AUTHENTICATED
U.S. GOVERNMENT
INFORMATION
GPO

FEDERAL REGISTER

Vol. 76 Thursday,
No. 208 October 27, 2011

Part III

Department of Commerce

National Oceanic and Atmospheric Administration

50 CFR Part 226

Endangered and Threatened Wildlife and Plants: Final Rulemaking To Designate Critical Habitat for Black Abalone; Final Rule

DEPARTMENT OF COMMERCE

National Oceanic and Atmospheric Administration

50 CFR Part 226

[Docket No. 100127045–1313–02]

RIN 0648–AY62

Endangered and Threatened Wildlife and Plants: Final Rulemaking To Designate Critical Habitat for Black Abalone

AGENCY: National Marine Fisheries Service (NMFS), National Oceanic and Atmospheric Administration (NOAA), Commerce.

ACTION: Final rule.

SUMMARY: We, the National Marine Fisheries Service (NMFS), hereby designate critical habitat for the endangered black abalone under the Endangered Species Act (ESA). This designation includes approximately 360 square kilometers of rocky intertidal and subtidal habitat within five segments of the California coast between the Del Mar Landing Ecological Reserve to the Palos Verdes Peninsula, as well as on the Farallon Islands, Año Nuevo Island, San Miguel Island, Santa Rosa Island, Santa Cruz Island, Anacapa Island, Santa Barbara Island, and Santa Catalina Island. This designation includes rocky intertidal and subtidal habitats from the mean higher high water (MHHW) line to a depth of −6 meters (m) (relative to the mean lower low water (MLLW) line), as well as the coastal marine waters encompassed by these areas. We are not designating the specific area from Corona Del Mar State Beach to Dana Point, California, because we conclude that the economic benefits of exclusion from the critical habitat designation outweigh the benefits of inclusion and that exclusion of this specific area will not result in the extinction of the species. We also conclude that two of the specific areas proposed for designation (San Nicolas Island and San Clemente Island) are no longer eligible for designation, based on determinations that the U.S. Navy's revised integrated natural resource management plans (INRMPs) for these areas provide benefits to black abalone.

DATES: This rule becomes effective November 28, 2011.

ADDRESSES: The final rule, maps, and supporting documents used in preparation of this final rule, as well as public comments and information received, can be obtained via the Internet at: *http://swr.nmfs.noaa.gov/abalone,* the Federal eRulemaking Portal at: *http://www.regulations.gov* (in the box that reads ''Enter Keyword or ID,'' enter the Docket number for this rule, which is NOAA–NMFS–2010–0191, and then click the Search button), or by submitting a request to the Assistant Regional Administrator, Protected Resources Division, Southwest Region, NMFS, 501 West Ocean Blvd., Suite 4200, Long Beach, CA 90802–4213.

FOR FURTHER INFORMATION CONTACT: Melissa Neuman, NMFS, Southwest Region (562) 980–4115, or Lisa Manning, NMFS, Office of Protected Resources (301) 427–8466.

SUPPLEMENTARY INFORMATION:

Background

Under the ESA, we are responsible for determining whether certain species are threatened or endangered, and, to the maximum extent prudent and determinable, designating critical habitat for all endangered and threatened species (16 U.S.C. 1533). On January 14, 2009, we determined that the black abalone (*Haliotis cracherodii*) is in danger of extinction throughout all or a significant portion of its range and listed the species as endangered under the ESA (74 FR 1937). We issued a proposed critical habitat designation for the black abalone on September 28, 2010 (75 FR 59900). This rule describes the final critical habitat designation, including a summary of and responses to the public comments received and a description of the methods used to develop the final designation. The total estimated annualized economic impact for this final rule ranged from $158,000 to $3,886,000. This range represents our estimate of the potential economic impacts based on the best available information regarding the Federal activities that may be affected by this critical habitat designation and the potential range of modifications that may be required to protect critical habitat.

Black Abalone Natural History

The black abalone (*Haliotis cracherodii,* Leach, 1814) is a shallow-living marine gastropod with a smooth, circular, and black to slate blue colored univalve shell and a muscular foot that allows the animal to clamp tightly to rocky surfaces without being dislodged by wave action. Black abalone historically occurred from Crescent City, California, USA, to southern Baja California, Mexico (Geiger 2004), but today the species' constricted range occurs from Point Arena, California, USA, to Bahia Tortugas, Mexico, and it is rare north of San Francisco, California, USA (Morris *et al.* 1980), and south of Punta Eugenia, Mexico (pers. comm. with Pete Raimondi, University of California Santa Cruz (UCSC), in 2005).

Black abalone generally inhabit coastal and offshore island intertidal habitats on exposed rocky shores where bedrock provides deep, protective crevices for shelter (Leighton 2005). These complex surfaces with cracks and crevices in intertidal habitats appear to be crucial for juvenile recruitment and adult survival (Leighton 1959; Leighton and Boolootian 1963; Douros 1985, 1987; Miller and Lawrenz-Miller 1993; VanBlaricom *et al.* 1993; Haaker *et al.* 1995). Black abalone range vertically from the high intertidal zone to a depth of −6m (as measured from MLLW) and are typically found in middle intertidal zones. However, variation in wave exposure and where drift kelp (an important food item for black abalone) accumulates may result in animals being distributed primarily in high or low intertidal zones depending on the local conditions at particular locations (see definition of intertidal zones in Ricketts *et al.* 1985). Abalone are broadcast spawners, with a short planktonic larval stage (about 3–10 days) before settlement and metamorphosis (*e.g.,* McShane 1992). Larval black abalone are believed to settle on rocky substrate with crustose coralline algae, which serves as a food source for postmetamorphic juvenile black abalone, along with microbial and diatom films (Leighton 1959; Leighton and Boolootian 1963; Bergen 1971). As black abalone grow, they transition to feeding on attached macrophytes and drift algae. The main sources of mortality for black abalone have been historical overfishing and, more recently, mass mortalities caused by the disease known as withering syndrome. As a result of the disease, most black abalone populations in Southern California have declined by 90 to 99 percent since the late 1980s (VanBlaricom *et al.* 2009) and have fallen below estimated population densities necessary for recruitment success (Neuman *et al.* 2010).

Detailed information on the natural history of black abalone can be found in the final Biological Report (NMFS 2011a) and in the proposed rule to designate critical habitat (75 FR 59900; September 28, 2010). Additional information about the status of black abalone can be found in the 2009 status review report (VanBlaricom *et al.* 2009) and in the proposed (73 FR 1986; January 11, 2008) and final (74 FR 1937; January 14, 2009) rules to list black abalone as endangered under the ESA.

Summary of Comments and Responses

We requested public comments on the proposed rule to designate critical habitat for the endangered black abalone and on the supporting documents (*i.e.,* the draft Biological Report, draft Economic Analysis Report, and draft ESA Section 4(b)(2) Report). Public comments were received over a 60-day period ending on November 29, 2010. To facilitate public participation, the proposed rule and supporting documents were made available on our Southwest Region Web site (*http://swr.nmfs.noaa.gov*) and on the Federal eRulemaking Portal Web site (*http://www.regulations.gov*). Public comments were received via standard mail, email, fax, and the Federal eRulemaking Portal. The draft Biological Report and draft Economic Analysis Report were also each reviewed by three peer reviewers. All public comments and peer reviewer comments received have been posted on the Federal eRulemaking Portal (Docket Number: NOAA–NMFS–2010–0191).

We received 4,874 written public comments on the proposed rule and supporting documents, of which 4,843 were form letters submitted by supporters of the Center for Biological Diversity (CBD) and 20 were nearly identical to the form letters but included additional information. Comments were also received from the California Department of Transportation (Caltrans), the CBD and their supporters, the Department of the Navy, the Multi-Agency Rocky Intertidal Network (MARINe), NOAA's National Ocean Service National Marine Sanctuaries Program, the U.S. Army Corps of Engineers Los Angeles District, and five individual members of the public. In addition to the 4,863 identical or nearly identical letters submitted by supporters of the CBD in support of the proposed rule, eight other commenters were supportive of the proposed rule. One commenter was opposed to the proposed rule, and two were neither opposed nor supportive. The commenters and peer reviewers provided additional data to inform the biological and economic analyses, as well as comments regarding the methods used in these analyses. NMFS and the critical habitat review team (CHRT; a team of seven Federal biologists with relevant expertise) considered all of the public and peer reviewer comments in developing the final critical habitat designation. A summary of the public and peer review comments by major issue categories and the responses thereto are presented here. Similar comments were combined where appropriate.

Black Abalone Natural History

Comment 1: One commenter stated that although the work of Burton 2008 indicated little genetic structure over moderate distances (<100 km), demographically important dispersal for black abalone is believed to be limited based on larval behavior and recruitment dynamics and thus the likelihood of rapid natural recovery of populations lost to disease is very low.

Response: We agree that recent studies (Hamm and Burton 2000; Chambers *et al.* 2006; Gruenthal and Burton 2008) indicate low connectivity among black abalone populations, likely reflecting limited larval dispersal. We note that this information was included in the proposed rule (75 FR 59900; see section titled ''Population Structure'' on pg. 59901) and was also included in the draft Biological Report (NMFS 2010a).

Comment 2: One commenter requested that the terms high, mid, and low intertidal zones be defined. The commenter disagreed with the statement that the majority of black abalone are found in the high zone at exposed locations. The commenter stated that on the Channel Islands, black abalone occur in the high zone but are predominately in the mid-zone. The commenter also stated that at mainland sites, black abalone are found in the mid to low zones but not in the high zone.

Response: We have revised the description of black abalone habitat in this final rule and in the final Biological Report (NMFS 2011a) to recognize that black abalone typically occur in the middle intertidal zones, but that local variation exists depending on the conditions (*e.g.,* the level of exposure and where kelp may be accumulating). We also clarify that the high, middle, and low intertidal zones are defined according to Ricketts *et al.* (1985). On the U.S. West coast, the high intertidal zone is typically the zone above the mussel beds and extends from mean high water to the mean flood of the higher of the two daily lows, slightly below mean sea level. The middle intertidal zone extends from mean higher low water to MLLW, and may be covered and uncovered once or twice each day. The low intertidal zone is normally uncovered by minus tides only, extending from 0 to −0.6m (−1.8 feet) or so at Pacific Grove, and typically exposed for only a few hours each month. The critical habitat designation (extending from the MHHW line to −6m depth relative to the MLLW line) encompasses each of these three zones. We recognize that the definitions of the intertidal zones do not provide precise boundaries, but note that intertidal zones are very dynamic and thus are defined in somewhat general terms based on daily tidal fluctuations and the structure of the benthic community.

Comment 3: One commenter disagreed with the statement that the primary food species for black abalone in central California habitats is *Nereocystis leutkeana.* The commenter stated that although *Nereocystis* is found at black abalone monitoring sites between Santa Cruz and Point Conception, *Macrocystis* and *Egregia* are more prominent in these central California habitats.

Response: The CHRT agreed with the information provided by the commenter, which was based on observations by biologists in the Multi-Agency Rocky Intertidal Network (MARINe). We have incorporated this information in this final rule and in the final Biological Report (NMFS 2011a).

Comment 4: One commenter stated that based on MARINe's black abalone monitoring data, recruitment failure appears to occur when the adult density falls below one abalone per m^2, whereas the proposed rule states that recruitment failure occurs when adult density declines below 0.34 per m^2. The commenter requested that the citation for this 0.34 per m^2 value be provided.

Response: In the proposed rule, we cited a paper that was in press at that time but that has since been published (Neuman *et al.* 2010). We revised the final rule and final Biological Report (NMFS 2011a) to update the citation for this paper. To determine the critical density threshold below which black abalone recruitment failure is observed, Neuman *et al.* (2010) reviewed recruitment patterns in three long-term data sets for black abalone in California. Recruitment failure was found to occur when adult black abalone density declined to an estimated 0.25 to 0.46 per m^2. Thus, the estimated average minimum adult density below which local recruitment failure occurred at the three sites was 0.34 per m^2. This estimated average minimum adult density threshold is specific to the three sites evaluated and may differ for other locations.

