squid harvest replenishment/general habitat closure area is intended to prevent squid fishery interactions in an area that has not been traditionally utilized for commercial squid fishing and where there is the potential for interactions with non-target species such as fish, sea turtles, seabirds, and marine mammals. This option would create a forage reserve for fish, sea turtles, seabirds, marine mammals, and other marine species that consume squid in the northern half of the state. Additionally, it would provide areas of uninterrupted spawning for market squid.

In Section 1 of the MSFMP, some proposed project options also are status quo options (e.g., C2, D1, F1, G1). Some of these options are current regulations (e.g., D1, F1, G1) put in place until a fishery management plan for market squid could be developed and adopted. These interim regulations will be superseded by the adoption of the MSFMP. Because the Department recommends continuing these existing market squid regulations while adding new restrictions to the fishery, they are part of the MSFMP's proposed project. However, for purposes of CEQA analyses, these existing regulations are not discussed in this chapter as they reflect the pre-project status quo. A discussion of the status quo options can be found in Chapter 5 of this ED.



Effects to the Physical Environment

4.1.1 Effects to Air Quality

Impacts on air quality are considered significant if the project causes or contributes to a violation of the federal or California ambient air quality standards and/or exposes sensitive receptors to substantial pollutant concentrations.

Major source of air pollutants under the proposed MSFMP would be fishing vessel exhaust and activities associated with fish processing businesses, including related vehicle trips. In this regard, sources of air emissions are generally the same for the proposed project as currently exist in the status quo market squid fishery. Managing the fishery under the proposed project is not likely to change air quality from present conditions. Implementing the proposed fishery control rules and restricted access options reduces the number of vessels fishing for squid but it does not necessarily reduce fishing effort as the remaining vessels make up for the market demand, thus, effort is not likely to be reduced from the status quo. The proposed permit transfer options could improve air quality as new less polluting more efficient vessels would replace the old ones. However, this change would be incremental. Seabird time and area closures around Anacapa and Santa Barbara islands should eliminate air quality impacts from market squid vessels in the closed areas, but the vessels are likely to fish elsewhere, so from a regional perspective, air quality effects should be the same as current levels. The squid harvest replenishment/general habitat closure area option should eliminate air quality impacts from market squid vessels in waters north of Pillar Point, so air quality impacts in that area may be slightly reduced. However, the vessels are likely to fish elsewhere, so from a broader regional perspective, air quality effects are likely to be the same as current levels. Thus, air quality impacts resulting from the proposed project, as a consequence, are not expected to change or adversely affect existing air quality conditions or the overall amount of emissions associated with current fishing activities. In this respect, air quality impacts that might result from implementation of the proposed project are expected to be less than significant. Finally, significant impacts on air quality are not expected from the combined effects of the individual project options because implementation of the proposed MSFMP will benefit natural resources held in trust for the people of California when compared to existing conditions.

4.1.2 Effects to Water Quality

Water quality impacts are considered significant if the project causes or contributes to the violation of water quality standards, criteria, or waste discharge requirements, and substantially degrade water quality such that acute toxicity results.

While effects to water quality will occur with the proposed project, they are not expected to exceed current levels (e.g., discharges of oily bilge water, squid inks and separation waters, re-suspension of bottom sediments, refuse and sanitary waste dumping, and sloughing of bottom paint into water). Managing the fishery under the proposed project



is not likely to change water quality from present conditions. Implementing the proposed fishery control rules and restricted access options reduces the number of vessels fishing for squid but it does not necessarily reduce fishing effort as the remaining vessels make up for the market demand, thus, effort is not likely to be reduced from the status quo. The proposed permit transfer options could improve water quality as new less polluting more efficient vessels would replace the old ones. However, this change would be incremental. Seabird time and area closures around Anacapa and Santa Barbara islands would eliminate water quality impacts from market squid vessels in the closed area, but the vessels are likely to fish elsewhere, so from a regional perspective, water quality effects should be the same as current levels. The squid harvest replenishment/general habitat closure area option should eliminate water quality impacts from market squid vessels in waters north of Pillar Point, so water quality impacts in that area may be slightly reduced. However, the vessels are likely to fish elsewhere, so from a broader regional perspective, water quality effects are likely to be the same as current levels. Thus, water quality impacts resulting from the proposed project, as a consequence, are not expected to change or adversely affect existing water quality conditions. Therefore, effects on water quality from implementation of the proposed project are expected to be less than significant. Finally, significant impacts on water quality are not expected from the combined effects of the individual project options because implementation of the proposed MSFMP will benefit natural resources held in trust for the people of California when compared to existing conditions.

4.1.3 Effects to Geology

Impacts on geological resources are considered significant if the project results in changes to unique geological features that are not reversible, or contributes to, or triggers, or accelerates, any geological processes such as erosion or marine landslides. Effects to geology are not expected to occur with the proposed project, as fishing for squid takes place over nearshore sandy bottom areas where squid deposit their egg cases. Implementing the proposed fishery control rules and restricted access options functions to decrease the number of vessels fishing for squid, but it does not necessarily reduce fishing effort as the remaining vessels make up for the market demand, thus, effort is not likely to be reduced from the status quo. Impacts on geological resources resulting from the proposed project are not expected to exceed current levels. Therefore, effects on geological resources from implementation of the proposed project are expected to be less than significant. Finally, significant impacts on geological resources are not expected from the combined effects of the individual project options because implementation of the proposed MSFMP will benefit natural resources held in trust for the people of California when compared to existing conditions.

4.1.4 Effect to Physical Oceanography

Impacts on physical oceanography are considered significant if the project results in substantial changes in currents, dissolved oxygen, salinity, temperature, or upwelling. For purposes of these significance criteria, project-related changes in physical



oceanographic conditions are considered substantial where such changes exceed the range of normal variability of identified physical parameters.

There are no known fishing activities, in the proposed project, that have the potential to change salinity, currents, dissolved oxygen, or temperature. The same is true of reasonably foreseeable activities under the proposed MSFMP. In this regard, effects from implementation of the proposed project are not expected to result in significant impacts on physical oceanography.

Effects to the Biological Environment

4.1.5 Effects to Coastal Habitat

Impacts on coastal habitat are considered significant if the project results in a substantial adverse effect, including through habitat modification, on any species identified as a candidate, sensitive, or special status species, or if the project results in a substantial adverse effect on any sensitive natural community, interferes substantially with the movement of any native resident or migratory fish or wildlife species, or impedes the use of native nursery sites, such as estuaries. Significant effects also would occur if the project results in a measurable change in regional species composition, ecological function, or community structure. Finally, a significant effect would result if the project would reduce the number or restrict the range of an endangered, rare, or threatened species as defined by CCR Title 14 §15380. For purposes of these significance criteria, project related changes are substantial where such changes result in a measurable decline in the aforementioned parameters beyond normal variability in the localized area.

In general, fishing activities associated with implementation of the proposed project that could adversely affect coastal habitats include: discharge of pollutants, physical disturbance of bottom sediments and benthic flora and fauna due to anchoring and net placement, physical displacement and/or disturbance of listed species from their respective habitats, and through the removal of market squid as prey for fish, sea turtles, seabirds, and marine mammals. However, these effects and disturbances are not unique to the proposed project. They currently exist and occur as a result of present and ongoing fishing activities in the market squid fishery and similar effects are expected to occur with adoption of the proposed project. For example; fishing activities will continue in the market squid fishery with the same gear currently used.

Implementing the proposed project is not expected to increase impacts to coastal habitat beyond those associated with current fishing activities. Implementing the proposed fishery control rules and restricted access options will reduce the number of vessels but not necessarily the effort as the remaining vessels would make up for the market demand. The proposed permit transfer options could improve water quality in the coastal zone as new less polluting more efficient vessels would replace the old ones. However, this change would be incremental. Consequently, project related



effects on coastal habitat from the implementation of these options are expected to be less than significant.

Implementation of the seabird time and area closures and the squid harvest replenishment /general habitat closure area option would reduce current disturbances to seabird species in the Channel Islands and at the Farallon Islands. Artificial night-lighting can be a problem for several seabird species that are nocturnal in colony or foraging habits. The concern over the potential impacts of artificial lights on seabirds in the Channel Islands arose in 1999 when large increases in artificial light intensity levels associated with night-time squid fishery boat activity extended throughout the seabird breeding season. Breeding seabirds in California susceptible to inflight strikes include Xantus's murrelet, Cassin's auklet, rhinoceros auklet, all of the storm-petrel species (ashy, black, fork-tailed, and Leach's), and the fledgling chicks of tufted puffins. Additionally, California brown pelicans, cormorants, and other seabirds are affected by the ancillary fishing activities. (e.g., vessel proximity, motor noise, generators, lights, human voices, seal bombs, gunshots, radios) of the market squid fishery near roosting and breeding sites. Personnel from the CINPS have reported squid boats fishing as close as 75 to 450 feet (< 1/8 mile) from Anacapa Island, and as many as 12 boats at one time. In 2003, squid vessels harvested more squid north of their traditional Monterey fishing grounds than the past 12-year average. In 2003, squid landed in the vicinity of the Farallon Islands increased a 1,000 times more than the previous 12-year average.

Implementation of the proposed project would establish area and time closure for fishing for squid using attracting lights around Anacapa and Santa Barbara islands from 1 February through 30 September. This area closure would be 1 nautical mile from the high water mark for these islands. Implementation of seabird time and area closures around Anacapa and Santa Barbara islands may result in shift of fishing activities for the southern market squid fleet. However, the closed areas represent less than 1 percent of the squid fishing effort during the closed area time frame over the past 2 years and less than 3 percent over the past 8 years (based on data from landings), so the shift in effort would be considered minimal. Prohibiting the use of attractant lights at these islands would likely compel squid vessels to fish in other locations. Implementation of the squid harvest replenishment/general habitat closure area in all waters north of Pillar Point may also result in a shift of fishing activities for the northern California market squid fleet. However, prior to 2003, the area proposed for closure was not typically fished for market squid. Landings from the closed area represented less than 6 percent of the 12-year average of the northern fleet's landings (based on years 1990 to 2002). Finally, significant impacts on coastal habitat are not expected from the combined effects of the individual project options because implementation of the proposed MSFMP will benefit natural resources held in trust for the people of California when compared to existing conditions.

4.1.6 Effects to Benthic Habitat



Impacts on benthic habitat are considered significant if the project results in a substantial adverse effect, including through habitat modification, on any species identified as a candidate, sensitive, or special status species, or if the project results in a substantial adverse effect on any sensitive natural community, or interferes substantially with the movement of any native resident or migratory fish or wildlife species, or impedes the use of native nursery sites, such as offshore reefs. Significant effects also would occur if the project results in a measurable change in regional species composition, ecological function, or community structure. For purposes of these significance criteria, project-related changes are substantial where such changes result in a measurable decline of the aforementioned parameters beyond normal variability in the localized area.