Comment 5: One commenter stated that the proposed critical habitat designation should not be approved because it will not lead to the recovery of black abalone populations along the California coast. The commenter also recommended revisions to the proposed rule to emphasize that predation by sea otters was a major factor that caused the decline in black abalone populations and that continuing predation by sea otters has prevented recovery of black abalone populations. The commenter

cited a paper by Micheli *et al.* (2008) showing that abalone fishery closures and no-take reserves have been effective for allowing abalone populations to persist but that abalone populations have not recovered to levels comparable to those preceding the collapse of the abalone fisheries despite these protections.

Response: The comment letter was not clear regarding whether the commenter's objection to the proposed critical habitat designation and statement that the proposed designation will not lead to recovery of black abalone populations was based on: (a) The commenter's assertion that the continued threat of predation by sea otters on black abalone is preventing recovery of black abalone populations; (b) studies showing a lack of recovery of black abalone populations despite continued fishery closure and protection in no-take reserves; or (c) other reasons not stated by the commenter. Therefore, we can only address the commenter's concerns regarding predation by sea otters and the results of the Micheli *et al.* (2008) paper.

The proposed rule listed several factors that contribute to mortality of black abalone, including predation by other species such as sea otters (see ''Mortality'' section, pg. 59902 in the proposed rule (75 FR 59900, September 28, 2010)). The proposed rule also stated that predicting the relative impacts of each of these factors on long-term viability of black abalone is difficult without further study. The commenter did not provide references to support the statement that sea otter predation was a major factor contributing to black abalone declines and that continued sea otter predation has prevented recovery of populations. However, based on the best available data, the 2009 status review report for black abalone (VanBlaricom *et al.* 2009) identified historical overfishing and mass mortalities associated with withering syndrome as the primary factors contributing to the recent declines in black abalone populations. The potential impact of sea otter predation on the recovery of black abalone populations is unknown, but the following observations indicate that sea otter predation was not and is not a major source of mortality for black abalone: (1) Sea otters were absent from southern California during the widespread decline of black abalone in that region; (2) the current last foothold for black abalone (*i.e.,* central and north-central California habitats) directly overlaps with the current range of sea otters; and (3) one of the only places in southern California where black abalone populations have been increasing and where multiple recruitment events have occurred since 2005 (*i.e.,* San Nicolas Island) is also the only place south of Point Conception where a growing population of southern sea otters exists, indicating that black abalone populations can recover and remain stable in the presence of sea otters. Micheli *et al.* (2008) identified high rates of natural mortality as well as potential illegal harvest of abalone as factors that have likely kept abalone populations along the central California coast from recovering to levels comparable to those attained during the 1950s to 1960s, preceding the collapse of the abalone fishery. However, there is recognition that the abalone population levels in the 1950s and 1960s may not represent historical baseline abundances, because they were attained during a period when sea otter populations were extremely depressed. Micheli *et al.* (2008) states that ''[t]he current levels of abalone populations in central California may reflect conditions prior to both fishing and the near-elimination of sea otters from this region, characterized by intense otter predation and low but stable densities of abalones.'' Thus, the best available data do not support the idea that sea otter predation was a major factor in the decline of black abalone populations or that it will inhibit the recovery of the species. In addition, the purpose of the critical habitat designation is to protect habitats important for black abalone conservation. Although we do not expect the designation to directly address the issue of sea otter predation on black abalone, we do expect this designation to contribute to conservation of black abalone by protecting habitats necessary to support species recovery, despite uncertainties regarding the relative impacts of natural mortality on long-term viability of populations.

Geographical Area Occupied by the Species

Comment 6: One commenter noted that within the areas proposed for designation, the habitat consists of a mixture of habitat suitable for black abalone (*e.g.,* rocky substrates) and habitat unsuitable for black abalone (*e.g.,* sandy beach). The commenter stated that the proposed critical habitat designation should be redone to only include those areas with habitat suitable for black abalone.

Response: We agree with the commenter that the areas proposed for designation within the occupied geographic range of black abalone consist of a mixture of rocky habitats that are suitable to support black abalone and expanses of sandy habitat that are not suitable to support black abalone. Thus, the essential features identified for black abalone are unevenly dispersed throughout the specific areas proposed for designation. As stated in the draft Biological Report (NMFS 2010a), data are available to map and identify general areas of rocky habitat within these specific areas. However, as permitted under our regulations (50 CFR 424.12 (d)), we selected to draw a more inclusive area around habitats in close proximity to one another that met the requirements for designation as critical habitat. This allowed for a more manageable evaluation of areas. In addition, due to the risk of illegal harvest, the CHRT did not think it prudent to identify each individual rocky reef as a specific area in order to avoid disclosing the location of survey sites where black abalone populations have been found. Instead, the CHRT delineated ten segments of the California coast and ten offshore islands as specific areas to consider for designation, based on the location of survey sites where black abalone have been observed as well as features of the habitat. The intent of the proposed designation was not to designate all habitat types within the specific areas as critical habitat, but to designate the habitat within the specific areas that contain features essential to the conservation of the species (*e.g.,* rocky habitat). The final rule has been revised to clarify that critical habitat includes only the rocky habitats (and the coastal marine waters above the benthos; see also Response to Comment 5) within the designated specific areas.

Delineation of Specific Areas Considered for Designation

Comment 7: One commenter stated that the proposed critical habitat designation neglected important habitat for the planktonic larval stages of black abalone because the designation only included rocky intertidal habitat and did not include the marine waters in which larval black abalone occur. The commenter recommended the designation of certain ocean water habitat in order to protect the larval stage of black abalone. The commenter suggested a mechanism for determining whether a particular volume of water is occupied by larval and juvenile black abalone, noting that habitat need not be occupied continuously or at all to be designated as critical habitat. The commenter also recommended consideration of spatially and temporally dynamic designations, such

as an intermittent critical habitat designation (*e.g.,* areas designated as critical habitat seasonally or only during breeding periods) or mobile critical habitat designations (*e.g.,* designating critical habitat that moves along with the species).

Response: We have revised the final rule to clarify that the designation includes not only coastal rocky habitats (from MHHW shoreward to the −6m depth contour relative to MLLW) within the designated specific areas, but also the marine waters above the rocky benthos within these areas. As indicated by the inclusion of water quality and nearshore circulation patterns on the list of proposed primary constituent elements (PCEs), we did intend for the designation to include not just the benthic substrate in the areas proposed, but also the water above it. Although not much is known about larval distribution, laboratory experiments with related species (Leighton 1972 and 1974) indicate that larvae are distributed throughout the water column down to approximately −6m relative to MLLW, and possibly beyond.

We note that the commenter's recommendation to consider a spatially or temporally dynamic designation would likely reduce the protections afforded to the species by the critical habitat designation. By designating habitat as critical habitat only during specific seasons, or only when the species is present, we would be missing an important aspect of what critical habitat is and the protections it affords a species by protecting its habitat even when the species is not present. This protection is important for maintaining the habitat for those times of the year when the species is using the habitat. This is one of the distinguishing features of a critical habitat designation versus the protections provided to the species under the listing.

Comment 8: One commenter noted several incorrect citations for data collected at long-term monitoring sites along the California coast. The commenter provided the correct citations and recommended text to explain the history of the long-term monitoring sites and their establishment. The commenter also provided updated information on black abalone monitoring activities and data in 2009 and 2010 for Point Reyes National Seashore, Golden Gate National Recreation Area, and Año Nuevo Island.

Response: We have revised the final rule and final Biological Report (NMFS 2011a) by: (a) Including a history of the long-term monitoring sites and their establishment; (b) correcting the citations for the long-term monitoring sites; and (c) updating the black abalone monitoring data for Point Reyes National Seashore, Golden Gate National Recreation Area, and Año Nuevo Island.

Activities That May Affect Black Abalone Critical Habitat

Comment 9: One commenter stated that while the proposed rule recognizes that ocean acidification may be a threat to black abalone habitat, it does not identify the specific activities that may contribute to ocean acidification. The commenter stated that the following categories of activities contribute to ocean acidification and recommended that ocean acidification be identified as a threat to the PCEs for these activities: National Pollutant Discharge Elimination System (NPDES)-permitted activities, coastal development, construction and operation of desalination plants, construction and operation of liquefied natural gas projects, and mineral and petroleum exploration and extraction. The commenter also provided several references with information on the effects of ocean acidification on marine ecosystems and organisms and strategies for monitoring, assessing, and addressing ocean acidification.

Response: The proposed rule identified ocean acidification as a potential factor imposing mortality on black abalone and stated that activities that exacerbate global climate change (*e.g.,* fossil fuel combustion) contribute to ocean acidification. We recognize that several of the activities that may affect black abalone habitat (such as those listed by the commenter) may contribute to fossil fuel combustion and carbon emissions, thereby contributing to ocean acidification. Thus, in the proposed rule, we created a broad category of activities called ''Activities that lead to global climate change,'' to account for these and other activities that may result in increased carbon emissions and the potential effects resulting from these increased emissions. For this category of activities, we identified ocean acidification as a threat to the water quality, food resources, and settlement habitat PCEs. We mentioned that ocean pH values outside of the normal range (*i.e.,* normal pH range = 7.5 to 8.5) may cause reduced growth and survivorship in abalone and that increasing partial pressure of carbon dioxide may reduce abundance of coralline algae (an important food resource and component of settlement habitat for newly settled abalone) (see Table 1, pg. 59918, in the proposed rule (75 FR 59900; September 28, 2010).

Unlike the other activities listed by the commenter, for which the link to ocean acidification is more indirect (*e.g.,* coastal construction involves fossil fuel combustion and thus increased carbon emissions, which contribute to ocean acidification), NPDES-permitted activities may directly affect the pH of marine waters if permitted discharges alter the pH of receiving waters. Thus, we have revised this final rule and the supporting document to include ocean acidification as a threat to the food resources and water quality PCEs for NPDES-permitted activities.

Comment 10: One commenter provided additional information regarding the potential impacts from dredging on black abalone habitat, stating that dredging activities would not be expected to have direct or indirect impacts on black abalone habitat. The commenter explained that dredging activities would not ordinarily take place within black abalone habitat, because these activities are restricted to navigational channels and features associated with navigation, which consist of subtidal, soft bottom habitats. The commenter also reasoned that indirect effects of dredging activities (*e.g.,* from increased turbidity or deposition) on black abalone habitat were not likely because the distances between dredge sites and black abalone habitat are great enough to avoid such impacts. If necessary, however, the commenter stated that projects can be conditioned to avoid direct impacts and measures can be implemented to control indirect impacts (*e.g.,* closed buckets or turbidity curtains to control turbidity). Finally, the commenter recommended that ''requirements to treat (detoxify) dredge spoil'' be deleted from the list of possible modifications for dredging and disposal activities, because the Clean Water Act prohibits the discharge of sediments toxic to the environment and thus treatment is not a feasible modification.

Response: Consistent with the information provided by the commenter, the draft Economic Analysis Report (NMFS 2010b) recognized that ''most of the dredging projects in California take place in rivers or in bays, to allow for vessels with deep drafts to safely navigate or maneuver. These types of areas are not being considered for designation. Thus, these data indicate that there are currently no dredging and disposal activities occurring in the specific areas.'' The draft and the final Economic Analysis Reports (NMFS 2010b and NMFS 2011b) state that currently, no dredging and disposal activities are known to occur within the specific areas

considered for designation. Therefore, no costs were identified for dredging and disposal activities as a result of the critical habitat designation. The proposed and final rules and supporting documents still include and discuss dredging and disposal activities, however, to inform Federal agencies of the potential effects on black abalone critical habitat if the footprint of the activities were to overlap with rocky habitat within the specific areas.

As the commenter stated, the Clean Water Act, along with the Marine Protection, Research, and Sanctuaries Act of 1972, prohibits the discharge or disposal of dredged material in aquatic and marine waters if the material does not meet Environmental Protection Agency (EPA) and U.S. Army Corps of Engineers (USACE) regulations and standards regarding contaminants. These regulations and the current location, depth, and use of designated ocean disposal sites likely minimize impacts on the water quality PCE for black abalone. As recommended by the commenter, we have revised the possible modifications described for dredging and disposal activities by removing ''requirements to treat (detoxify) dredge spoil'' and replacing it with ''requirements to monitor dredge spoil for specific contaminants that may affect black abalone.'' This revised language is intended to inform Federal agencies that if the disposal of dredge spoil may affect black abalone critical habitat, then they may be required to monitor levels of contaminants within the potentially affected area in order to address impacts on the water quality PCE. The specifics of the monitoring activities (*e.g.,* contaminants of interest, methods, frequency, duration), as well as what actions would be taken if adverse effects on black abalone and its habitat are found, would be determined on a case-by-case basis through the consultation process under section 7 of the ESA.

Comment 11: One commenter stated that the designation of critical habitat for black abalone has the potential to affect the routine issuance of permits for currently permitted activities in the Gulf of the Farallones, Monterey Bay, and Channel Islands National Marine Sanctuaries. The commenter requested that NMFS provide clear, concise advice and guidance on impacts that NMFS believes may affect the species and its critical habitat. The commenter also expressed concern regarding the expected time frame of one year or more for NMFS to issue permits for activities that may impact black abalone, stating that such a time frame would not be consistent with the National Marine Sanctuaries' time frame for evaluating and issuing permits. The commenter requested a formal meeting between staff from NMFS and the National Marine Sanctuaries to establish a framework, protocol, and plan for evaluating activities that may affect black abalone and its critical habitat.

Response: Under section 7 of the ESA, Federal agencies must insure that actions they fund, permit, or carry out are not likely to jeopardize the continued existence of threatened or endangered species, or result in the destruction or adverse modification of designated critical habitat. The proposed rule (75 FR 59900; see section on ''Special Management Considerations or Protection'') and draft Economic Analysis (NMFS 2010b) identified categories of activities that may affect black abalone critical habitat and therefore may be subject to such an analysis under section 7 of the ESA. The proposed rule and draft Economic Analysis also describe the nature of the threats posed by those activities to black abalone habitat and the potential modifications to those activities that may be required to avoid or minimize adverse effects on black abalone critical habitat. That list of activities and their descriptions provide information that can be used to evaluate activities for potential effects on black abalone and its habitat; however, NMFS recognizes that there may be additional activities that we are not aware of at this time that may affect black abalone critical habitat. We understand the commenter's concern regarding the need for guidance on what impacts may or may not affect black abalone and its habitat. However, determining whether a Federal action and its impacts may affect black abalone and its habitat requires an analysis of the details of the action, such as the location, duration, nature, scope, frequency, and time frame of the action and its impacts. Thus, this determination must often be made on a case-by-case basis given the details of each action. NMFS and National Marine Sanctuaries staffs have agreed to coordinate regarding upcoming actions, to provide technical assistance to Federal agencies undertaking, authorizing, or funding an action in determining whether the action may affect black abalone and its habitat. We also clarify that should it be determined that a Federal action may affect black abalone and its habitat, the action would be subject to consultation under section 7 of the ESA. The result of this consultation would not be a permit, but an analysis of whether the Federal agency has insured that the action is not likely to jeopardize black abalone and is not likely to result in the destruction or adverse modification of critical habitat. These consultations would be subject to the time frames specified in section 7 of the ESA and implementing regulations (typically 135 days). Regardless of the critical habitat designation for black abalone, consultations under section 7 of the ESA were and will be required for any Federal action that may affect black abalone or any other species listed under the ESA. The designation of critical habitat for black abalone does not alter the consultation time frames established under the ESA or implementing regulations.

Comment 12: Two commenters stated that the term ''sidecasting'' is vague, undefined, and brings to mind the tossing of material off the highway with no subsequent management of the material. One of the two commenters recommended that the term ''sidecasting'' be replaced with the term ''sediment disposal'' or another term that better represents the range of methods used to dispose of excess sediment. The other commenter recommended that the term ''sidecasting'' be more clearly defined as direct sediment input or deposition into a water body. The commenters provided information explaining that excess sediment generated during road maintenance, repair, and construction activities is disposed of in approved areas and managed to minimize impacts to marine resources, using methods such as compaction of the material followed by revegetation. The commenters also provided information on three existing coastal development permits, stating that the management and disposal of excess sediment under these permits provides for public safety on California Highway 1 and is conducted in such a way as to best mimic nature, in order to minimize detrimental effects to the marine environment.

Response: In response to the comments received, we revised the final rule by removing the term ''sidecasting'' and replacing it with the term ''sediment disposal activities associated with road maintenance, repair, and construction.'' We also revised the description of this activity to clarify that it involves the management and disposal of excess sediments generated from road maintenance, repair, and construction activities, with the material being placed in disposal areas that have been approved by the appropriate authorities and managed using methods (e.g., compaction and revegetation) to minimize the movement of sediment into the marine environment. We clarify

that the sediment disposal activities of concern are those that result in destruction or adverse modification of black abalone habitat (e.g., by increasing sediment input into coastal rocky habitats). If sediment disposal activities may result in the destruction or adverse modification of black abalone critical habitat, then the Federal agency funding, authorizing, or carrying out those activities would be required to consult with NMFS under section 7 of the ESA.

Comment 13: One commenter stated that the potential modification to sidecasting activities of placing excess material at a stable site at a ''safe distance'' from rocky intertidal habitats was too vague. The commenter stated that the ''safe distance'' requirement is subject to interpretation and provides an unacceptable level of uncertainty for materials management on Highway 1.

Response: We acknowledge that the ''safe distance'' requirement is not clearly defined, but also recognize that the critical habitat designation is not the appropriate stage at which to define what that safe distance would be for the placement of sediments to avoid impacts to rocky intertidal and subtidal habitat. The distance at which excess materials would need to be placed to avoid impacts to rocky intertidal and subtidal habitat would depend on several factors, including the volume and characteristics of material to be placed at the site, the time of year, specific features of the site, and what management methods would be used (*e.g.,* compaction, revegetation). These factors may vary and would need to be evaluated on a case-by-case basis during ESA section 7 consultations to determine the appropriate safe distance.

Comment 14: One commenter agreed that the prediction of potential effects from coastal wave energy projects on black abalone populations is highly speculative. The commenter stated that MARINe is planning to monitor changes in physical parameters (*e.g.,* pH, wave intensity, and temperature) in rocky intertidal habitat across the range of black abalone. The commenter stated that these data may provide information on changing physical parameters for black abalone resulting from climate change and coastal tidal and wave energy projects.

Response: We intend to collaborate with MARINe on obtaining data to assess the effects of climate change and coastal tidal and wave energy projects on black abalone habitat.

Comment 15: One commenter asked why agricultural irrigation was identified as an activity that may affect the PCEs on Anacapa Island (Specific area 16), stating that irrigation on Anacapa Island is limited to a greenhouse area and does not run-off the island.

Response: In order to identify and estimate the acreage of irrigated farmland within each specific area, the economic analysis used data on Prime Farmlands, Farmlands of Statewide Importance, and Farmlands of Local Importance from the US Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS) Soil Survey Geographic Database (SSURGO). Based on the SSURGO data, irrigated farmland was identified on Anacapa Island and therefore the proposed rule identified agricultural irrigation as an activity of concern for this specific area in the proposed rule. However, we have since been informed by the National Park Service (NPS) that irrigation activities on Anacapa Island are limited to a greenhouse where native plants are grown for a habitat restoration project (pers. comm. with Dan Richards, CINP, on September 21, 2011). Water use is conservative and limited to occasional hand watering, with water in the greenhouse recaptured and recycled. Based on the new information provided by the NPS, we have determined that agricultural irrigation is not an activity of concern on Anacapa Island and have revised this final rule and the final economic analysis report to remove agricultural irrigation as an activity that may affect the PCEs on Anacapa Island. We also revised the economic analysis to remove the economic impacts associated with agricultural irrigation activities on Anacapa Island (estimated to range from $0 to $21,900, with a midpoint of $10,950). As a result, the total annualized economic impacts estimate across all activities for Anacapa Island decreased.

Unoccupied Areas

Comment 16: One commenter disagreed with NMFS' determination that while the unoccupied specific areas identified for black abalone may be essential for conservation, there is currently insufficient data to conclude that any of the unoccupied areas are essential for conservation. The commenter recommended that any unoccupied areas with favorable black abalone habitat should be designated as critical habitat, particularly unoccupied areas to the north of the species' current range that may provide cooler waters and support for populations forced to shift northward due to ocean warming and the spread of withering syndrome. The commenter stated that any areas that can support black abalone and shelter the species from withering syndrome are essential for conservation of black abalone, regardless of whether they are currently occupied.

Response: In order to designate a presently unoccupied specific area as critical habitat, the Secretary must find that: (a) The occupied specific areas are ''inadequate to ensure the conservation of the species'' (50 CFR 424.12); and (b) the unoccupied specific areas are ''essential for conservation of the species'' (16 U.S.C. 1532). The ESA's definition of critical habitat and its implementing regulations preclude the designation of any unoccupied habitat identified for the species unless the above determinations are made. The CHRT identified three unoccupied specific areas to consider for designation. The three unoccupied specific areas were delineated based on historical black abalone presence data and features of the habitat. At this time, we do not have predictive models or data to determine how climate change may affect current, historical, and potential black abalone habitat and how black abalone populations may respond to these effects, particularly how habitats and biological communities may shift with climate change. Given these uncertainties, we cannot at this time determine whether the unoccupied specific areas delineated by the CHRT would support black abalone populations in the future or whether they are essential for conservation. Nor are we able to conclude that the specific areas within the occupied geographic area are inadequate to ensure the conservation of the species. We note, however, that NMFS will continue to monitor the status of black abalone populations and habitats to determine how the species is responding to conditions over time. The ESA also requires status review updates for ESA-listed species every five years. As more information becomes available in the future, the critical habitat designation may be revised.

Critical Habitat Boundaries

Comment 17: One commenter recommended two revisions to clarify the lateral extent of designated critical habitat and what habitats are designated. First, the commenter recommended that a depth reference be provided wherever depths are given (*e.g.,* a depth of −6m relative to the MLLW line). Second, the commenter recommended that the description of critical habitat be revised to include not just rocky intertidal habitat, but both rocky intertidal and subtidal habitats to a depth of −6m MLLW, because habitat from approximately −1m to −6m

MLLW would not be considered intertidal but is subtidal.

Response: We have made the suggested changes by revising the language in this final rule and in the supporting documents to clarify that the critical habitat designation includes rocky intertidal and subtidal habitats from MHHW to a depth of −6m, measured relative to MLLW.

Comment 18: One commenter recommended that the specific areas proposed for designation should be delineated by latitude and bathymetric specifications (e.g., MHHW), but should not be delineated by longitude. The commenter stated that this would allow the critical habitat designation to continue providing protection to black abalone habitat should the location of that habitat shift due to sea level rise associated with the effects of climate change.

Response: In the proposed rule, we provided latitude and longitude coordinates to define the northern and southern boundaries of each specific area along the California coast. The latitude and longitude coordinates provided were not meant to also define the seaward and shoreward boundaries of the specific areas. We have revised the regulatory text in this final rule to clarify that the latitude and longitude coordinates define the northern and southern boundaries of the designated critical habitat areas, whereas the seaward and shoreward boundaries are defined by the following bathymetric specifications: The MHHW line (shoreward boundary) and the −6m depth contour relative to the MLLW line (seaward boundary).