Physical disturbances to the soft-bottom habitat from implementation of the proposed project are not predicted to cause additional changes in species abundance or composition from existing conditions. Implementation of the proposed project would utilize the same gear as currently exists. Presently, there is concern over the use of chains as a seine weight in the commercial fishery. Chains have the potential of digging deeper into the ocean floor. Net bottoms may also scrape the ocean floor and do harm to squid eggs. However, soft-bottom infauna that may be disturbed by anchoring or net damage are expected to repopulate or recolonize. Currently, purse seine nets used for squid typically do not hang as deep as purse seines used for other species, so contact with the bottom is reduced. Incidental catches of squid eggs and other species increase in the squid fishery when the nets are set in shallower water (less than 22 fathoms), where bottom contact may occur (Lutz and Pendleton 2001). Damage to the substrate, and thus, mortality of squid eggs associated with purse seining for squid has not been quantified.

However, changes are expected to be within the natural variability for the resources and not beyond that which currently occurs. Similar effects are expected to occur with adoption of the proposed project because fishing activities will continue in the market squid fishery with the same gear currently used. Implementing the proposed fishery control rules and restricted access options will reduce the number of vessels but not necessarily the effort as the remaining vessels would make up for the market demand. The proposed permit transfer options could improve water quality above the benthic zone as new less polluting more efficient vessels would replace the old ones. But, this change would be incremental. Implementation of seabird time and area closures around Anacapa and Santa Barbara islands may result in shift of fishing activities for the southern fleet. However, the closed areas represent less than 1 percent of the squid fishing effort during the closed area time frame over the past 2 years and less than 3 percent over the past 8 years, so the shift in effort would be considered minimal. Implementation of the squid harvest replenishment/general habitat closure area in all waters north of Pillar Point may also result in a shift of fishing activities for the northern California market squid fleet. However, prior to 2003, the area proposed for closure was not typically fished for market squid. Landings from the closed area represented less than 6 percent of the 12-year average of the northern fleet's landings (based on years 1990 to 2002), so the shift in effort would be considered minimal. Thus, even with



adoption of the proposed project, the present condition of benthic habitat in and around the market squid fishery is not expected to change relative to existing conditions. Effects on benthic habitat from implementation of the proposed project are expected to be less than significant under CEQA. Finally, significant impacts on benthic habitat are not expected from the combined effects of the individual project options because implementation of the proposed MSFMP will benefit natural resources held in trust for the people of California when compared to existing conditions.

4.1.7 Effects to Pelagic Habitat

Impacts on pelagic habitat are considered significant if the project results in a substantial adverse effect, including through habitat modification, on any species identified as a candidate, sensitive, or special status species, or if the project results in a substantial adverse effect on any sensitive natural community, interferes substantially with the movement of any native resident or migratory fish or wildlife species, or impedes the use of native nursery sites, such as offshore reefs. Significant effects also would occur if the project results in a measurable change in regional species composition, ecological function, or community structure. Finally, a significant effect would result if the project would reduce the number or restrict the range of an endangered, rare, or threatened species as defined by CCR Title 14 §15380. For purposes of these significance criteria, project related changes are substantial where such changes result in a measurable decline in the aforementioned parameters beyond normal variability in the localized area.

In general, fishing and other activities associated with implementation of the proposed project could adversely affect pelagic habitat through discharge of pollutants, and physical displacement of listed species from habitats. These effects, however, are not unique to the proposed project. Instead, the effects currently exist and occur as a result of present and ongoing fishing activities in the market squid fishery, thus, similar effects are expected to continue with adoption of the proposed project because, for example, fishing activities will continue in the market squid fishery with the same gear currently used. Implementing the proposed fishery control rules and restricted access options will reduce the number of vessels but not necessarily the effort as the remaining vessels would make up for the market demand. The proposed permit transfer options could improve water quality in the pelagic zone as new less polluting more efficient vessels would replace the old ones. But, this change would be incremental. Implementation of seabird time and area closures around Anacapa and Santa Barbara islands may result in shift of fishing activities for the southern fleet. However, the closed areas represent less than 1 percent of the squid fishing effort during the closed area time frame over the past 2 years and less than 3 percent over the past 8 years, so the shift in effort would be considered minimal. Implementation of the squid harvest replenishment/general habitat closure area in all waters north of Pillar Point may also result in a shift of fishing activities for the northern California market squid fleet. However, prior to 2003, the area proposed for closure was not typically fished for market squid. Landings from the closed area represented less than 6 percent of the 12-year average of the northern fleet's landings (based on years 1990 to 2002). Thus, even with adoption of the



proposed project, the present condition of pelagic habitat in and around the market squid fishery is not expected to change relative to existing conditions. For the same reason, project-related effects on pelagic habitat are generally expected to be less than significant under CEQA. Finally, significant impacts on pelagic habitat are not expected from the combined effects of the individual project options because implementation of the proposed MSFMP will benefit natural resources held in trust for the people of California when compared to existing conditions.

4.1.8 Effects to Areas of Special Concern

Impacts on areas of special concern are considered significant if the project has a substantial adverse effect on those designated special areas identified in local or regional plans, policies, regulations, or by the Department, USFWS, or NOAA Fisheries. Such effects are substantial where the project would result in the area no longer functioning as a designated special area.

In general, squid fishing and other activities associated with the proposed project could affect areas of special concern. These effects, however, are not unique to the proposed project. Instead, these affects and conditions currently exist in the market squid fishery and occur as a result of fishing and other activities. These activities and effects are expected to continue at the same level even with implementation of the proposed project. For example, fishing activities will continue in the market squid fishery with the same gear currently used. Implementation of the fishery control rules and restricted access components will reduce the number of vessels but not necessarily the effort as the remaining vessels would make up for the market demand. Implementation of seabird time and area closures around Anacapa and Santa Barbara islands may result in shift of fishing activities for the southern fleet. However, the closed areas represent less than 1 percent of the squid fishing effort during the closed area time frame over the past 2 years and less than 3 percent over the past 8 years, so the shift in effort would be considered minimal. Implementation of the squid harvest replenishment/general habitat closure area in all waters north of Pillar Point may also result in a shift of fishing activities for the northern California market squid fleet. However, prior to 2003, the area proposed for closure was not typically fished for market squid. Landings from the closed area represented less than 6 percent of the 12-year average of the northern fleet's landings (based on years 1990 to 2002). For these reasons, project-related effects on areas of special concern are expected to be less than significant under CEQA. Finally, significant impacts on areas of special concern are not expected from the combined effects of the individual project options because implementation of the proposed MSFMP will benefit natural resources held in trust for the people of California when compared to existing conditions.

4.1.9 Effects to Protected, Threatened, and Endangered Species

Impacts on endangered, rare or threatened species, or species otherwise protected by State or federal law, are significant if the project would result in danger of irreparable injury to, or mortality in, any population of any such species where such a change



occurs at a rate that threatens the viability of the population; if the project would impair the recovery of any such species, or where the project has the potential to reduce the number or restrict the range of an endangered, rare, or threatened species as defined by CCR Title 14 §15380; where the project results in an adverse environmental impact on endangered, rare or threatened species, or species otherwise protected by State or federal law, that are individually limited, but cumulatively considerable.

In general, fishing and other activities associated with implementation of the proposed project could affect threatened or endangered species, or species otherwise protected by State or federal law. These effects, however, are not unique to the proposed project. Instead, these effects and conditions currently exist in the market squid fishery and occur as a result of fishing and other activities in the fishery. These activities effects are expected to continue even with implementation of the proposed project. Thus, even with adoption of the proposed project, the present and ongoing effects on threatened and endangered species in and around the market squid fishery are not expected to change relative to existing conditions.

4.1.9.1 Effects to Protected or Listed Marine Mammals

The effects of fishery management decisions on marine mammal populations are typically considered in the context of direct and indirect effects. Direct effects are those where a marine mammal is incidentally taken, seriously injured, or disturbed, as a result of activities associated with the fishery. These would include serious injury or death resulting from entanglement in fishing gear, serious injury or death resulting from interactions with fishing gear, and disturbances that significantly impair essential behavioral patterns including breeding, feeding, or refuge. Indirect effects are those that may be caused by the fishery, but are later in time or farther removed in distance, yet are reasonably foreseeable and causally related. Indirect effects include negatively affecting the marine mammal's prey abundance and availability. NOAA Fisheries's PBR calculation (see Section 3.9.1.1) includes a reduction to account for indirect effects that may have caused the marine mammal stock to be reduced below its OSP (K. Forney pers. comm., Barlow et al. 1995), such as adverse impacts on behavior, reproduction, survival, loss of habitat, prey abundance and availability, or a change in spatial distribution and/or abundance.

Indirect Effects

Market squid are eaten by a number of marine mammals. Their importance in the marine mammal diet varies among species. Squid has been documented as an important dietary component of the sea otter, northern elephant seal, northern fur seal, California sea lion (Lowry and Caretta 1999), Dall's porpoise, Pacific striped dolphin, Risso's dolphin, and toothed whales such as the short-finned pilot whale (Hacker 1992), sperm whale, and bottlenose whale (Fields 1965). The proportion of the diet that squid makes up varies dramatically between species, geographical location, and environmental conditions. Most marine mammals are not squid specialists (squid is rarely the sole prey item) and because of its highly variable abundance squid cannot be relied on as a stable food source, additionally, it has limited energetic value (O'Dor et al.



1986). Therefore, marine mammals must often switch to more abundant or energetically profitable prey species or target squid when they are most abundant during spawning aggregations and minimal energy is needed for capture. For the California sea lion, squid occur in 35 to 44 percent of scat samples collected at rookery sites in the southern California Bight which can represent volumes as high as 27 percent of the diet by weight in non El Niño years and 16 percent in El Niño years (Lowry and Carretta 1999). In terms of prey rank, squid was either the primary or secondary prey item after northern anchovy, depending on location and environmental conditions. During an El Niño event, the presence of market squid in California sea lion and Pacific harbor seal scat samples decreased more than three-fold as compared to non-El Niño periods (Henry 1997, Lowry and Carretta 1999).

Consumption estimates of squid are known for some marine mammals, although these can vary dramatically because squid availability changes with location and environmental conditions. For example, sea lions in southern California have been estimated to consume 68,000 tons of squid in non El Niño years and 30,000 tons in El Niño years (STAR Working Paper 4, Appendix E) [Additional information on landings of squid and the percent frequency of occurrence in sea lions diets can be found in Section 1 of the MSFMP under section 2.1.6]. Dr. William Gilly estimated that three marine mammal species, California sea lion, Dall's porpoise, and Risso's dolphin, consume 125,000 tons of squid annually (pers. comm.). The changing availability of squid also affects potential predators. Short-finned pilot whales increase their consumption of market squid during the squid spawning season. It has been suggested that short-finned pilot whales in the southern California Bight near Santa Catalina Island (Miller et al. 1983 and Dohl et al. 1980) may move inshore as the squid spawning season begins.

In order to assess market squid fishery impacts on marine mammals that consume squid it is necessary to know how much the marine mammal depends on that resource. Although there is documentation detailing consumption of squid by some marine mammal species (described above), it is not possible to estimate the total amount of market squid consumed by all marine mammals in California waters. Thus, at the current time it is not possible to determine the allocation of market squid necessary to sustain marine mammal populations and consequently, makes analysis of whether market squid fishery management practices are having a potentially adverse impact on these species difficult. However, it should be noted that the goal of squid fishery management is to maintain a long-term economically viable fishery that matches the level of effort to the health of the resource, and under MLMA, the Department must consider the ecosystem impacts of the squid fishery, namely the conservation of not only squid, but of the other marine species that depend on squid.