Economic Impacts Analysis

Comment 19: One commenter stated that the use of a ''mean'' in developing the cost estimates needs to be explained. Specifically, the commenter stated that because the mean reported in the economic analysis is actually the midpoint of a low cost and high cost range, the implicit assumption is that the probable distribution of costs is symmetric (and uniform, if there are no prior expectations to indicate that any value is more likely than any other) between the low and high cost estimates, which is an acceptable assumption as long as the low and high cost estimates are not hugely different. The commenter recommended that the final economic report should state the assumptions made in using the midpoint as the ''mean'' or expected level of costs.

Response: The commenter is correct that the mean reported in the draft Economic Analysis Report (NMFS 2010b) is actually the midpoint of a low cost and high cost estimate. Because the economic analysis for this designation involves analyzing the economic impacts of a regulation that is not yet in place, empirical data are not available to inform the analysis. Instead, the analysis uses the best available data (*e.g.,* from consultations on similar activities or species) to estimate the likely range of economic impacts associated with the critical habitat designation. Lacking empirical data, we made the assumption that the distribution of costs is symmetric and uniform within this range. We then used the midpoint (a measure of central tendency) between the low cost and high cost estimates as the representative cost estimate. In this analysis, the midpoint also represents the ''mean'', based on our assumption of a symmetric and uniform distribution of costs. For clarity, however, we have revised this final rule and the final Economic Analysis Report (NMFS 2011b) to remove the term ''mean'' and replace it with the term ''midpoint.'' The following paragraph was also added to section 1.4.6 in the final Economic Analysis Report (NMFS 2011b) to explain the assumptions made in the economic analysis regarding the ''midpoint'' or ''mid'' annualized economic impact estimate: ''In almost all cases, a range of possible modification costs is presented. Because the data sources for the cost estimates do not constitute a random sample, an average over the range of estimated costs cannot be used as the ''representative'' estimate. This analysis therefore assumes that the endpoints of the range represent the minimum and maximum values of a symmetric cost distribution, and uses the midpoint of the range as the representative cost estimate.''

Comment 20: One commenter recommended that, in light of the recent economic climate, the discount rates used in the economic analysis should be reanalyzed.

Response: OMB Circular A–94 states that a 7 percent discount rate should be used as a base-case for regulatory analysis to approximate the marginal pre-tax rate of return on an average investment in the private sector in recent years (before 1992). OMB Circular A–4 adds that estimates using a 3 percent discount rate should also be provided for regulatory analyses. Thus, the economic analysis provides present discounted values using discount rates of 3 percent and 7 percent. Given the present low interest rate environment, we consider the present values discounted at 3 percent to better reflect current economic conditions. Appendix D of the economic analysis report presents a sensitivity analysis of our assumptions by comparing the present values discounted at 3 percent and 7 percent with those discounted at 2.1 percent.

We also note that in the draft economic analysis report, the annualized impacts were incorrectly labeled as having been discounted at 7 percent within the report and at 3 percent in the sensitivity analysis (Appendix D). The discount rates were only used to calculate present values and were not applied to calculate annualized impacts. In the final economic analysis report, we have removed the text ''discounted at 7 percent'' and ''discounted at 3 percent'' from the tables that present annualized impacts. In addition, we have revised Appendix D to remove the tables of annualized impacts from Appendix D and to include only the table of present discounted values (comparing values discounted at 3, 7, and 2.1 percent discount rates).

Comment 21: One commenter expressed concern that small businesses in the specific areas proposed for designation may experience large economic impacts and recommended that a more detailed economic analysis be conducted to consider the impacts to all types of potentially affected small businesses. The commenter also stated that the proposed rule said that most small businesses are outside of the limited protected area. The commenter felt this statement was speculative and urged NMFS to confirm this statement using county data.

Response: NMFS refers the commenter to the Initial and Final Regulatory Flexibility Analyses in the draft and final Economic Analysis Reports (Appendix E in NMFS 2010b and 2011b). We used U.S. Census Bureau county data and NAICS codes to identify the number of small businesses that may be affected by the critical habitat designation for each activity type. We were not able to analyze the impacts to all types of small businesses, however, because we were able to attribute a NAICS code (or codes) to only 10 of the 17 activities. Thus, we were only able to estimate the number of and economic impacts to small businesses that may be affected for those 10 activities.

Although the proposed rule stated that ''all of the identified small businesses are unlikely to be located in close proximity of the specific areas,'' the economic analysis did incorporate county data and analyzed the impacts to potentially affected small businesses identified throughout the counties

adjacent to the specific areas (see section titled ''Regulatory Flexibility Act'' on pg. 59925 in the proposed rule (75 FR 59900; September 28, 2010)). Thus, the analysis provides a maximum number of small businesses that could be affected for the 10 types of activities analyzed. We could not provide a more precise estimate of the number of potentially affected small entities, because business activity data is maintained at the county level.

Comment 22: One commenter provided additional information for analyzing the economic impacts to ''sidecasting'' activities (revised name: ''Sediment disposal activities associated with road maintenance, repair, and construction; see Response to Comment 12). Specifically, the commenter provided data on the costs associated with sidecasting material versus hauling material off site (the potential modification analyzed in the draft Economic Analysis (NMFS 2010b) for activities conducted under the Waddell Bluffs Talus Disposal project and under the Basin Complex Fire Debris Material Management project.

Response: We have incorporated the information into the final Economic Analysis (NMFS 2011b) for sediment disposal activities associated with road maintenance, repair, and construction.

Comment 23: One commenter recommended that power plants be treated as a special case, as the estimates of the ''mean'' or midpoint cost are highly sensitive to the assumptions made regarding the distribution of costs within the range of estimated costs (see Comment 19 and Response above). The commenter questioned whether the low cost estimate of $26,000 was just as likely as the high cost estimate of $75 million. The commenter stated that the probable distribution of costs between the high and low cost estimates needs to be more explicitly addressed.

Response: The Diablo Canyon Nuclear Power Plant (DCNPP; located in specific area 10) was the only power plant identified within the specific areas that may be affected by the critical habitat designation. As described in the proposed rule and draft economic analysis report, the estimated economic impacts to the DCNPP were highly uncertain. The high cost estimate was based on the costs required to retrofit the DCNPP with closed-system wet cooling towers. The low cost estimate was based on the costs required to comply with temperature control criteria in order to minimize the effects of thermal effluent on the black abalone habitat. In the proposed rule, the estimated economic impacts ranged from $26,500 to approximately $150 million, and we noted that the high cost estimate was likely an overestimate, because there may be less costly and more feasible actions that could be taken to address effects on black abalone habitat. Since the proposed rule, we have obtained additional information from the EPA and California State Water Resources Control Board (SWRCB) that have led us to revise the analysis of economic impacts to the DCNPP. As a result of these revisions, we have concluded that the designation of black abalone critical habitat is not likely to have incremental economic impacts on the DCNPP (*i.e.,* the revised estimated economic impact is zero). In the following paragraphs, we describe the additional information received and the revisions leading to this conclusion.

To address the high level of uncertainty associated with the estimated economic impacts to the DCNPP in our proposed rule, we investigated alternative methods that could feasibly be employed to minimize or eliminate the effects of thermal effluent. We also sought out information from the EPA and the SWRCB to increase certainty regarding baseline protections provided to the habitat under existing regulations. The additional information obtained led us to revise the economic impact analysis for the DCNPP.

Further investigation of potential modifications to DCNPP suggested there is a high degree of uncertainty regarding the economic and technical feasibility of the modifications originally considered. Conclusions regarding several modifications are subject to evaluation studies to be conducted by the DCNPP in cooperation with the SWRCB. The studies are planned for 2012. In the proposed rule, we considered low cost modifications associated with compliance with NPDES permitting requirements (*i.e.,* temperature control criteria), including alterations to plant operations to reduce the intake of water and thus the amount of water discharged. However, additional information provided by the EPA indicated that such modifications are not applicable to the DCNPP. Altering operations to reduce water intake when the facility is not producing power would not work at the DCNPP, because it is a nuclear power plant and needs to take in water for cooling purposes even when the plant is not producing power (pers. comm. with Paul Shriner, EPA, on October 4, 2011). Thus, the low cost modifications analyzed in the proposed rule are considered to be infeasible based on the best available information.

In the proposed rule, we also considered the high cost modification of retrofitting the DCNPP from a once-through cooling system to a closed-cycle cooling system. While this option may address the issue of thermal effluent by reducing the volume of heated water that is discharged, it would not directly address the effects of thermal effluent. Further, a study conducted by the Central Coast Regional Water Quality Control Board (Central Coast RWQCB 2005) concluded that closed-cycle cooling systems would not be feasible for the DCNPP, because the massive physical area required for the cooling towers does not exist near the DCNPP. Although a report prepared for the California Ocean Protection Council (OPC) in 2008 (Tetra Tech Inc. 2008) stated that retrofitting to a closed-cycle cooling system is feasible at the DCNPP, it also noted that the location and layout of existing structures at the DCNPP ''complicates the identification of suitable areas in which to place cooling towers'' and acknowledges that considerations outside the scope of the study may limit the practicality or overall feasibility of a wet cooling tower retrofit at the DCNPP. Hence, the feasibility of a wet cooling tower retrofit at the DCNPP is questionable.

Other options that more directly address the issue of thermal effluent and that would likely be associated with lower costs include the use of helper cooling towers, in which water is cooled prior to discharge, but not re-circulated, thus reducing the costs compared to closed-system cooling towers, and the re-routing of the heated discharge further offshore, rather than discharging directly into Diablo Cove (pers. comm. with Paul Shriner, EPA, on October 4, 2011). The feasibility of installing helper cooling towers has not yet been evaluated, nor will it be considered in the evaluation study planned in 2012. Therefore, the feasibility of this modification remains uncertain. Similar to closed-system wet cooling towers, the use of helper cooling towers may be constrained by limited space in the area around DCNPP, depending on the size of the towers that would need to be constructed. In addition, the Central Coast RWQCB's (2005) study concluded that moving discharge structures offshore is not feasible for the DCNPP, given the bathymetry of the habitat, which is steep, rocky, and rapidly drops off in depth offshore. Therefore, these two potential modifications are considered to be infeasible, based on the best available information.

Based on this additional information, we have determined that neither the low costs (associated with altering power plant operations to reduce water intake and discharge, in compliance with

temperature control criteria) nor the high costs (associated with retrofitting the DCNPP with closed-system wet cooling towers) analyzed in the proposed rule can be reasonably expected to be incurred due to the black abalone critical habitat designation. In addition, we note that regulations under the CWA provide a high level of baseline protection for black abalone critical habitat. The SWRCB has been delegated the authority to implement the federal Clean Water Act (CWA). Section 316(a) of the CWA requires the thermal component of a discharge be limited, taking into account the interaction of this thermal component with other pollutants, to assure the protection and propagation of balanced, indigenous populations of shellfish, fish, and wildlife in the receiving water. California State's Water Quality Control Plan for the control of temperature in coastal waters requires that elevated temperature effluent from existing discharges, such as the DCNPP's discharge, ''shall comply with limitations necessary to assure protection of the beneficial uses and areas of special biological significance.'' Thus, under Section 316(a) of the CWA, the DCNPP would already be required to take measures to address the effects of the facility's discharge on water quality. Based on this information, we determined that it is unlikely that this critical habitat designation would require modifications above and beyond what would already be required under the existing regulations. Therefore, we conclude that this designation is not likely to result in incremental impacts to the cost of operating the DCNPP.

This final rule and the supporting documents have been revised with the economic impact estimate of $0 for the DCNPP. As a result of this revision, the total mid-annualized economic impact estimate for specific area 10 decreased from about $75.5 million to about $456,000 and specific area 10 is no longer eligible for exclusion based on economic impacts (see section on ''Benefits of Exclusion based on Economic Impacts and Final Exclusions'').

Comment 24: One commenter suggested that Table 1.4–1 (summarizing the basis for the incremental scores) of the draft Economic Analysis Report (NMFS 2010b) be revised to clarify that the incremental scores can be affected by other baseline protections, and not just by an overlap with existing critical habitat designations. For example, the commenter noted that the incremental score can be affected by an overlap with other existing protected areas, such as National Marine Sanctuaries (NMS). In addition, the commenter recommended including a table that summarizes the application of the guidelines to each activity and the resulting incremental score(s).

Response: The baseline protections, including NMS regulations, are represented on Table 1.4–1 in the heading ''Existing Federal, state, and local standards and regulations.'' We included additional text in Section 1.4.4 of the final Economic Analysis Report to make this more explicit. In addition, Section 2 of the draft and final Economic Analysis Reports includes a detailed description of the economic analysis for each category of activity considered. Included in these descriptions is an explanation of how the incremental scores were determined for each category of activity. Because the baseline protections differ between specific areas, the incremental scores also differ between specific areas for each category of activity. Rather than creating one table listing the incremental scores for each specific area and each category of activity, we provide summary tables for each category of activity, listing the incremental scores for each specific area and the resulting estimated economic impacts.

Comment 25: One commenter stated that small boat wrecks and associated oil spills may not be captured in the economic analysis, because the analysis focuses on medium to large spill events. The commenter recommended that small boat wrecks should be included in the analysis of oil and chemical spills and vessel grounding incidents because these wrecks can result in the discharge of fuel and in physical damage to habitat. As an example, the commenter stated that in 1995 a 40-foot vessel wrecked at Point Reyes Headland within the area of proposed black abalone critical habitat and discharged 400 gallons of diesel into the marine environment. The commenter stated that the cumulative effects of small incidents could add up to a medium-sized spill, with as many as ten boat wrecks a year occurring at Point Reyes National Seashore. The commenter provided additional data on small boat wrecks and associated oil spills in the Point Reyes National Seashore for the years 1995 through 2005.

Response: In response to this comment, we re-evaluated our analysis of the economic impacts to oil and chemical spill response activities in Section 2.7 of the economic analysis report to incorporate the additional information provided by the NPS on small boat wrecks and associated oil spills in the Point Reyes National Seashore (in Specific Area 2). This re-evaluation led us to revise our approach to the economic analysis for oil and chemical spill response activities. In the draft economic analysis prepared for the proposed rule, we presented a quantitative estimate of the economic impacts to oil and chemical spill response activities. We used a model developed by Etkin (2000) and populated with data from past spill events (*e.g.,* location, spill size, amount of shoreline impacted by oil) to develop a range of cost estimates representing the range in total spill cleanup costs associated with a spill incident in each specific area. Because existing Federal, State, and local standards and regulations associated with oil and chemical spill response activities offer black abalone critical habitat a high level of baseline protection, the draft economic analysis assumed that approximately 20 percent of spill cleanup costs were attributable to black abalone critical habitat. Therefore, the range of cost estimates was adjusted by an incremental score of 0.2, to generate the incremental economic impacts of the designation on oil and chemical spill response activities. This approach was based on the following assumptions: (a) The designation of black abalone critical habitat would likely restrict or modify the type of responses taken in a spill incident; (b) we are able to predict these restrictions or modifications; and (c) these restrictions or modifications would be different from what would already be required if black abalone critical habitat were not designated and thus would result in additional costs, making up 20 percent of the total spill response costs. We also stated that the existence of black abalone critical habitat could increase the number of responses by requiring a response where one was not required before.

In evaluating how to incorporate the new information provided by the NPS on small boat wrecks and associated oil spills, we considered how the designation of critical habitat for black abalone may modify the response to such incidents. We obtained additional information from NOAA regarding spill response activities that led us to re-consider how the critical habitat designation may modify the response to spill incidents. The additional information obtained led us to conclude that there is great uncertainty regarding how the designation may affect spill response activities, because of the unpredictability of incidents, the incident-specific nature of response

strategies, and the baseline protections provided by strategies already in place for other sensitive resources (including black abalone). Historical data show that past spill events often result from vessel groundings or collisions, which are difficult to predict and thus are subject to emergency consultation under section 7 of the ESA. The decision of whether to respond to a spill, as well as how to respond, varies on a case-by-case basis depending on specific factors associated with a spill (*e.g.,* the location, size, type of oil, sea state). In addition, a consultation under section 7 of the ESA can modify a Federal agency's action, but cannot compel an agency to take an action it normally would not take. The existence of black abalone critical habitat in an area may affect spill response activities by prioritizing black abalone critical habitat areas for shoreline protection (*e.g.,* by the use of mechanical recovery methods, deployment of boom, or application of dispersants to keep oil offshore) or requiring shoreline assessments and nearshore water quality monitoring during and after the spill. However, these response activities would likely already be considered or required due to the presence of black abalone and/or other sensitive resources in the area, regardless of the presence of black abalone critical habitat. Thus, the presence of black abalone critical habitat may have little effect on spill response activities. Until more information is available from future spill events and response activities, it is difficult to determine the incremental impacts of this designation on spill response activities. Recognizing these uncertainties, we revised the analysis to a qualitative discussion of the potential impacts on spill response activities. We note that working with the relevant State and Federal agencies on spill response plans may be the most effective way to address our concerns regarding the potential impacts of spill response activities on critical habitat. NMFS plans to work with the U.S. Coast Guard and California's Office of Spill Prevention and Response to incorporate information on black abalone critical habitat into spill response plans and identify strategies to protect this habitat during spill response activities.

We also re-evaluated our analysis of the economic impact to vessel grounding incidents and response activities. The draft economic analysis report had identified only one vessel grounding incident in Specific Area 8. The analysis did not provide a quantitative assessment of the economic impacts to vessel grounding incidents because information was not available regarding the extent of the impacts of the incident on black abalone habitat. Because of this, NMFS was unable to determine specifically how this threat would be alleviated for Specific Area 8. We revised the economic analysis report to include the data provided by the NPS on vessel grounding incidents at Point Reyes National Seashore (in Specific Area 2). However, the additional data did not provide information on the extent of impacts to black abalone critical habitat or on specific ways this threat could be alleviated in the future. Due to uncertainty regarding the extent of impacts and how the activity may be modified to protect black abalone critical habitat, NMFS was still unable to present a quantitative assessment for the potential economic impacts to vessel grounding and response activities.

ESA 4(b)(2) Analysis: Exclusions Based on Economic Impacts

Comment 26: One commenter stated that the economic impacts to the proposed South Orange Coastal Desalination Project in specific area 12 (from Corona Del Mar State Beach to Dana Point in Orange County, California) were overestimated and do not support excluding this specific area. The commenter recommended that the estimated economic costs to the proposed desalination plant for treating hypersaline effluent or for finding an alternate method of brine disposal should not be attributed to the black abalone critical habitat designation, but should be considered baseline costs associated with the listing of the species. The commenter also stated that the estimated costs for an alternate means of brine disposal (*i.e.,* injection wells) should not be applied to the proposed desalination plant because the proposed desalination plant plans to combine the residual brine from desalination with treated wastewater to be discharged 1.5 miles offshore through an existing outfall. The commenter stated that there is no indication that the proposed desalination plant would require injection wells to avoid adversely affecting black abalone critical habitat, because the proposed method of brine disposal would minimize or avoid harm to black abalone critical habitat. The commenter recommended that the estimated economic impacts to the proposed desalination plant in specific area 12 be revised to reflect this new information and that specific area 12 should be designated because it historically supported black abalone and one individual was found there as recently as January 2010.

Response: We agree with the commenter that because the construction and operation of desalination projects require Federal permits, the Federal agency or agencies involved would need to comply with section 7 of the ESA to insure that their actions do not jeopardize the continued existence of black abalone, regardless of the critical habitat designation. If black abalone critical habitat were designated within the action area, however, the Federal agency or agencies would also need to insure that their actions do not result in the destruction or adverse modification of that critical habitat. Thus, some of the costs of treating or disposing of residual brine would be attributed to the listing and would be considered baseline costs, but some of the costs may also be attributed to the critical habitat designation. The economic analysis attempts to estimate the incremental costs of the critical habitat designation by applying an incremental score to the total estimated costs. The incremental score represents the estimated proportion of the costs that can be attributed to the critical habitat designation.

In the draft Economic Analysis Report (NMFS 2010b), we considered a range of costs to desalination plants from low (*i.e.,* minimal or zero costs if the desalination plant is co-located with a power plant in order to mix the residual brine with the power plant's wastewater prior to discharge) to high (*i.e.,* costs to use an alternate method of brine disposal, such as injection wells). The proposed method for brine disposal at the South Orange Coastal Desalination Plant (*i.e.,* combining the residual brine with treated wastewater, to be discharged through an existing outfall at 1.5 miles offshore) is similar to the example provided in the draft Economic Analysis of desalination plants being co-located with power plants. We do not know at this time what the potential effects of the proposed brine disposal method would be on black abalone critical habitat and cannot state with certainty what the potential requirement might be to avoid those effects. However, we agree with the commenter that any modifications required to avoid adversely affecting black abalone critical habitat would likely be less costly than the cost of using injection wells. Thus, the economic costs to the proposed desalination project as a result of the critical habitat designation would likely be at the low end of the range of potential costs (essentially zero, because the low cost estimate could not be quantified). The final economic analysis has been revised to reflect these

changes. Based on this change, the mid-annualized economic impact estimate for specific area 12 was reduced from $1,564,400 (low estimate: $11,500; high estimate: $3,117,300) to $104,400 (low estimate: $11,500; high estimate: $197,300). Despite this reduction in the estimated economic impacts, specific area 12 was still eligible for exclusion based on our decision rule for low conservation value areas (*i.e.,* areas with a low conservation value are eligible for exclusion if the mid-annualized economic impact exceeds $100,000). We did not receive any additional information to support increasing the conservation value rating for this area, or to show that exclusion of this area would significantly impede conservation of black abalone or lead to the extinction of the species. Therefore, we determined that the economic benefits of exclusion outweigh the conservation benefits of designation for specific area 12 and exclude this area from the final designation (for more details, see the section titled ''Benefits of Exclusion and Final Exclusions Based on Economic Impacts'' as well as the final ESA 4(b)(2) Report (NMFS 2011c)).

In addition, after further review of the identified desalination plants for all of the specific areas, we found that a majority of the facilities also plan to mix the residual brine with water from wells or wastewater prior to discharge. Based on this information, we determined that the high cost estimate for the use of injection wells was no longer applicable. Therefore, the analysis of economic impacts to desalination plants was revised to remove the high cost estimate. In the final Economic Analysis Report, the economic impacts to desalination plants are discussed qualitatively, because the low cost estimate could not be quantified.

General Comments

Comment 27: One commenter stated that the proposed rule was incomplete because the list of references and certain references that were stated as available on the Web site (*e.g.,* the supporting documents) were not posted on the Web site. The commenter recommended that all references be made available on the Web site and that web addresses take users directly to the documents cited and not to the NMFS regional Web site. The commenter also requested that the public comment period be extended once the complete list of references is posted, to allow time for review and comment on the entire proposed rule.

Response: The supporting documents cited in the proposed rule were posted and available on the NMFS Southwest Region Web site (*http://swr.nmfs.noaa.gov*) as well as on the Federal eRulemaking Portal Web site (*http://www.regulations.gov*) during the public comment period. The commenter was correct, however, that the list of references was not made available on the Web site during the public comment period. We have since posted the list of references on the NMFS Southwest Region Web site. In response to the commenter's request, we have provided a Web site link in this final rule that takes users directly to the final rule and supporting documents, and have provided more detailed instructions on how to find the final rule and supporting documents on the Federal eRulemaking Portal Web site (see **ADDRESSES** section of this final rule). Although we recognize the commenter's concern regarding the unavailability of the list of references, we did not extend the public comment period due to the need to publish the final rule by the court-approved deadline of October 18, 2011. However, we informed the commenter when the list of references had been posted, and the commenter indicated that they did not have any additional comments on the proposed rule.