The goals of the MSFMP include ensuring sustainability of the squid resource and the marine life that depends on squid. The restricted access program along with the seasonal catch limit and weekend closures function to disburse the take of market squid throughout the season and allow spawning to take place throughout the season. Additionally, fisheries independent data suggests that squid distribution is widespread



and that fishing does not occur in all areas of distribution and that not all spawning grounds are targeted. Historical evidence from research cruises along the west coast, as well as recent catch data, suggests that squid biomass may be very large at times and distributed widely along the entire west coast. The squid fishery has a monitoring program which assists in management of the squid fishery to achieve sustainability and the squid harvest is monitored through an egg escapement model. Implementation of seabird time and area closures around Anacapa and Santa Barbara islands and the squid harvest replenishment/general habitat closure area in waters north of Pillar Point would benefit marine mammals from an increase in prey species available to marine mammals in the closed areas. This would benefit all marine mammal species in the closed area that prey on squid. The latter option would make half of the state a squid harvest replenishment area. Finally, the effects of removing squid from the ecosystem is not unique to the proposed project as this condition currently exists in the market squid fishery. Removal of squid as prey available to marine mammals is expected to continue even with implementation of the proposed project.

Direct Effects

Implementation of the proposed project could affect listed and marine mammal species of special concern through interaction with fishing gear. These effects, however, are not unique to the proposed project. Instead, these effects and conditions currently exist in the market squid fishery and presently occur as a result of fishing and other activities in the market squid fishery. These activities and effects are expected to continue even with implementation of the proposed project.

In the remote possibility that listed marine mammals are taken in the squid fishery, the take is ultimately governed by NOAA Fisheries. If the take does not exceed the species' PBR, NOAA Fisheries does not consider the take significant as NOAA Fisheries has determined that the loss of marine mammals below the PBR does not adversely affect the population or stock viability. The Department would defer to the governing agency for enforcement. Therefore, while there is a remote possibility for the squid fishery to interact with marine mammals such that mortality results and thereby significant by CEQA definition, NOAA Fisheries has determined that the loss of marine mammals below the PBR does not adversely affect the population or stock viability.

The restricted access options, in conjunction with the fishery control rule options, are designed to prevent an overfished condition by disbursing the take of market squid and allowing spawning to take place throughout the season. These options reduce the number of vessels but not necessarily the effort as the remaining vessels make up for the market demand. The number of bait vessels may increase, but the squid bait fishery is considered a Category III fishery (fisheries with a remote likelihood of marine mammal interaction or no known serious injuries or mortalities with marine mammals) and there is no evidence that listed marine mammals interact with bait vessels. Additionally, the design of the permit transfer system does not allow for increases in the harvesting capability of the fleet. Accordingly, total fishing effort would be equal to or less than current conditions (status quo). Implementation of the harvest replenishment/general habitat closure option would establish areas that are closed to



squid fishing in all waters north of Pillar Point at any time. This would benefit all marine mammal species that interact with squid fishing operations in the closed area.

Given the past absence of squid purse seine fishery interactions, serious injury or mortality, with any of the baleen whale stocks including; humpback whale, northern right whale, sei whale, fin whale, and the blue whale in California waters and the majority of the toothed whales, including the sperm whale, we assume that implementation of the fishery control rule and restricted access components would have an insignificant effect on these cetacean species. There are no reports of squid purse seine fishery interactions, serious injury or mortality, with the Guadalupe fur seal, northern elephant seal, or Steller sea lion stocks, and no reports of squid purse seine interactions with the southern sea otter. Thus, we assume that implementation of these components would have an insignificant effect on these pinniped and fissiped species and is not expected to change relative to existing conditions.

Implementation of seabird time and area closures around Anacapa and Santa Barbara islands and the squid harvest replenishment/general habitat closure area in waters north of Pillar Point would eliminate squid fishery- marine mammal interactions in the closed areas. However, the closed areas could shift squid fishing effort to areas with higher marine mammal populations (e.g. adjacent to pinniped rookeries, haul out sites, foraging areas) particularly at the Channel Islands. Pinniped rookeries are present at several Channel Islands that are subject to disturbance by commercial and recreational fishermen. However, closures have already been enacted to keep fishing boats reasonable distances offshore from the rookeries to minimize interactions and disturbances, particularly during the pupping and breeding season. The proposed closure areas at the Channel Islands represent less than 1 percent of the squid fishing effort during the closed area time frame over the past 2 years and less than 3 percent over the past 8 years, while the proposed closure in northern waters is not an area frequently fished for market squid (at least prior to 2003). Thus, the shift in effort is considered minimal. Therefore, we assume that implementation of the time and area closures of the proposed project would have a less than significant impacts to protected and listed marine mammals and is not expected to change relative to existing conditions. Finally, significant impacts on listed marine mammals are not expected from the combined effects of the individual project options because implementation of the proposed MSFMP will benefit natural resources held in trust for the people of California when compared to existing conditions.

4.1.9.2 Effects to Listed Marine and Coastal Birds (Seabirds)

The effect of fishery management decisions on seabird populations is typically considered in the context of direct and indirect effects. Direct effects are those where a seabird is incidentally injured seriously or killed as a result of activities associated with the fishery. This would include serious injury or death resulting from bycatch or entanglement in fishing gear, serious injury or death resulting from seabirds in flight striking a fishing vessel, and disturbances that significantly impair essential behavioral patterns including breeding, feeding, or sheltering. Indirect effects are those that may



be caused by the fishery, but are later in time or farther removed in distance, yet are reasonably foreseeable and causally related. This includes the reduction of seabird prey abundance and availability.

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 murre, California least tern) and for crevice dwelling species (e.g., Xantus's 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 impact on seabirds difficult.

Indirect Effects

Market squid are eaten by a number of seabirds. Their importance in the seabird diet varies among species. Squid has been documented as an important dietary component of the common murre, ashy storm-petrel, black storm-petrel, fork-tailed storm-petrel and rhinoceros auklet (Morejohn et al. 1978). The proportion of the diet that squid makes up varies dramatically between species, geographical location, and environmental conditions. Most seabird species are not squid specialists (squid is rarely the sole prey item) and because of its highly variable abundance squid cannot be relied on as a stable food source, additionally, it has limited energetic value (O'Dor et al. 1986). Therefore, squid predators often must switch to more abundant or energetically profitable prey species (Ainley et al. 1996, Sydeman et al. 1997), or target squid when they are most abundant during spawning aggregations when minimal energy is needed for capture. For seabirds such as the common murre, squid composes 6 to 20 percent of the diet (by weight) depending on season, and is usually ranked third or fourth after northern anchovy, Pacific herring, and shiner surfperch (Ainley, et al. 1996). In terms of frequency of occurrence, the presence of squid varies dramatically. For diving birds such as rhinoceros auklets, common murre, arctic loons, and Brandt's cormorants, the frequency of occurrence of squid in the diet can range from 85 to 33 percent (Baltz and Morejohn 1977). For plunging, surface feeding birds, such as shearwaters and gulls, the frequency of occurrence ranges from 67 to 0 percent (Baltz and Morejohn 1977).

In order to assess market squid fishery impacts on seabirds that consume squid it is necessary to know how much seabirds depend on the squid resource. Although there is documentation detailing consumption of squid by some seabird species, it is not possible to estimate the total amount of market squid consumed by all seabirds in California waters. Thus, at the current time it is not possible to determine the allocation



of market squid necessary to sustain seabird populations and consequently, makes analysis of whether market squid fishery management practices are having a potentially adverse impact on these species difficult. However, it should be noted that the goal of squid fishery management is to maintain a long-term economically viable fishery that matches the level of effort to the health of the resource, and under MLMA, the Department must consider the ecosystem impacts of the squid fishery, namely the conservation of not only the squid, but of the other marine species that depend on squid.

The goals of the MSFMP include ensuring sustainability of the squid resource and the marine life that depends on squid. The restricted access program along with the seasonal catch limit and weekend closures function to disburse the take of market squid throughout the season and allow spawning to take place throughout the season. Additionally, fisheries independent data suggests that squid distribution is widespread and that fishing does not occur in all areas of distribution and that not all spawning grounds are targeted. Historical evidence from research cruises along the west coast, as well as recent catch data, suggests that squid biomass may be very large at times and distributed widely along the entire west coast. The squid fishery has a monitoring program which assists in management of the squid fishery to achieve sustainability and the squid harvest is monitored through an egg escapement model. Implementation of seabird time and area closures around Anacapa and Santa Barbara islands and the squid harvest replenishment/general habitat closure area in waters north of Pillar Point would benefit seabirds from an increase in prey species available to seabirds in the closed areas. This would benefit all seabird species in the closed area that prey on squid. The latter option would make half of the state a squid harvest replenishment area. Finally, the effects of removing squid from the ecosystem is not unique to the proposed project as this condition currently exists in the market squid fishery. Removal of squid as prey available to marine bird species is expected to continue even with implementation of the proposed project.

Direct Effects

Implementation of the proposed project could affect listed marine bird species through interaction with fishing activities and disturbance. These effects, however, are not unique to the proposed project. Instead, these effects and conditions currently exist in the market squid fishery and presently occur as a result of fishing and other activities in the market squid fishery. The restricted access options, in conjunction with the fishery control rule options, are designed to prevent an overfished condition from occurring by disbursing the take of market squid throughout the season and by allowing market squid spawning to take place throughout the season. Implementation of the fishery control rule and restricted access options will reduce the number of vessels but not necessarily the effort as the remaining vessels would make up for the market demand. The number of bait vessels may increase, but the design of the permit transfer system does not allow for increases in the harvesting capability of the fleet. Accordingly, total fishing effort would be equal to or less than the status quo project. There is still the potential for vessels to interact with several surface-feeding and scavenging seabird species (gulls, albatrosses, fulmars, and shearwaters) which may be attracted to the vessels to



feed on squid. Thus, we cannot rule out the possibility that the squid purse seine fishery may interact with these species. Currently, the fishery does not have observers so interactions with these species have not been reported. However, these effects and conditions currently exist in the market squid fishery and the activities and effects are expected to continue even with implementation of the proposed project.

Seabird Closure Option

Implementation of the seabird closure option would establish area and time closure areas for squid vessels using attracting lights around Anacapa and Santa Barbara islands from 1 February through 30 September from 1 nautical mile from the Mean High Water mark for these islands. It is assumed that the squid fishery will not fish at night without the use of attracting lights, thus, this closure would discourage squid vessels from these areas at night. This area and time closure will serve primarily to protect nesting California brown pelicans, an endangered and fully protected species, from light disturbance associated with the squid fishery during the height of their breeding season. In addition, all seabirds that forage in the waters and/or breed on these islands (see Tables 3-5, 4-1, Figures 4-1, 4-2) would benefit because there would be decreased interactions from lights associated with the squid vessels. Santa Barbara Island is considered one of the most important seabird nesting areas in the southern California Bight, in terms of numbers of species and numbers of breeding birds, while Anacapa Island supports the largest breeding colony of California brown pelicans in the United States.