Comment 28: One commenter recommended that NMFS undertake a stronger education and outreach approach to publicize the critical habitat designation effort, so that State, Federal, and local municipalities, as well as affected stakeholders, can better understand the requirements for protecting black abalone and its habitat. The commenter suggested that conducting a workshop to explain the critical habitat designation would meet this goal.

Response: We typically do not share specific information about a rule prior to publication of a proposed or final rule, because decisions may change as the agency undergoes deliberations, and sharing information with the public during this deliberative process may create confusion as to the agency's official proposal and decision. However, once a proposed or final rule is published, we publicize the rule widely to ensure that all potentially affected entities and interested members of the public are aware of the proposed or final decisions. NMFS typically publicizes proposed and final rules through press releases, the **Federal Register**, and posting of the rules and supporting documents on the Southwest Region Web site and the Federal eRulemaking Portal Web site. NMFS also holds public hearings when one is requested by the appropriate date during the public comment period (no requests for a public hearing were made for the proposed black abalone critical habitat rule). We would appreciate recommendations for more effectively publicizing the critical habitat designation and helping potentially affected entities understand what the designation means and the requirements for protecting black abalone and its habitat.

Comment 29: In one of the form letters submitted by a supporter of CBD, one commenter stated that there are many species of plants and animals that deserve to be placed on the ESA list, but have been put off. The commenter stated that these creatures need protection before they go extinct.

Response: It is not clear whether the commenter was referring to species that were petitioned for ESA listing but not placed on the ESA list, or whether the commenter was referring in general to all species that may or may not have been considered for ESA listing. It is also not clear whether the commenter was referring to species solely under the jurisdiction of NMFS or to all species in general. Critical habitat designations are for species that are already listed under the ESA and, therefore, this comment is not relevant to the designation of critical habitat for black abalone. However, we note that both the NMFS and USFWS (the Services) follow an established process under section 4 of the ESA for evaluating species for listing. This process is based on the best available scientific and commercial data.

Comment 30: Several commenters provided anecdotal accounts of black abalone presence and abundance in Southern California and the offshore islands. In general, the commenters noted that black abalone were once abundant along the rocky shores of California and the offshore islands, including Catalina Island, and supported recreational and commercial harvest, but that their populations have declined to near extirpation in many areas due to factors including overharvest, illegal harvest, and disease. The commenters voiced support for the critical habitat designation to protect areas for the recovery of black abalone.

Response: The anecdotal information provided by the commenters is consistent with trends observed through long-term monitoring studies of declining black abalone populations throughout the coast and offshore islands of Southern California.

Comment 31: Several commenters expressed concerns regarding overfishing and illegal harvest and the damaging effects of these activities on abalone species as well as coastal areas. One commenter stated that since the 1950s and 1960s, we have lost almost all

abalone due to overexploitation, whether legal or illegal, and ''critical habitat designation and severe enforcement of penalties is becoming necessary to preserve or restore such once-common species as these.'' One commenter noted that abalone are constantly being over-harvested illegally along the coast of Northern California. Another commenter stated that all harvest of black abalone should be banned until the numbers have recovered substantially.

Response: The Status Review Team (SRT) for black abalone identified poaching as a continuing threat (VanBlaricom *et al.* 2009). However, the relative impact of poaching-related mortality to black abalone is poorly understood. The California Department of Fish and Game (CDFG) has documented several black abalone poaching cases from 1993 to 2003 involving removal of tens to hundreds of black abalone across all size categories (unpublished data by Ian Taniguchi, CDFG, cited in VanBlaricom *et al.* 2009). CDFG wardens estimate that 80 percent of seized abalone were returned alive to the wild. Although this critical habitat designation would not directly address the threat of poaching, it can help CDFG wardens and other enforcement officials focus their monitoring efforts on areas important to black abalone.

The SRT also identified historical overfishing as a threat that has contributed to the decline in black abalone populations (VanBlaricom *et al.* 2009). This critical habitat designation would not directly address overfishing. Overfishing of abalone has been addressed by CDFG regulations prohibiting abalone harvest south of San Francisco Bay. Section 9 of the ESA also prohibits the take of black abalone throughout its range, thus prohibiting any harvest of black abalone and adding additional penalties to those already being enforced by the state for illegal harvest of black abalone.

Comment 32: One commenter requested that the recovery plan for black abalone address the threats of climate change as it is associated with withering syndrome and ocean acidification.

Response: NMFS plans to initiate recovery planning for black abalone following publication of this final critical habitat designation. Throughout the recovery planning process, NMFS will assess the threats to black abalone and develop a recovery strategy, with input from stakeholders and the general public. NMFS will likely consider the threats from climate change during the recovery planning process.

Comment 33: Two commenters stated they would like to see black abalone recover to the extent that they could be harvested for consumption again. One of the commenters recommended that upon recovery of black abalone populations, a recreational fishery may be operated at a level to maintain the population by imposing a slot limit to allow harvest of medium-sized abalone, thereby protecting young and older abalone. The commenter stated that black abalone are capable of rapidly repopulating an area if sufficient critical habitat is established and the abalone and their habitat are properly protected.

Response: Harvest of black abalone is prohibited as long as the species is listed as endangered under the ESA. Recovery plans require that certain criteria (*i.e.,* demographic, threats-based, and long-term monitoring criteria) be met in order to down-list or de-list an ESA protected species. These criteria have not yet been established for black abalone, but will be developed in the near future. Upon recovery and delisting of the species, re-establishment of a fishery for black abalone could be considered under the appropriate state and Federal processes. The black abalone SRT stated that the natural recovery of severely-reduced black abalone populations would likely be a slow process due to the low reproductive efficiency of widely dispersed adult populations and short larval dispersal distances (VanBlaricom *et al.* 2009). However, the designation of critical habitat has been found to benefit the status and recovery of ESA-listed species (Harvey *et al.* 2002; Lundquist *et al.* 2002; Taylor *et al.* 2005; Hagen and Hodges 2006).

Comment 34: Numerous commenters submitted form letters in support of the designation of critical habitat for black abalone, specifically to protect black abalone from climate change. The commenters emphasized the importance of curbing climate change and ocean acidification in order to protect critical habitat, because global warming is exacerbating the outbreak and spread of withering syndrome and ocean acidification is threatening abalone growth and reproduction as well as the abundance of juvenile settlement habitat (*i.e.,* coralline algae). Three of the commenters stated that the threats of global warming and climate change should be high items on our national priorities list because of the broad effects on listed species and other aspects of the marine, aquatic, terrestrial, and human environment. One commenter specifically identified the need to control carbon emissions. However, another commenter stated that many members of the public may be concerned about the conservation of abalone and other life forms, but do not subscribe to the global warming hypothesis. Another commenter stated that the actions of people that contribute to destruction of habitat, such as activities that dump poisons in the environment, must be modified.

Response: We recognize the commenters' concerns regarding activities that affect black abalone and its habitat as well as other aspects of the natural and human environment. Once this final critical habitat designation takes effect, section 7 of the ESA requires that Federal agencies insure that their actions are not likely to result in the destruction or adverse modification of black abalone critical habitat. The CHRT identified several categories of activities that may affect the biological and physical habitat features essential for the conservation of black abalone, including NPDES-permitted activities and activities that lead to global climate change. Thus, the protections afforded to black abalone critical habitat under section 7 of the ESA may result in changes to these activities to avoid the destruction or adverse modification of critical habitat. However, the requirements under section 7 of the ESA apply only to actions that have a Federal nexus (*i.e.,* actions funded, permitted, or carried out by a Federal agency or agencies) and may not apply to all actions related to global climate change and habitat destruction. For activities leading to global climate change, it is uncertain at this time how the black abalone critical habitat designation may affect these activities or if a Federal nexus exists for these activities.

Comment 35: One commenter stated that the Minerals Management Service (MMS) has been renamed the Bureau of Ocean Energy Management, Regulation, and Enforcement (BOEMRE) and requested that the final rule and all supporting documents be revised to refer to the current agency name.

Response: We have revised the final rule and supporting documents to refer to BOEMRE instead of the MMS, explaining that BOEMRE was formerly MMS.

Methods and Criteria Used To Identify Critical Habitat

In accordance with section 4(b)(2) of the ESA and our implementing regulations (50 CFR 424.12(a)), this final rule is based on the best scientific and commercial information available concerning the present and historical range, habitat, biology, and threats to habitat for black abalone. In preparing

this rule, we reviewed and summarized current information on black abalone, including recent biological surveys and reports, peer-reviewed literature, the NMFS status review for black abalone (VanBlaricom *et al.,* 2009), and the proposed and final listing rules for black abalone (71 FR 1986, January 11, 2008; 74 FR 1937, January 14, 2009). To assist with the evaluation of critical habitat, we convened a black abalone CHRT, comprised of seven Federal biologists from NMFS, the National Park Service (NPS), US Geological Survey (USGS), the Bureau of Ocean Energy Management, Regulation, and Enforcement (BOEMRE; formerly, Minerals Management Service or MMS), and the Monterey Bay NMS, all with experience in abalone research, monitoring, and management. The CHRT used the best available scientific and commercial data and their best professional judgment to: (1) Verify the geographical area occupied by black abalone at the time of listing; (2) identify the physical and biological features essential to the conservation of the species; (3) identify specific areas within the occupied area containing those essential physical and biological features; (4) verify whether the essential features within each specific area may need special management considerations or protection and identify activities that may affect these essential features; (5) evaluate the conservation value of each specific area; and (6) determine if any unoccupied areas are essential to the conservation of black abalone. Following the close of the public comment period, the CHRT convened to review all of the relevant public comments received, again using the best available information to consider the information and recommendations provided in the comments. The CHRT's evaluation and conclusions are described in detail in the following sections, as well as in the final Biological Report (NMFS 2011a).

Physical or Biological Features Essential for Conservation

Joint NMFS–USFWS regulations, at 50 CFR 424.12(b), state that in determining what areas are critical habitat, the agencies ''shall consider those physical and biological features that are essential to the conservation of a given species and that may require special management considerations or protection.'' Features to consider may include, but are not limited to: ''(1) Space for individual and population growth, and for normal behavior; (2) Food, water, air, light, minerals, or other nutritional or physiological requirements; (3) Cover or shelter; (4) Sites for breeding, reproduction, rearing of offspring, germination, or seed dispersal; and generally; (5) Habitats that are protected from disturbance or are representative of the historic geographical and ecological distributions of a species.'' The regulations also require the agencies to ''focus on the principal biological or physical constituent elements'' (hereafter referred to as ''Primary Constituent Elements'' or PCEs) within the specific areas considered for designation that are essential to conservation of the species, which ''may include, but are not limited to, the following: * * * spawning sites, feeding sites, seasonal wetland or dryland, water quality or quantity, * * * geological formation, vegetation type, tide, and specific soil types.''

Based on the best available scientific information, the CHRT identified the following PCEs essential for the conservation of black abalone:

(1) *Rocky substrate.* Suitable rocky substrate includes rocky benches formed from consolidated rock of various geological origins (*e.g.,* igneous, metamorphic, and sedimentary) that contain channels with macro- and micro- crevices or large boulders (greater than or equal to 1 m in diameter) and occur from MHHW to a depth of −6 m relative to MLLW. All types of relief (high, medium and low; 0.5 to greater than 2 m vertical relief; Wentworth 1922) support black abalone and complex configurations of rock surfaces likely afford protection from predators, direct impacts of breaking waves, wave-born projectiles, and excessive solar heating during daytime low tides. Black abalone typically occupy the middle intertidal zones, although in some areas black abalone may predominately occupy the high or low intertidal zones. Local variation exists, depending on conditions such as the level of exposure and where drift kelp (an important food resource for black abalone) may be accumulating at particular locations. Leighton (1959) found evidence for ontogenetic shifts in depth distribution among juvenile abalone on the Palos Verdes Peninsula. Juvenile black abalone (10–30 mm) were found at mid-intertidal depths on undersides of rock providing clear beneath-rock open space while juveniles in the 5–10 mm size range were found at higher intertidal zones in narrow crevices and in depressions abraded into rock surfaces by the intertidal chiton, *Nutallina californica* (Reeve 1847). Black abalone observed at greater depths (3–6 m) typically were mature adults. California contains approximately 848.5 miles (1365.5 km) of consolidated rocky coastline, and 548.5 miles (882.8 km) or 65 percent of it falls within the areas considered in this critical habitat designation.