Thus, the time and area closures would significantly reduce any potential impact of light pollution near breeding habitat for the listed California brown pelican, candidate/threatened Xantus's murrelet, and several SSC (ashy storm-petrel, black storm-petrel, double crested cormorant). Anacapa and Santa Barbara islands provide nesting habitat for all of the breeding California brown pelicans in the United States, about 75 percent of the Channel Island population and about 25 percent of the world's population of Xantus's murrelet, about 33 percent of the Channel Island population and about 14 percent of the world's population of ashy storm-petrel, and all of the breeding black storm-petrels (Santa Barbara Island) in the United States (as well as habitat for other species listed in Table 4-1). The majority of the Channel Islands seabirds nest between March and August, thus the time closure from 1 February to 30 September would incorporate the entire breeding season for several seabird nesting species, during most years. California brown pelicans have a protracted breeding season which can start as early as January and end as late as October. Ashy storm-petrel nesting is also protracted (starts in April) and the majority of chicks fledge in September and October. Xantus's murrelets may visit breeding sites starting in January. Breeding seabirds would still be susceptible to inflight strikes and colony disturbances if attracting lights are used in the squid fishery close to seabird breeding colonies during January and October. However, the closures would not reduce any impacts to the federally threatened western snowy plover which nest on the east side of Santa Rosa Island. No studies have been conducted to determine if the bright lights and noise associated with the squid fishery has a negative impact on the breeding activity of western snowy



plovers although it is known that increased light levels can alter the behavior of diurnal species and result in nest abandonment (Avery 2000, Bower 2000). Additionally, diurnal predators, such as western gulls, have been noted by researchers as more active at night when squid lights are on (Channel Island National Park, unpublished data). Thus, predation rates of plover adults, eggs, and/or chicks by diurnal predators could be increased over normal levels. Therefore, it is possible that the fishery could have impacts to nesting plovers if fishing occurs close to breeding colonies during the breeding season. But since the market squid fishery typically fishes during the winter months, impacts to this species would only occur if fishing extended into the breeding season.

Additionally, under this seabird closure option, noise associated with squid fishing activities (e.g., engine noise, generators, radios, gunshots, seal bombs, gunshots, human voices) still has the potential to cause disturbances to breeding seabirds which require nesting and roosting sites free from human disturbance. In the last 2 years, there has been an increased trend for squid fishermen to fish during daylight hours. Thus, it is likely that the squid fleet will fish in these areas during the daytime and noise and disturbance will still be an issue for breeding seabirds. At this time, there is no control over the number of squid vessels in any particular area. Personnel from the CINPS have reported squid boats fishing as close as 75 to 450 feet (< 1/8 mile) from Anacapa Island, and as many as 12 boats at one time. California brown pelicans, cormorants, alcids, and other seabirds, are affected by ancillary fishing activities 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 also loud noises. Disturbances (including close vessel approach) at California brown pelican, double-crested and Brandt's cormorants, and common murre colonies are known to cause nest abandonment and increased egg predation (Ellison and Cleary 1978, Anderson and Keith 1980, Anderson 1988, Parker et al. 2000, Rojek and Parker 2000, Parker et al. 2001). The low productivity of California brown pelicans on Anacapa Island in 1999 has been attributed to both the noise and associated lights of squid vessels close to the island.

Although it is assumed that most participants in the squid fishery will not fish at night without the use of attracting lights, some squid vessels may choose to fish at night without attracting lights. Even then, some level of artificial lighting will be necessary for squid vessels to conduct their operations safely. We cannot rule out the possibility that unregulated artificial night lighting associated with the market squid fishery will result in disorientation of these species and collisions with vessels. With no control over the number of vessels in an area, it is possible that multiple boats with operating lights could be close to seabird colonies during sensitive periods in their nesting season. For example, small amounts of light on vessels in the Channel Islands have been observed to cause disorientation in Xantus's murrelets and their chicks when they depart the colony (Zeidberg pers. comm.). Thus, noise and disturbance will still be an issue for seabirds. Monitoring the squid fishery to determine where the fishery is concentrated after implementation would be necessary to assess impact to seabirds.



Under the proposed seabird closure option not all seabird colonies in the Channel Islands will receive protection. Castle Rock and Prince Island off San Miguel Island are considered, along with Santa Barbara Island, to be the most important seabird nesting areas in the southern California Bight, in terms of numbers of species and numbers of birds. The only nesting colonies in the Channel Islands of the SSC species rhinoceros auklet and tufted puffin are found on San Miguel Island (Figure 4-3, Table 4-1), and western snowy plovers are found on Santa Rosa Island. San Miguel and Santa Cruz islands provide important habitat for ashly storm-petrels (about 68 percent of the Channel Island population) and Xantus's murrelets (about 18 percent of the Channel Island population) and small numbers of both of these species have been found breeding on Santa Catalina and San Clemente islands. Squid fishing does currently occur off Santa Cruz Island but rarely occurs off San Miguel Island. Closures to light use around Anacapa and Santa Barbara islands could result in increased night-fishing pressure around Santa Cruz Island and an extension of the fishery to San Miguel Island and possibly increased effort at Santa Rosa. This could result in negative impacts to seabird species on these islands, and the level of impact is potentially greater than the status quo due to the importance of San Miguel Island for breeding seabirds. Some protection will occur at Prince Island given that it is in the Harris Point State Marine Reserve, a no-take MPA. But since the market squid fishing season typically occurs during the winter months, impacts to these other islands would only occur if fishing extended into the breeding season and squid were available in these areas. In summary, the proposed seabird closure option would reduce the ongoing impacts of light use currently associated with the squid fishery from the status quo. If this option is chosen, we recommend monitoring the squid fishery, through the evaluation of squid fishing logbooks, to determine where the fishery is concentrated after implementation. We also recommend measuring noise and other activities to determine if the squid fishery is impacting seabird colonies in the Channel Islands. Additionally, we need to determine if the area and time closures to use of attracting lights in the squid fishery is enforceable. Then, if the data warrants, additional conservation and management measures can be formulated.

Squid Harvest Replenishment/General Habitat Closure Area Option

Implementation of the squid harvest replenishment/general habitat area closure option would establish areas that are closed to squid fishing in all waters north of Pillar Point at any time. This would include the Gulf of the Farallones National Marine Sanctuary (GFNMS) and the Farallon Islands (a National Wildlife Refuge), Cordell Bank National Marine Sanctuary, and part of the Monterey Bay National Marine Sanctuary. The Farallon Islands are home to one of the largest and most diverse seabird colonies in the continental U.S. They provide critical nesting habitat for 12 species of marine and coastal birds including the SSC ashly storm-petrel, double-crested cormorant, tufted puffin and rhinoceros auklet (see Table 4.1).

In 2003, market squid vessels harvested more squid north of the traditional Monterey fishing grounds, in the area between Pigeon Point and Point Reyes, than the prior 12-



year average (1990-2002) (see Figure 3-7a-b in Section 1). In 2003, approximately 5,744 tons or 40 percent of the northern California market squid landings were taken from Pigeon Point to Point Reyes compared to the 12-year average of 666 tons or 7 percent. This disturbed some biologists and other users of the area. The removal of squid biomass in this area was of particular concern because squid are an important prey item for the many seabirds that utilize these waters including the common murre, ash storm-petrel, and rhinoceros auklet feed (Morejohn et al. 1978). Additionally, the squid fishery has the potential to directly affect seabirds from squid fishing activities (see previous section concerning seabird issues in the Channel Islands).

The Farallon Islands provide nesting habitat for 50 percent of the U.S. population of breeding ash storm-petrels (Carter et al. 1992). The only other major nesting site for the ash storm-petrel is at the Channel Islands. Populations of ash storm-petrels have declined by an estimated 34 percent over the past 20 years at the Farallon Islands (Sydeman et al. 1998a, 1998b) and would be at risk from interaction with the squid fishery. Factors in their decline include habitat loss from invasive non-native plants; introduction of feral cats, house mice, and other nonnative animals; and predation by house mice, western gulls, burrowing owls, and other owl species (Sydeman et al. 1998, Nur et al. 1999). Ash storm-petrels are also known to be sensitive to human disturbance, oil pollution, and marine pollution. Thus, ash storm-petrels could be affected by ancillary squid fishing activities (e.g., vessel proximity, motor noise, generators, gunshots, seal bombs, radios, etc.) near their roosting and breeding sites. Another issue of concern would be the increase in artificial light intensity levels associated with night-time squid fishery boat activity during the breeding season. Artificial night lighting associated with the market squid fishery could significantly impact recovery of this species and impacts to the Farallon Island populations of ash storm-petrels could have serious, long-term consequences for the survival of this species.

Squid fishing activities also have the potential to impact the other 11 species of marine and coastal birds that breed at the Farallon Islands including the SSC double-crested cormorant, rhinoceros auklet, and tufted puffins. Disturbance and noise associated with squid fishing activities (e.g., engine noise, generators, radios, gunshots, seal bombs, gunshots, human voices) at the Farallon Islands has the potential to cause disturbances to breeding seabirds which require nesting and roosting sites free from human disturbance, such as the alcids and cormorants. Rhinoceros auklets are nocturnal at nesting colonies and accustomed to flying in total darkness. They too, may become disoriented in bright lights and are susceptible to inflight strikes resulting in mortality or injury. Additionally, fledgling chicks of tufted puffins depart for the sea alone, at night (Gaston and Jones 1998), and may become attracted and disoriented by lights and collide with vessels, increasing the normal mortality rates of the young-of-the-year. Behavior patterns of gulls may be influenced by fishery activities. For example, gulls, which are normally diurnal, are known to forage at night near squid fishing boats where they are attracted by the activity and bright lights. Artificial lighting may also increase lighting and foraging abilities of gulls on other seabird colonies, resulting in increased levels of predation on nocturnally nesting seabirds. In 1999, western gulls were noted by researchers as more active at night when squid lights were on in the Channel Islands



(CINPS, unpublished data). Implementation of the squid harvest replenishment/general habitat closure in all waters north of Pillar Point would eliminate direct and indirect market squid fishery impacts to ashy storm-petrels, double-crested cormorants, rhinoceros auklets, tufted puffins and the other eight species of nesting seabirds that breed at the Farallon Islands and forage in the surrounding waters.

In conclusion, significant impacts on listed marine and coastal seabirds are not expected from the combined effects of the individual project options because implementation of the proposed MSFMP will benefit natural resources held in trust for the people of California when compared to existing conditions.



Table 4-1 Seabird species that breed (indicated by an X) in the Channel Islands and the Farallon Islands									
	ANA	SBI	SMI	SRI	SCR	CAT	SCL	SNI	Farallon Is.
Diurnal Species									
California Brown Pelican*	X	X	R		R		R	R	
Double-Crested Cormorant**	X	X	X					X	X
Brandt's Cormorant	X	X	X	X	X		X	X	X
Pelagic Cormorant	X	X	X	X	X				X
Western Gull	X	X	X	X	X	X	X	X	X
Pigeon Guillemot	X	X	X	X	X				X
Tufted Puffin**			X						X
Western Snowy Plover †,**			----x	X					
Black Oystercatcher	X	X	X	X	X		X	X	X
Common Murre									X
Nocturnal Species									
Ashy Storm-Petrel**	P	X	X		X	X	X		X
Black Storm-Petrel**		X	X			X	X		
Leach's Storm-Petrel		X	X						X
Xantus's Murrelet**, ***	X	X	X		X	X	X		
Rhinoceros Auklet**			X						X
Cassin's Auklet	X	X	X		X				X

*Federally and State listed as endangered, † Federally listed as threatened, ** Department Species of Special Concern (SSC), ----x = not seen since 1991

*** Species in the process of being added to the State threatened species list CCR Title 14

P= probable nesting, R= Roost site

ANA=Anacapa, SBI= Santa Barbara, SMI= San Miguel, SRI= Santa Rosa,
 SCR= Santa Cruz, CAT= Santa Catalina, SCL= San Clemente, SNI= San Nicolas