(2) *Food resources.* Abundant food resources including bacterial and diatom films, crustose coralline algae, and a source of detrital macroalgae, are required for growth and survival of all stages of black abalone. From post-larval metamorphosis to a size of about 20 mm, black abalone consume microbial and possibly diatom films (Leighton 1959; Leighton and Boolootian 1963; Bergen 1971) and crustose coralline algae. At roughly 20 mm black abalone begin feeding on both attached macrophytes and pieces of drift plants cast into the intertidal zone by waves and currents. The primary macroalgae consumed by juvenile and adult black abalone are giant kelp (*Macrocystis pyrifera)* and feather boa kelp (*Egregia menziesii)* in southern California (i.e., south of Point Conception) habitats, and bull kelp (*Nereocystis leutkeana)* in central and northern California habitats (i.e., north of Santa Cruz), although *Macrocystis* and *Egregia* may be more prominent than *Nereocystis* in central California habitats between Point Conception and Santa Cruz (public comment submitted by MARINe). Southern sea palm (*Eisenia arborea),* elk kelp (*Pelagophycus porra),* stalked kelp (*Pterygophora californica),* and other brown kelps (*Laminaria sp.)* may also be consumed by black abalone.

(3) *Juvenile settlement habitat.* Rocky intertidal and subtidal habitat containing crustose coralline algae and crevices or cryptic biogenic structures (*e.g.,* urchins, mussels, chiton holes, conspecifics, anemones) is important for successful larval recruitment and juvenile growth and survival of black abalone less than approximately 25 mm shell length. The presence of adult abalone may facilitate larval settlement and metamorphosis, because adults may: (1) Promote the maintenance of substantial substratum cover by crustose coralline algae by grazing other algal species that could compete with crustose coralline algae; and/or (2) outcompete encrusting sessile invertebrates (*e.g.* tube worms and tube snails) for space on rocky substrates, thereby promoting the growth of crustose coralline algae and settlement of larvae; and/or (3) emit chemical cues necessary to induce larval settlement (Miner *et al.* 2006; Toonen and Pawlick 1994). Increasing partial pressure of CO_2 may decrease calcification rates of coralline algae, thereby reducing their abundance and ultimately affecting the survival of newly settled black abalone (Feely *et al.* 2004; Hall-Spencer *et al.*

2008). Laboratory experiments have shown that the presence of pesticides (*e.g.,* dichlorodiphenyltrichloroethane (DDT), 2,4-dichlorophenoxyacetic acid (2,4-D), methoxychlor, dieldrin) interfered with larval settlement of abalone, because the chemical cues emitted by coralline algae and its associated diatom films, which trigger abalone settlement, are blocked (Morse *et al.* 1979). The pesticide oxadiazon was found to severely reduce algal growth (Silver and Riley 2001). During the public comment period on the proposed rule, we solicited the public for additional information regarding processes that mediate crustose coralline algal abundance, however, we did not receive any additional information and data are still lacking regarding what other factors may be controlling crustose coralline algal abundance.

(4) *Suitable water quality.* Suitable water quality includes temperature, salinity, pH, and other chemical characteristics necessary for normal settlement, growth, behavior, and viability of black abalone. The biogeographical water temperature range of black abalone is from 12 to 25 °C, but they are most abundant in areas where the water temperature ranges from 18 to 22 °C (Hines *et al.* 1980). There is increased mortality due to withering syndrome (WS) during periods following elevated sea surface temperature (Raimondi *et al.* 2002). The CHRT did not consider the presence of the bacteria that causes WS when evaluating the condition of this PCE because it is thought to be present throughout a large portion of the species' current range (greater than 60 percent), including all coastal specific areas as far north as San Mateo County, as well as at Bodega Head (though not found in a sample collected from Point Reyes in 2009) and the Farallon Islands (pers. comm. with Jim Moore, CDFG, on June 8, 2011). Instead the CHRT relied on sea surface temperature information to evaluate water quality in terms of disease virulence, recognizing that elevated sea surface temperatures are correlated with increased rates of WS transmission and manifestation in abalone. Elevated levels of contaminants (*e.g.,* copper, oil, polycyclic aromatic hydrocarbon (PAH) endocrine disrupters, persistent organic compounds (POC)) can cause mortality of black abalone. In 1975, toxic levels of copper in the cooling water effluent of a nuclear power plant near Diablo Canyon, California, were associated with abalone mortalities in a nearshore cove that received significant effluent flows (Shepherd and Breen 1992; Martin *et al.* 1977). As mentioned above for the *Juvenile settlement habitat* PCE, laboratory experiments have shown that the presence of some pesticides interfere with larval settlement of abalone (Morse *et al.* 1979) and can severely reduce algal growth (Silver and Riley 2001). The suitable salinity range for black abalone is from 30 to 35 parts per thousand (ppt), and the suitable pH range is 7.5–8.5. Ocean pH values that are outside of the normal range for seawater (i.e., pH less than 7.5 or greater than 8.5; *http://www.marinebio.net/marinescience/02ocean/swcomposition.htm*) may cause reduced growth and survivorship in abalone as has been observed in other marine gastropods (Shirayama and Thornton 2005). Specifically, with increasing uptake of atmospheric CO_2 by the ocean, the pH of seawater becomes more acidic, which may decrease calcification rates in marine organisms and result in negative impacts to black abalone in at least two ways: (1) By disrupting an abalone's ability to maintain and grow its protective shell; and/or (2) by reducing abundance of coralline algae (and associated diatom films and bacteria), which may mediate larval settlement through chemical cues and support and provide food sources for newly settled abalone (Feely *et al.* 2004; Hall-Spencer *et al.* 2008).

(5) *Suitable nearshore circulation patterns.* Suitable circulation patterns are those that retain eggs, sperm, fertilized eggs, and ready-to-settle larvae enough so that successful fertilization and settlement to suitable habitat can take place. Nearshore circulation patterns are controlled by a variety of factors including wind speed and direction, current speed and direction, tidal fluctuation, geomorphology of the coastline, and bathymetry of subtidal habitats adjacent to the coastline. Anthropogenic activities may also have the capacity to influence nearshore circulation patterns (*e.g.,* intake pipes, sand replenishment, dredging, in water construction, etc.). These factors, in combination with the early life history dynamics of black abalone, may influence retention or dispersal rates of eggs, sperm, fertilized eggs, and ready-to-settle larvae (Siegel *et al.* 2008). Forces that disperse larvae offshore (*i.e.,* by distances on the order of greater than tens of kilometers) may decrease the likelihood that abalone larvae will successfully settle to suitable habitats, given that: (a) Black abalone gamete and larval durations are relatively short; (b) larvae have little control over their position in the water column; and (c) ready-to-settle larvae require shallow, intertidal habitat for settlement. However, retention of larvae inshore due to bottom friction and minimal advective flows near kelp beds (the ''sticky water'' phenomenon; Wolanski and Spagnol 2000; Zeidberg and Hamner 2002) may increase the likelihood that larvae will successfully settle to suitable habitats.

Geographical Area Occupied by the Species and Specific Areas Within the Geographical Area Occupied

One of the first steps in the critical habitat designation process is to define the geographical area occupied by the species at the time of listing and to identify specific areas, within this geographically occupied area, that contain at least one PCE that may require special management considerations or protection. In the January 2009 final ESA listing rule, the range of black abalone was defined to extend from Crescent City (Del Norte County, California) to Cape San Lucas, Baja California, Mexico, including all offshore islands. The northern and southern extent of the range was determined based on museum specimens collected more than 10 years prior to the listing of the species (Geiger 2004). Because this range was based on dated records, and because we cannot designate critical habitat in areas outside of the United States (see 50 CFR 424.12(h)), the CHRT reconsidered the scope of the current (i.e., at the time of the final ESA listing) occupied range of black abalone. The CHRT examined data from ongoing monitoring studies along the California coast (Neuman *et al.* 2010) and literature references to determine that, within the United States, the geographical area currently occupied by black abalone extends from the Del Mar Landing Ecological Reserve in Sonoma County, California, to Dana Point, Orange County, California, on the mainland and includes the Farallon Islands, Año Nuevo Island, and all of the California Channel Islands. The CHRT noted that there are pockets of unoccupied habitat within this broader area of occupation (NMFS 2011a). Within this geographically occupied area, black abalone typically inhabit coastal and offshore island rocky intertidal and subtidal habitats from MHHW to depths of −6 m (relative to MLLW) (Leighton, 2005). The CHRT then identified ''specific areas'' within the geographical area occupied by the species that may be eligible for designation as critical habitat under the ESA. For an occupied specific area to be eligible for designation it must contain at least one PCE that may require special

management considerations or protection. For each occupied specific area, the CHRT reviewed the available data regarding black abalone presence and verified that each area contained one or more PCE(s) that may require special management considerations or protection. The CHRT determined that for all specific areas, unless otherwise noted, MHHW delineates the landward boundary, and the −6 m (relative to MLLW) bathymetric contour delineates the seaward boundary. The CHRT also agreed to consider naturally occurring geomorphological formations and size (i.e., area) to delineate the northern and southern boundaries of the specific areas. The CHRT intentionally aimed to delineate specific areas of similar sizes in order to minimize biases in the economic cost estimates for the specific areas.

The CHRT scored and rated the relative conservation value of each occupied specific area. Areas rated as ''High'' were deemed to have a high likelihood of promoting the conservation of the species. Areas rated as ''Medium'' or ''Low'' were deemed to have a moderate or low likelihood of promoting the conservation of the species, respectively. The CHRT considered several factors in assigning the conservation value ratings, including the PCEs present, the condition of the PCEs, and the historical, present, and potential future use of the specific area by black abalone. These factors were scored by the CHRT and summed to generate a total score for each specific area, which was considered in the CHRT's evaluation and assignment of the final conservation value ratings. The final Biological Report (NMFS 2011a; available via our Web site at *http://swr.nmfs.noaa.gov,* via the Federal eRulemaking Web site at *http://www.regulations.gov,* or upon request—see **ADDRESSES**) describes in detail the methods used by the CHRT in their assessment of the specific areas and provides the biological information supporting the CHRT's assessment as well as the final conservation value ratings and justifications. The following paragraphs provide a brief description of the presence and distribution of black abalone within each specific area, additional detail regarding the CHRT's methods for delineating the specific areas, and the justification for assigning conservation scores. The following paragraphs also provide a brief description of the activities within each specific area that may threaten the quality of the PCEs, which are discussed in more detail in the *Special Management Considerations or Protection* section below and in the final Economic Report (NMFS 2011b). Activities that exacerbate global climate change (most notably fossil fuel combustion, which contributes to an increase in atmospheric CO_2 levels and the indirect outcomes of sea level rise, sea surface temperature elevation, and ocean acidification) were identified as a concern for all of the specific areas. The Black Abalone Critical Habitat Designation maps (in the regulatory text section), as well as the final Biological Report (NMFS 2011a), show the location of each specific area considered for designation.