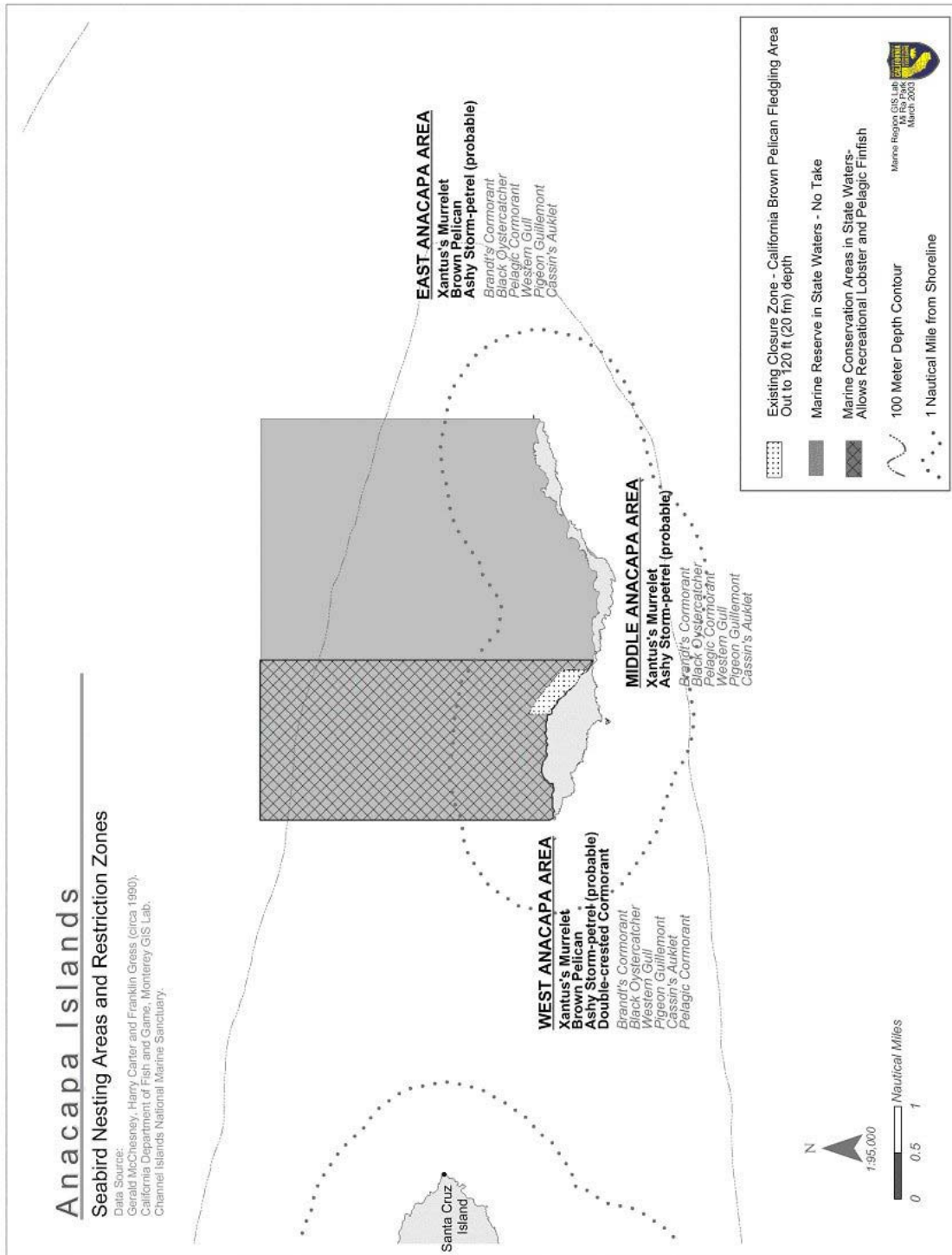


Figure 4-1. Seabird nesting at Anacapa Island



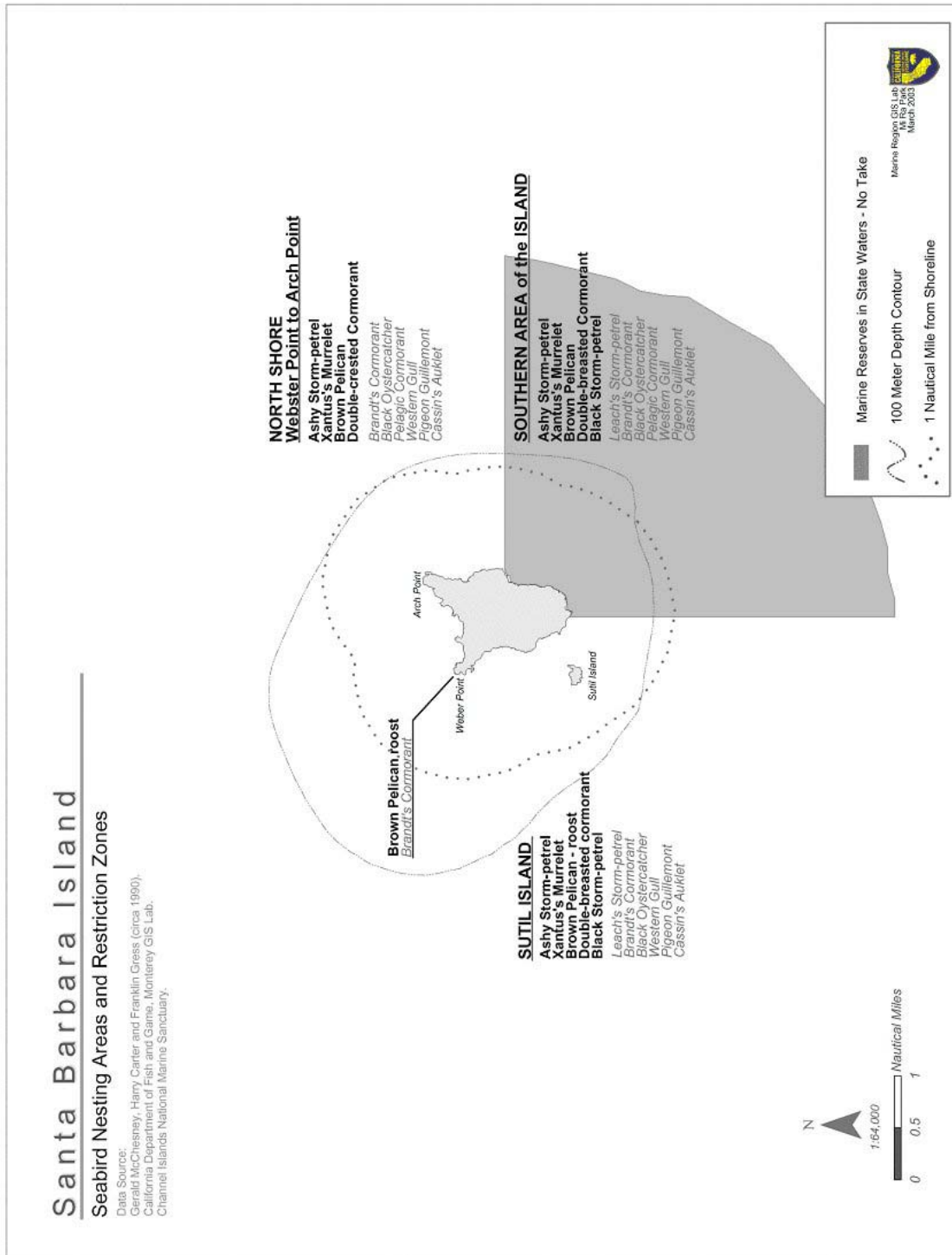


Figure 4-2. Seabird nesting at Santa Barbara Island



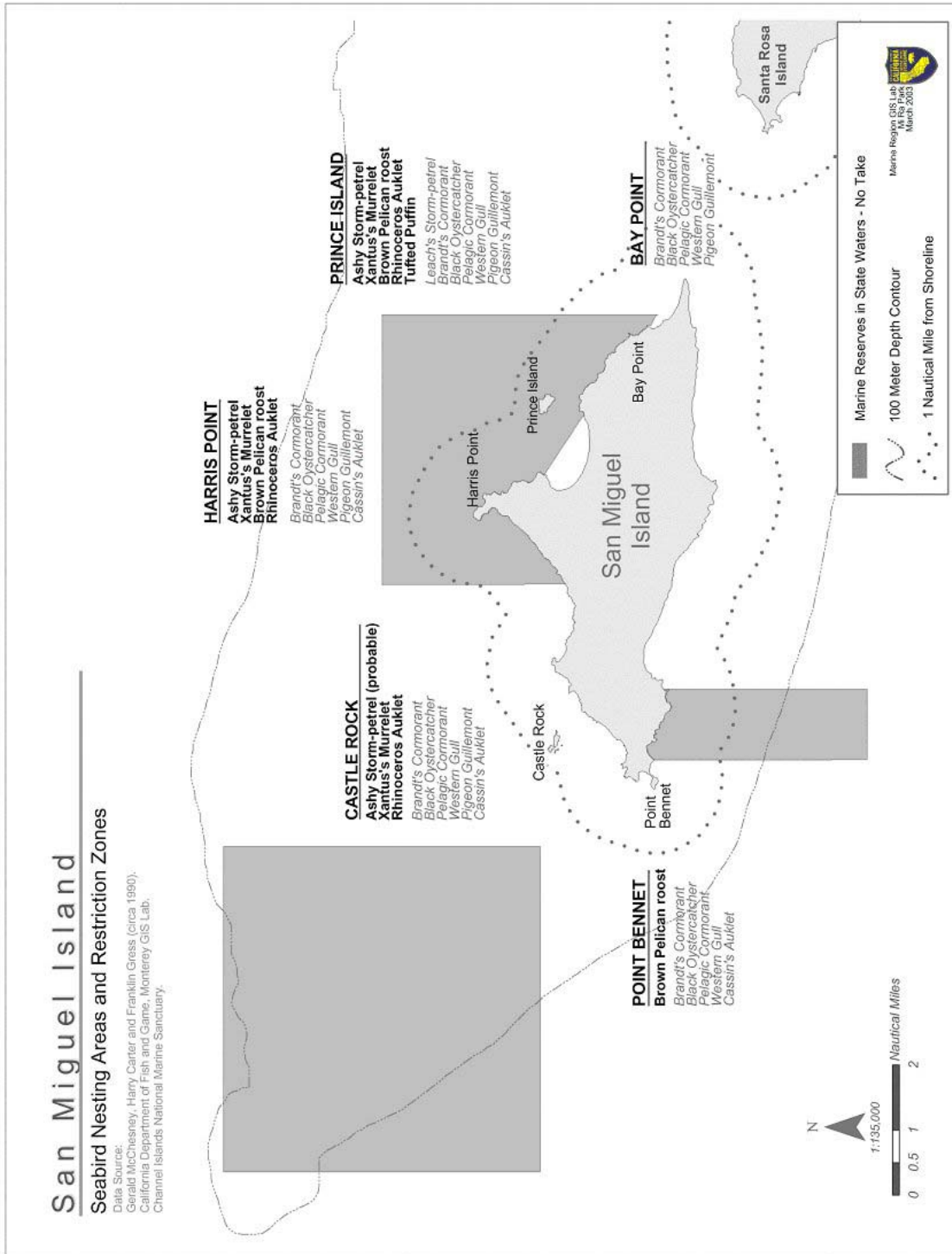


Figure 4-3. Seabird nesting at Anacapa Island



4.1.9.3 Effects to Listed Marine (Sea) Turtles

Implementation of the proposed project is not expected to additionally affect sea turtles. Implementation of the fishery control rule and restricted access options will reduce the number of vessels but not necessarily the effort as the remaining vessels would make up for the market demand. Accordingly, total fishing effort would be equal to or less than the current conditions, thus, impacts to sea turtles from this option would be the same as those in the current fishery. Implementation of the seabird time and area closures around Anacapa and Santa Barbara islands may result in shift of fishing activities for the southern fleet. There would be no sea turtle interaction during closed times and in closed areas, but if fishing effort shifted to other areas it could increase the potential of interactions between sea turtles and fishing gear. However, the southern fleet targets a multitude of fishing spots including other areas of the Channel Islands and the coastal area from Point Conception south to La Jolla. Additionally, the proposed closure areas at the Channel Islands represent less than 1 percent of the squid fishing effort during the closed area time frame over the past 2 years and less than 3 percent over the past 8 years. Implementation of the harvest replenishment/general habitat closure option would establish an area closed to squid fishing in all waters north of Pillar Point at any time. There would be no sea turtle interaction in the closed area, but if fishing effort shifted to other areas it could increase the potential of interactions between sea turtles and fishing gear. However, the proposed closure in northern waters was not an area frequently fished for market squid (at least prior to 2003). Thus, the shift in effort is considered minimal. Finally, the current interaction levels with sea turtles are very low, thus, implementation of time and/or area closures is not expected to significantly increase from the no-project alternative. A potential benefit to sea turtles may occur from an increased productivity of prey species available to sea turtles in the closed areas as these areas would function as squid harvest replenishment areas during the closed times. It is doubtful that the proposed project would reduce the numbers of market squid available as prey items to sea turtles, as fishing activities would continue at current levels.

Thus, effects on sea turtles from implementation of the proposed project are expected to be less than significant under CEQA. Finally, significant impacts on marine turtles are not expected from the combined effects of the individual project options because implementation of the proposed MSFMP will benefit natural resources held in trust for the people of California when compared to existing conditions.

4.1.9.4 Effects to Listed Fish

The effects of fishery management decisions on populations of fish species are typically considered in the context of direct and indirect effects. Direct effects are those where a fish is incidentally taken (bycatch) during harvest activities. Indirect effects include negatively affecting fish prey abundance and availability.

Indirect Effects



Market squid are eaten by a number of fish although their importance in the diet varies among species. In Monterey Bay, 19 species of fish were found to feed upon market squid, including many commercial and recreational important species such as Pacific bonito, salmon, halibut, and tuna (Fields 1965, Morejohn et al. 1978). Predators from many trophic levels utilize both small pelagic fishes, such as northern anchovy, sardine, and squid as either a primary or supplementary food source. The proportion of the diet that squid makes up varies dramatically between species, geographical location, and environmental conditions. Most squid predators are not squid specialists (squid is rarely the sole prey item) and because of its highly variable abundance squid cannot be relied on as a stable food source, additionally, it has limited energetic value (O'Dor et al. 1986). Therefore, squid predators often must switch to more abundant or energetically profitable prey species (Ainley et al. 1996, Sydeman et al. 1997), or target squid when they are most abundant during spawning aggregations and minimal energy is needed for capture. The amount of squid in the diet of fish predators changes dramatically between geographical locations due to differences in environmental conditions and availability. For chinook salmon, squid composed 7 to 9 percent of diet (by volume) and ranked third or fourth behind northern anchovy, euphausiids, and juvenile rockfish depending on location, San Francisco or Monterey (Morejohn et al. 1978). At other locations along the west coast, squid is not an important prey item for chinook since they prey mainly on fish (Groot and Margolis 1991). In chilipepper rockfish, squid ranked third behind juvenile rockfish and other fishes (Morejohn et al. 1978). Other fish predators in which squid ranked high as a prey item includes mainly bottom dwelling species including curlfin turbot, speckled and Pacific sanddabs, lingcod, petrale sole, and Pacific halibut (Morejohn et al. 1978). Several pelagic species also feed on squid when available such as blue shark, common thresher shark, and albacore (Morejohn et al. 1978). The changing availability of squid also affects potential predators. Blue sharks and Pacific bonito increase their consumption of market squid during the squid spawning season. It has been suggested that blue sharks near Santa Catalina Island (Tricas 1979) may move inshore as the squid spawning season begins. Pacific bonito consumption of squid is influenced by the shoaling behavior of squid spawning in nearshore waters of southern California (Oliphant 1971).

In order to assess market squid fishery impacts on fish species that consume squid it is necessary to know how much the fish depends on that resource. Although there is documentation detailing consumption of squid by some fish species, it is not possible to estimate the total amount of market squid consumed by all fish in California waters. Thus, at the current time it is not possible to determine the allocation of market squid necessary to sustain fish that predate on fish and consequently, makes analysis of whether market squid fishery management practices are having a potentially adverse impact on these species difficult. However, it should be noted that the goal of squid fishery management is to maintain a long-term economically viable fishery that matches the level of effort to the health of the resource, and under MLMA, the Department must consider ecosystem impacts of the squid fishery, namely the conservation of not only the exploited species, but of the other species that depend on that resource.



The goals of the MSFMP include ensuring sustainability of the squid resource and the marine life that depends on squid. The restricted access program along with the seasonal catch limit and weekend closures function to disburse the take of market squid throughout the season and allow spawning to take place throughout the season. Additionally, fisheries independent data suggests that squid distribution is widespread and that fishing does not occur in all areas of distribution and that not all spawning grounds are targeted. Historical evidence from research cruises along the west coast, as well as recent catch data, suggests that squid biomass may be very large at times and distributed widely along the entire west coast. The squid fishery has a monitoring program which assists in management of the squid fishery to achieve sustainability and the squid harvest is monitored through an egg escapement model. Implementation of seabird time and area closures around Anacapa and Santa Barbara islands and the squid harvest replenishment/general habitat closure area in waters north of Pillar Point would benefit fish that prey on squid from an increase in prey species available to them in the closed areas. The latter option would make half of the state a squid harvest replenishment area. Finally, the effects of removing squid from the ecosystem is not unique to the proposed project as this condition currently exists in the market squid fishery. Removal of squid as prey available to fish species is expected to continue even with implementation of the proposed project.

Direct Effects

Fishing and other activities associated with the MSFMP will not occur in tidewater goby habitat (low salinity waters in estuaries) therefore, no effects are predicted. No fishing activities will occur in salmon spawning or rearing habitats. Restricted access options serve to reduce fishing effort but not significantly less than that in the no-project alternative. Implementation of seabird time and area closures around Anacapa and Santa Barbara islands and the squid harvest replenishment/general habitat closure area in waters north of Pillar Point would eliminate any potential for bycatch in the closed areas. There would be no catch interaction during closed times in closed areas, but exclusion of squid fishing in closed areas could shift fishing effort to other areas which could increase the potential of catch of listed fish. However, bycatch is minimal in the commercial market squid fishery. Ongoing dockside sampling efforts, conducted statewide since 1998, revealed a small increase of salmon bycatch in squid catches delivered to central California commercial markets. A total of eight salmon (seven chinook salmon, one unidentified salmon) were observed as bycatch in 2002 and 2003. Four of the seven Chinook salmon were caught north of Pigeon Point, while the remaining Chinook and unidentified salmon were collected from landings in Monterey Bay. However, none of these salmon were listed species. Thus, effects on listed fish from implementation of the proposed project are expected to be less than significant under CEQA.

4.1.10 Effects to Non-listed Species

Impacts are considered significant if the proposed project has substantial adverse effects on biological functions such as feeding, migration, or reproduction, or where the



project impedes the use of nursery sites, or modifies habitat such that a regional shift in species distribution occurs.

With the implementation of the proposed project, all non-listed species have the continued potential for interactions with fishing gear proposed project would utilize the same fishing gear as currently exists in the market squid fishery.

4.1.10.1 Effects to Non-listed Marine Mammals

Indirect effects to non-listed marine mammal species who consume squid are discussed in Section 4.1.9.1, under effects to protected or listed marine mammals.

Direct Effects

The restricted access options reduces the number of vessels but not necessarily the effort as those remaining vessels will make up for the market demand. The number of brail vessels may increase, but the squid brail fishery is considered a Category III fishery (those with a remote likelihood of marine mammal interaction or no known serious injuries or mortalities with marine mammals) and although there were past mortalities of short-finned pilot whales and California sea lions, these animals were likely intentionally killed to protect catch or gear, rather than incidental kills (such as entanglements). These takes are now illegal under the 1994 Amendment to the MMPA. The design of the permit transfer system does not allow for increases in the harvesting capability of the fleet. Accordingly, total fishing effort would be equal to or less than current conditions. As described in Chapter 3, there have been recent anecdotal reports of pilot whale sightings in the vicinity of squid fishing operations. There is documented mortality for California sea lions, short-finned pilot whales, and Risso's dolphins in the market squid fishery off southern California and because offshore bottlenose dolphins are often associated with Risso's dolphins and short-finned pilot whales, they too may experience some serious injury or mortality in the squid purse seine fishery (Heyning et al. 1994). Additionally, Pacific white-sided dolphins and short-beaked and long-beaked common dolphins also may experience interactions with the market squid fishery due to their distribution and habit of feeding on squid at night. Some of the past mortalities of non-listed marine mammal species probably represented animals that were intentionally killed to protect catch or gear, rather than those incidentally killed by squid fishing gear. These takes are now illegal under the 1994 Amendment to the MMPA. However, the fishery is not monitored so recent mortality of these species has not been reported. It is assumed that any impacts to these species are less than significant.

Implementation of time and area closures around Anacapa and Santa Barbara islands for squid vessels using attracting lights from 1 February to 30 September and the squid harvest replenishment/general habitat closure area in all waters north of Pillar Point is not likely to increase total fishing effort beyond current level, but it may result in a shift of fishing location. There would be no marine mammal interactions during closed times and in closed areas, but exclusion of squid fishing in closed areas could shift fishing effort to areas with higher marine mammal populations (e.g. adjacent to pinniped



rookeries, haul out sites, foraging areas). This could result in a higher rate of squid fishery interaction with marine mammals, particularly at the Channel Islands. However, the southern fleet targets a multitude of fishing spots including other areas of the Channel Islands and the coastal area from Point Conception south to La Jolla, while the closed area in waters north of Pillar Point was not an area frequently fished for market squid (at least prior to 2003). Additionally, the closed areas in the Channel Islands represent less than 1 percent of the squid fishing effort during the closed area time frame over the past 2 years and less than 3 percent over the past 8 years, so the shift in fishing effort is considered minimal. Finally, there are already closures in existence that prohibit fishing in sensitive marine mammal habitat. A potential benefit to marine mammals may occur from an increased availability of market squid available to marine mammals in the closed areas. Thus, we assume that implementation of the proposed project is not expected to have additional impacts to marine mammals and is not expected to change relative to existing conditions.

4.1.10.2 Effects to Non-listed Marine and Coastal Birds (Seabirds)

Indirect impacts to non-listed seabirds are discussed in Section 4.1.9.2, under effects to protected or listed seabirds.

Direct Effects

Implementation of the proposed project could affect non-listed marine bird species through interaction with fishing activities, disturbance, discharge of pollutants, and removal of prey species. These effects, however, are not unique to the proposed project. Instead, these effects and conditions currently exist in the market squid fishery and presently occur as a result of fishing and other activities in the market squid fishery. These activities and effects are expected to continue even with implementation of the proposed project.

Implementation of the fishery control and restricted access options will reduce the number of vessels but not necessarily the effort as the remaining vessels would make up for the market demand. The number of bait vessels may increase, but the design of the permit transfer system does not allow for increases in the harvesting capability of the fleet. Accordingly, total fishing effort would be equal to or less than the status quo. There is still the potential for vessels to interact with several surface-feeding and scavenging seabird species (gulls, albatrosses, fulmars, and shearwaters) which may be attracted to the vessels to feed on squid. Thus, we cannot rule out the possibility that the squid purse seine fishery may interact with these species. Currently, the fishery does not have observers so interactions with these species have not been reported. However, these effects and conditions currently exist in the market squid fishery and the activities and effects are expected to continue even with implementation of the proposed project.

Implementation of the seabird closure would establish area and time closure areas for squid vessels using attractant lights around Anacapa and Santa Barbara islands from 1 February through 30 September from 1 nautical mile from the Mean High Water mark



for these islands. It is assumed that the squid fishery will not fish at night without the use of attracting lights, thus, this closure would discourage squid vessels from these areas at night. This area and time closure will serve to protect all seabirds that forage in the waters and/or breed on these islands (see Tables 3.5, 4.1, Figures 4.1, 4.2) because there would be decreased interactions from lights associated with the squid vessels. Santa Barbara Island is considered one of the most important seabird nesting areas in the southern California Bight, in terms of numbers of species and numbers of breeding birds, while Anacapa supports the largest breeding colony of California brown pelicans in the United States. Thus, the time and area closures would significantly reduce any potential impact of light pollution near breeding habitat for the Brandt's cormorant, pelagic cormorant, western gull, pigeon guillemot, black oystercatcher, Leach's storm petrel and Cassin's auklet. The majority of the Channel Islands seabirds nest between March and August, thus the time closure from 1 February to 30 September would incorporate the entire breeding season for several seabird nesting species, during most years.

However, under this option, noise associated with squid fishing activities (e.g., engine noise, generators, radios, gunshots, seal bombs, human voices) still has the potential to cause disturbances to breeding seabirds which require nesting and roosting sites free from human disturbance. In the last 2 years, there has been an increased trend for squid fishermen to fish during daylight hours. Thus, it is likely that the squid fleet will fish at Anacapa and Santa Barbara during the daytime and noise and disturbance will still be an issue for breeding seabirds. At this time, there is no control over the number of squid vessels in any particular area. Personnel from the CINPS have reported squid boats fishing as close as 75 to 450 feet (< 1/8 mile) from Anacapa Island, and as many as 12 boats at one time. California brown pelicans, cormorants, alcids, and other seabirds, are affected by ancillary fishing activities (e.g., vessel proximity, motor noise, generators, gunshots, seal bombs, 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 also loud noises. Disturbances (including close vessel approach) at California brown pelican, double-crested and Brandt's cormorants, and common murre colonies are known to cause nest abandonment and increased egg predation (Ellison and Cleary 1978, Anderson and Keith 1980, Anderson 1988, Parker et al. 2000, Rojek and Parker 2000, Parker et al. 2001).

Although it is assumed that the squid fishery will not fish at night without the use of attracting lights, however, some squid vessels will choose to fish at night without attracting lights. In this case some level of artificial lighting will be necessary for squid vessels to conduct their operations safely. We cannot rule out the possibility that this artificial night lighting, associated with the market squid fishery, will result in disorientation of these species and collisions with vessels. With no control over the number of vessels in an area, it is possible that multiple boats with operating lights could be close to seabird colonies during sensitive periods in their nesting season. For example, small amounts of light on vessels in the Channel Islands have been observed



to cause disorientation in Xantus's murrelets and their chicks when they depart the colony (Zeidberg pers. comm.). Thus, noise and disturbance will still be an issue for seabirds. Monitoring the squid fishery to determine where the fishery is concentrated after implementation would be necessary to assess impact to seabirds.

Under the proposed option not all seabird colonies in the Channel Islands will receive protection. Castle Rock and Prince Island off San Miguel Island are considered, along with Santa Barbara Island, to be the most important seabird nesting areas in the southern California Bight, in terms of numbers of species and numbers of birds. The only nesting colonies in the Channel Islands of the SSC species rhinoceros auklet and tufted puffin are found on San Miguel Island (Figure 4-3, Table 4-1). San Miguel and Santa Cruz islands provide important habitat for ashy storm-petrels (about 68 percent of the Channel Island population) and Xantus's murrelets (about 18 percent of the Channel Island population) and small numbers of both of these species have been found breeding on Santa Catalina and San Clemente islands. Squid fishing does currently occur off Santa Cruz Island but rarely occurs off San Miguel Island. Closures to light use around Anacapa and Santa Barbara could result in increased night-fishing pressure around Santa Cruz Island and an extension of the fishery to San Miguel Island. This could result in negative impacts to seabird species on these islands, and the level of impact is potentially greater than the status quo due to the importance of San Miguel Island for breeding seabirds. Some protection will occur at Prince Island since it is in the Harris Point State Marine Reserve a no-take MPA. But since the market squid fishing season typically occurs during the winter months, impacts to these other islands would only occur if fishing extended into the breeding season and squid were available in these areas.

In summary, the proposed seabird closure option at the Channel Islands would reduce the impacts of light use associated with the squid fishery from the status quo. If this option is chosen, we recommend monitoring of the squid fishery to determine where the fishery is concentrated after implementation. We also recommend monitoring of the squid fishing to determine if noise and other activities associated with the squid fishery is impacting seabird colonies in the Channel Islands and to determine if the area and time closures to use of attracting lights in the squid fishery is enforceable.

Implementation of the squid harvest replenishment/general habitat closure option would establish areas that are closed to squid fishing in all waters north of Pillar Point at any time. This would include the GFNMS and the Farallon Islands. The Farallon Islands are home to one of the largest and most diverse seabird colonies in the continental U.S., providing critical nesting habitat for 12 species of marine and coastal birds. In 2003, market squid vessels harvested more squid north of the traditional Monterey fishing grounds, in the area between Pigeon Point and Point Reyes, than the prior 12 year average (1990-2002) (see Figure 3-7a-b in Section 1). In 2003, approximately 5,744 tons or 40 percent of the northern California market squid landings were taken from Pigeon Point to Point Reyes compared to the 12-year average of 666 tons or 7 percent. This disturbed some biologists and other users of the area. The removal of squid biomass in this area was of particular concern because squid are an important



prey item for the many seabirds that utilize these waters. Additionally, the squid fishery has the potential to directly affect (disturb) seabirds from ancillary squid fishing activities such as vessel proximity, motor noise, generators, gunshots, seal bombs, radios and the bright lights near their roosting and breeding sites. Behavior patterns of gulls may be influenced by fishery activities. For example, gulls, which are normally diurnal, are known to forage at night near squid fishing boats where they are attracted by the activity and bright lights. Artificial lighting may also increase lighting and foraging abilities of gulls on other seabird colonies, resulting in increased levels of predation on nocturnally nesting seabirds. In 1999, western gulls were noted by researchers as more active at night when squid lights were on in the Channel Islands (CINPS, unpublished data). Implementation of the squid harvest replenishment/general habitat closure in all waters north of Pillar Point would eliminate direct and indirect market squid fishery impacts to the 12 species of nesting seabirds that breed at the Farallon Islands and forage in the surrounding waters.

Finally, significant impacts on non-listed marine and coastal seabirds are not expected from the combined effects of the individual project options because implementation of the proposed MSFMP will benefit natural resources held in trust for the people of California when compared to existing conditions.

4.1.10.3 Effects to Non-listed Fish

Indirect impacts to non-listed fish are discussed in Section 4.1.9.4 under effects to listed fish.

Direct Effects

The restricted access component reduces the number of vessels but not necessarily the effort as those remaining vessels will make up for the market demand. Accordingly, total fishing effort is likely to be equal to or less than current conditions. Implementation of seabird time and area closures around Anacapa and Santa Barbara islands and the squid harvest replenishment/general habitat closure area in waters north of Pillar Point would eliminate any potential for bycatch in the closed areas. There would be no catch interaction during closed times in closed areas, but exclusion of squid fishing in closed areas could shift fishing effort to other areas which could increase the potential of catch of non-listed fish or remove market squid from the fish that prey upon them. However, incidental bycatch is minimal in the commercial market squid fishery. Through the Department's port sampling program, 2,402 samples were collected between October 1998 and October 2003 in California, with 886 observed landings containing incidentally caught fish and invertebrates. This represents a 37 percent occurrence by frequency of bycatch (See Section 1 Table 2-6). Two or more species were observed as bycatch in 47 percent of landings with bycatch. Most of this bycatch were other coastal pelagic species, including Pacific sardine, Pacific mackerel, northern anchovy and jack mackerel. Thus, effects on non-listed fish from the implementation of the proposed project are expected to be less than significant under CEQA.

4.1.10.4 Effects to Market Squid Resource



The goal of squid fishery management is to sustain both the squid population and the marine life that depend on squid. The proposed options protect the market squid resource by minimizing the risk of overfishing, and they reduce other ecological impacts. The restricted access component of the proposed project, in conjunction with the status quo and proposed fishery control rule options, are designed to prevent an overfished condition from occurring by disbursing the take of market squid throughout the season and allowing spawning to take place throughout the season. Restricted access will reduce the number of vessels but not necessarily the effort as those remaining vessels will make up for the market demand. Accordingly, total fishing effort is likely to be equal to or less than current conditions. Implementation of the seabird time and area closures and the squid harvest replenishment/general habitat closure area option is likely to result in no or little interaction with squid during closed times and in closed areas, so a potential benefit to the squid resource would occur from an increased productivity of squid in the closed areas. Additionally, areas closed to squid fishing would not incur the loss of squid egg cases (in Department sampling, approximately 3.2 percent of sampled landings contained squid egg cases). Exclusion of squid fishing in closed areas could shift fishing effort to other areas. However, the proposed closures in the Channel Islands represent less than 1 percent of the squid fishing effort during the closed area time frame over the past 2 years and less than 3 percent over the past 8 years, plus the southern fleet targets a multitude of fishing spots including other areas of the Channel Islands and the coastal area from Point Conception south to La Jolla. The proposed northern closure is not an area frequently fished for market squid (at least prior to 2003), so the shift in effort is considered minimal. Thus, effects on the market squid resource from the implementation of the proposed project is expected to be less than significant under CEQA.

Socioeconomic Environment

4.1.11 Effects to Land Use and Existing Infrastructure

Impacts are considered significant if the project would require new facilities such as housing, streets, parks, and other amenities to meet the demands of the project. Impacts also are considered significant if the project conflicts with any applicable land use plan, policy, or regulation of an agency with jurisdiction for an area affected by the project, but only where such a conflict results in a potentially significant change in existing physical conditions in and around the affected area.

Development activities within watersheds and in coastal marine areas often affect the habitat of marine organisms on both long-term and short-term scales. Runoff from development sites 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). However, effects of the proposed project



would be similar to current effects. Land use should not be affected by any proposed options.

With implementation and development of the MSFMP, impacts from the proposed project would be the same as currently exist in the market squid fishery. Fishing activities generally do not affect land use. Fishery control rules, restricted access, and time and area closures effects to land use are expected to be less than significant since the implementation of all these parts has the potential to reduce fishing activity and associated pressure on land based facilities from those that currently exist.

4.1.12 Effects to Transportation

Impacts are considered significant if the project causes an increase in traffic that is substantial in relation to the existing traffic load and capacity, if the project causes an exceedence in the applicable level of service standard, or the project causes a substantial increase in hazards due to design features or incompatible uses.

In general, the primary causes of change in demand for public and private services is a substantial change in demographic, economic, or social conditions of an area in a short period of time. The proposed project is not expected to result in a measurable change in the demand for public or private services. Therefore, the proposed project would have negligible effects on transportation.

4.1.13 Effects to Noise

Impacts are considered significant if the project results in exposure of persons or wildlife and aquatic species to noise levels in excess of applicable noise standards or criteria, a permanent increase in ambient noise levels in the project vicinity above existing levels, a substantial temporary or periodic increase in existing ambient noise levels in the project vicinity, or where the proposed project exposes sensitive noise receptors to noise levels in excess of existing conditions.

In general, squid fishing and other activities associated with the proposed project could affect ambient noise levels. These effects, however, are not unique to the proposed project. Instead, these affects and conditions currently exist in the market squid fishery and presently occur as a result of fishing and other activities in the market squid fishery.

These activities and effects are expected to continue even with implementation of the proposed project. Thus, even with adoption of the proposed project, the present and ongoing affect of noise are not expected to change relative to existing conditions.

Implementation of the restricted access options will reduce the number of vessels but not necessarily the effort as the remaining vessels would make up for the market demand. Implementation of time and area closures around Anacapa and Santa Barbara islands and in waters north of Pillar Point could result in a shift of fishing effort location. There would be less noise during closed times in the closed areas, but fishing



effort could shift to areas more sensitive to noise impacts (e.g., adjacent to pinniped rookeries, seabird breeding sites, adjacent to local communities). However, the closed areas in the Channel Islands represent less than 1 percent of the squid fishing effort during the closed area time frame over the past 2 years and less than 3 percent over the past 8 years, while the proposed closure in northern waters is not an area frequently fished for market squid (at least prior to 2003). Thus, the shift in fishing effort is considered minimal. Monitoring the squid fishery to determine where the fishery is concentrated after implementation will determine the impact of this effect. For these reasons, project-related effects on noise are generally expected to be less than significant.

4.1.14 Effects to Utilities

Impacts are considered significant if the proposed project requires the construction of or results in the need to construct new facilities or expansion of existing facilities, the construction of which would cause significant environmental effects.

No sizeable demand from project-related employment is expected to affect utilities. Therefore, the proposed project would have less than significant effects to utilities.

4.1.15 Effects to Archeology/Paleontology

Federal law, 36 CFR, Part 800 provides that environmental analyses need only consider effects on significant cultural resources. Significant resources include: resources listed on the National Register of Historic Places, eligible for listing in the National Register, designated as a National Historic Landmark, or listed in or eligible for listing in the California Register of Historical Resources. Impacts on historical resources are significant where the project may cause a substantial adverse change in the significance of a historical resource. A substantial adverse change in the significance of an historical resource means physical demolition, destruction, relocation, or alteration of the resource or its immediate surroundings such that the significance of an historical resource is materially impaired as defined in CCR Title 14 §15064.5, subdivision (b)(2). For the purposes of this significance threshold, historical resources shall include resources identified in CCR Title 14 §15064.5, subdivision (a). The significance of project-related impacts on archaeological and paleontological resources shall be determined in accordance with CCR Title 14 §15064.5, subdivision (c).

Most of the coastal shallow water areas where squid spawn have been characterized, by various EIRs, and are not considered sensitive for prehistoric resources (SLC 1999). Most fishing activity will occur away from shipwrecks due to high potential for gear damage or losses if shipwrecks are encountered. Decreasing the fishing fleet with restricted access would decrease effects to archaeological resources. Therefore, impacts to archaeology/paleontology would be less than significant due to the direct avoidance of these resources by fishery participants.

4.2 Potential Growth Inducing Factors



The proposed MSFMP is not expected to result in potentially significant growth inducing affects. The proposed project could foster some very limited economic activity, but that incremental affect would not be of a magnitude that it would stimulate the establishment of new businesses, population growth, or the construction of additional housing. In addition, no project characteristics are likely to remove obstacles to population growth or encourage or facilitate other activities that could significantly affect the environment, either individually or cumulatively.

4.3 Significant Irreversible Environmental Effects

CEQA section 15126(f) requires that the proposed project address potential impacts that could result in significant irreversible environmental changes, including the use of non-renewable resources and irretrievable commitment of resources. Irreversible commitments of resources are those that can not be reversed, except perhaps in the extreme long term (millions of years). The classic instance is when a species becomes extinct; this is an irreversible loss. Irretrievable commitments are those that are lost for a period of time. Most of the potential effects would be classified as irretrievable not irreversible. The proposed project would not result in significant irreversible environmental changes or irretrievable commitments of environmental resources. The project is designed to avoid significant adverse impacts to other species, their habitat, and listed or locally unique species.

4.4 Short-term Uses and Long-term Productivity

CEQA section 15126(e) requires that the cumulative and long-term effects of the proposed project that could affect the state of the environment, could narrow the range of beneficial uses of the environment, or that could pose long-term risks to health or safety be addressed. The proposed project will not affect a variety of short-term uses currently available nor are any significant impacts expected to occur. In addition, it will not adversely affect long-term productivity of statewide populations of market squid as the MSFMP is designed to bring squid populations and fishery participants into balance that promotes sustainability.

4.5 Cumulative Effects

In this section, the proposed project is analyzed in relation to other major projects in the region. Cumulative effects on environmental resources can result from the incremental effects of the project when added to other past, present, and reasonably foreseeable future projects in the area. Cumulative effects can result from individually minor but collectively significant actions over a period of time. The harvest levels in the proposed project become the cumulative harvest and are expected to have the overall effect of a sustainable harvest of market squid.

Other projects considered in the cumulative analysis include: delineation drilling



on OCS leases off Santa Barbara, development of the 36 undeveloped but leased OCS tracts, transportation of oil from Alaska and overseas, commercial fishing of depressed stocks, stormwater runoff, fiber optic cable installation, geophysical surveys, decommissioning (removing) of existing platforms, and commercial and residential development.

The development of the 36 offshore leases is anticipated between 2002 and 2030 (MMS 2001). Development of these leases would expect to increase crew and boat supply trips by approximately 3 percent above current levels. Impacts to marine mammals and marine and coastal birds are expected to result in temporary (less than 1-hour) localized disturbances. Helicopter trips routinely involve eight to ten trips each day per platform (MMS 2001). Pipeline construction activities would occur during the development phase. These activities would displace fishing activities from the associated infrastructure.

Since the prevailing onshore wind conditions exist along the coast, cumulative effects of air pollution could come from OCS activities, oil and container ship traffic, installation of fiber optic cables, and displaced fishing activities. During the next 28 years, all existing oil and gas platforms in federal and State waters are expected to be removed (MMS 2001). Platforms Hazel, Heidi, Hilda, and Hope were removed from State waters in 1996. In 2000, 877 oil tankers visited the Port of Los Angeles, Port of Long Beach and El Segundo. Of those, 192 were United States flagged oil tankers and 685 were foreign flagged oil tankers. The long-term oil supply outlook for California remains one of declining in-state and Alaska supplies leading to increasing dependence on foreign oil sources (CEC 1999). Since 1989, California refineries have received about half of Alaska's total production. If this trend remains unchanged into the 20-year future, the supply volumes from Alaska to California would decline by 61 percent from current levels. The CEC (1999) estimates that import of 168 to 257 million more barrels per year is expected by 2017 based on a very gradual decline in California's in-state supply. This estimate means 337 more tanker deliveries per year, about one per day.

Commercial and residential development are expected to grow along the coast with the influx of increased pollution discharges, loss of upstream and wetland habitat development in harbors and marinas, and increases in transportation corridors. This increase in development along the coastal strand has the potential to further stress already depressed fish stocks with added pollution and loss of habitat. Increases in development also have the potential to increase non-point discharges to rivers including agricultural contaminants and sediments. Loss of nearshore habitat due to increased sediment loads may affect squid habitat stability in the long-term.

The timing of fiber optic cable installation is unknown, however some operations have begun and while the majority are expected to be in the nearshore environment within the next five years (MMS 2001). Global West project includes seven landfalls between San Francisco and San Diego, while MCI Worldcom and AT&T would land at Montana de Oro State park in San Luis Obispo County. Effects include disturbing the sediments



for cable placement and physical sediment disturbance in deeper waters where the cable is not buried or over hard substrate.

Cumulative effects of the proposed project are not expected to be cumulatively considerable, that is, significant, when compared to the additional proposed projects described above.