Specific Area 1. Specific Area 1 includes the rocky intertidal and subtidal habitats from the Del Mar Landing Ecological Reserve to Bodega Head in Sonoma County, CA. Bodega Head is a small peninsula that creates a natural barrier between it and the coastline that lies to the east and south. In addition, the geological origin of Bodega Head differs from that of the coastline to the east and south of it. For these reasons, this location was chosen to delineate the southern boundary of Specific Area 1. The CHRT scored the conservation value of this area as ''High,'' because, although the best available data indicate that black abalone are rare in this area, the area may serve as a refuge from WS and contains high quality habitat that can support large numbers of black abalone. Based on the limited historical data available for this area (Geiger 2003; State Water Resources Control Board (SWRCB)1979a; pers. comm. with J. Sones, Bodega Marine Reserve (BMR), University of California Davis, on January 7, 2010), black abalone were encountered occasionally in some locations. Black abalone have been present in this area in low numbers since the Partnership for Interdisciplinary Studies of Coastal Oceans (PISCO) and UCSC began its long-term intertidal sampling program in the early 2000s. Black abalone are currently considered to be rare (*i.e.,* difficult to find with some search effort and rarely seen at sampling sites; pers. comm. with J. Sones, BMR, on January 7, 2010). The CHRT expressed uncertainty regarding the area's ability to support early life stages of black abalone because historical and current data are lacking. However, the presence of good to excellent quality rocky substrate (*e.g.,* 87 percent of rocky substrate available is consolidated), food resources, and water quality (SWRCB 1979a) and fair to good settlement habitat led the CHRT to conclude that the area could support a larger black abalone population comprised of multiple size classes. There are several activities occurring within this area that may threaten the quality of the PCEs including waste-water discharge, agricultural pesticide application and irrigation, construction and operation of tidal and wave energy projects, and activities that exacerbate global climate change (*e.g.,* fossil fuel combustion). This area is at the limit of the species' northern range, which may explain the rarity of black abalone here. However, it is also one of the few areas along the California coast that has not yet been affected by WS and serves as a refuge from the disease. In addition, the CHRT was of the opinion that, should the population shift northward along the coast with predicted increases in sea surface temperatures, this area would provide suitable habitat to support large densities of black abalone.

Specific Area 2. Specific Area 2 includes rocky intertidal and subtidal habitats from Bodega Head in Sonoma County, CA, to Point Bonita in Marin County, CA. Point Bonita was chosen to delineate the southern boundary of this specific area because it sits at the southern point of the Marin Headlands, the final promontory encountered as one moves south along the coast before reaching the entrance to San Francisco Bay. The CHRT scored the conservation value of this area as ''High,'' because, although black abalone are considered rare in this area, the area may serve as a refuge from WS and contains high quality habitat that can support large numbers of black abalone. Historical presence of black abalone within this area is limited, but in locations where black abalone were observed, they were considered rare (Light 1941; SWRCB 1980a and 1980b; pers. comm. with S. Allen, Point Reyes National Seashore, on January 6, 2010). Since the mid-2000s, Point Reyes National Seashore and Golden Gate National Recreation Area staff have observed black abalone at several locations, but their qualitative abundance is considered to be rare (see definition of rare above). This was confirmed in 2010 through surveys conducted by PISCO, NMFS, and UCSC. This area contains good to excellent quality consolidated rocky substrate (*e.g.,* 71 percent of rocky substrate available is consolidated), food resources, and water quality, and fair to good settlement habitat. There are several activities occurring within this area that may threaten the quality of the PCEs, including: Sand replenishment, waste-water discharge, coastal development, non-native species introduction and management, activities

that exacerbate global climate change, and agricultural pesticide application and irrigation. This area is near the limit of the species' northern range, which may explain the rarity of black abalone here, but it is also one of the few areas along the California coast that has not yet been affected by WS. The CHRT was of the opinion that the area could support greater densities and multiple size classes of black abalone in the future if habitat changes (*e.g.,* sea surface temperature rise) cause black abalone populations to shift northward along the coast.

Specific Area 3. Specific Area 3 includes the rocky intertidal and subtidal habitats surrounding the Farallon Islands, San Francisco County, CA. This area is a group of islands and rocks found in the Gulf of the Farallones, 27 miles (43 km) west of the entrance to San Francisco Bay and 20 miles (32 km) south of Point Reyes. The islands are a National Wildlife Refuge and are currently managed by the USFWS, in conjunction with the Point Reyes Bird Observatory Conservation Science. The waters surrounding the islands are part of the Gulf of the Farallones NMS. The CHRT scored the conservation value of this area as ''Medium,'' because the area contains high quality habitat to support black abalone populations and has not yet been affected by WS. Historical presence of black abalone in intertidal habitats surrounding the Farallon Islands was noted in the late 1970s (SWRCB 1979c) and again in the early 1990s (E. Ueber, NPS (retired), unpublished data). Black abalone have been observed in Specific Area 3 during limited surveys conducted since 2005 (pers. comm. with Jan Roletto, Gulf of the Farallones NMS, on February 27, 2010). Researchers have confirmed that all of the PCEs are present and of good to excellent quality, and adverse impacts due to anthropogenic activities on these isolated islands are relatively low. However, the CHRT expressed concern over the following activities that may affect habitat features important for black abalone conservation and recovery, including: Waste-water discharge, agricultural pesticide application and irrigation, non-native species introduction and management, oil and chemical spills and clean-up, and activities that exacerbate global climate change.

Specific Area 4. Specific Area 4 extends from the land mass framing the southern entrance to San Francisco Bay to Moss Beach, San Mateo County, CA, and includes all rocky intertidal and subtidal habitats within this area. The CHRT scored the conservation value of this area as ''Medium,'' because, although black abalone are present in the area, the habitat is of lower quality compared to the specific areas to the north due to an abundance of sand and steep and narrow habitats that are not likely to support black abalone. There is limited historical and current information regarding black abalone occurrence and abundance along this stretch of the coast. At the one site where black abalone were noted historically, they were considered to be rare (Light 1941). PISCO and UCSC researchers found ten individuals within this specific area during limited surveys conducted since 2007. The CHRT considered the PCEs within the area to be of fair to good quality. While the CHRT was uncertain about this area's ability to support early life stages because data are lacking, it was more confident that the area can support the long-term survival of juveniles and adults based on several lines of evidence from historical records (Light 1941; pers. comm. with J. Sones, BMR, on January 7, 2010; pers. comm. with M. Miner, UCSC, on February 11–12, 2010). The CHRT noted that the following activities may threaten the quality of the PCEs within this specific area: Sand replenishment, waste-water discharge, coastal development, agricultural pesticide application and irrigation, non-native species introduction and management, oil and chemical spills and clean-up, and activities that exacerbate global climate change.

Specific Area 5. Specific Area 5 includes rocky intertidal and subtidal habitats from Moss Beach to Pescadero State Beach, San Mateo County, CA. This area was considered separately from Specific Area 4, even though each area alone is smaller in size compared to the majority of the other specific areas and both Specific Areas 4 and 5 were given a conservation value of ''Medium.'' The reasons for separate consideration were that: (1) The CHRT team viewed the PCEs in Specific Area 5 as being of lower quality overall than those contained within Specific Area 4; and (2) the level of certainty the CHRT had in evaluating the conservation value of Specific Area 4 was higher than that for Specific Area 5. The CHRT scored the conservation value of this area as ''Medium,'' recognizing that all of the PCEs were present in the area and their current quality ranged from poor to good. The CHRT also recognized that this area lies to the north of areas that have experienced population declines, and thus the habitat in this area may still provide a refuge from the devastating effects of WS. The CHRT expressed a high degree of uncertainty regarding the area's ability to support early life stages and long-term survival of juveniles and adults, however, because limited surveys have only been conducted (by Point Reyes National Seashore and Golden Gate National Recreation Area researchers as well as by PISCO, NMFS, and UCSC) in the area since the species was listed in 2009 and only one black abalone was found during these surveys. Waste-water discharge, oil and chemical spills and clean-up, and activities that exacerbate global climate change may compromise the quality of the PCEs within this specific area.

Specific Area 6. Specific Area 6 includes the rocky intertidal and subtidal habitats surrounding Año Nuevo Island, San Mateo County, CA. The island lies 50 miles (74 km) south of San Francisco Bay and, 200 years ago, it was connected to the mainland by a narrow peninsula. Today it is separated from the mainland by a channel that grows wider with each winter storm. Año Nuevo Island is managed by the UCSC Long Marine Laboratory under an agreement with the California Department of Parks and Recreation. The Año Nuevo Island Reserve, including the island and surrounding waters, comprises approximately 25 of the 4,000 acres (10 of 1,600 ha) of the Año Nuevo State Reserve, the rest of which is on the mainland opposite the island. The CHRT scored the conservation value of this area as ''High,'' because the area contains good habitat to support black abalone and, although surveys have not been conducted in this area since the mid-1990s, historical data indicate the area supported high densities of black abalone. Black abalone were common in intertidal habitats surrounding the island during surveys conducted from 1987–1995, with mean densities ranging from 6–8 per m^2 (Tissot 2007; VanBlaricom *et al.* 2009). PISCO and UCSC reestablished monitoring on Año Nuevo Island in 2010. In a limited search of one of the areas previously sampled by Tissot, approximately 50 black abalone (individuals ranged between 60–180mm in size) were found. The CHRT verified that good to excellent quality rocky substrate, food resources, and water quality, and fair to good settlement habitat exist at Año Nuevo Island, but expressed uncertainty regarding whether the area currently supports early life stages and long-term survival of juveniles and adults. The impact of global climate change on the habitat features important to black

abalone was the concern identified within this specific area.

Specific Area 7. Specific Area 7 includes the rocky intertidal and subtidal habitats from Pescadero State Beach, San Mateo County, CA, to Natural Bridges State Beach, Santa Cruz County, CA. Situated to the north of Monterey Bay, Natural Bridges State Beach marks the last stretch of rocky intertidal habitat before reaching the primarily fine-to medium-grained sand beaches of Monterey Bay (*http://www.sanctuarysimon.org/monterey/sections/beaches/b_overview_map.php*). The CHRT scored the conservation value of this area as ''High,'' because the area contains good to excellent quality habitat that historically supported and currently supports recruitment and juvenile and adult survival. Historical data are limited, but the information available suggests that black abalone were common at a couple of sites within this specific area in the late 1970s and early 1980s and rare at the majority of sites (unpublished data available online at: *http://www.sanctuarysimon.org/monterey/sections/rockyShores/project_info.php?projectID=100281&sec=rs (accessed June 7, 2011)*). PISCO and UCSC began intertidal black abalone surveys in this area in 1999 and, at that time, qualitative abundance ranged from rare to common, depending on the specific site. Sampling by PISCO, the MBNMS, Sea Grant, and UCSC within the last 6 years indicates that black abalone are present and common at about 50 percent of the sites within this area, but that abundance may be declining at a few of these sites. At the other sites, black abalone are either present, but rare, or completely absent. The CHRT confirmed that all of the PCEs are present and of good to excellent quality here. PISCO data (Raimondi *et al.* 2002; Tissot 2007) provide evidence that the area supports early life stages (i.e., small individuals (< 30mm) are present currently; see definition in NMFS 2011a) and long-term survival of juveniles and adults (i.e., there is stable or increasing abundance, and multiple size classes of black abalone evident in length-frequency distributions; see definition in NMFS 2011a). The CHRT identified the following activities that may threaten the quality of habitat features essential to black abalone within this area: Sand replenishment, waste-water discharge, coastal development, sediment disposal activities (associated with road maintenance, repair, and construction), agricultural pesticide application and irrigation, oil and chemical spills and clean-up, construction and operation of desalination plants, vessel grounding incidents and response, non-native species introduction and management, kelp harvesting, and activities that exacerbate global climate change.

Specific Area 8. Specific Area 8 includes rocky intertidal and subtidal habitats from Pacific Grove to Prewitt Creek, Monterey County, CA. Pacific Grove marks the first stretch of rocky intertidal habitat to the south of the fine-to medium-grained sand beaches of Monterey Bay (*http://www.sanctuarysimon.org/monterey/sections/beaches/b_overview_map.php*). The CHRT scored the conservation value of this area as ''High,'' because the area contains high quality habitat that has historically supported and currently supports black abalone recruitment and juvenile and adult survival. Surveys conducted prior to 2004 indicated that black abalone encompassing a range of sizes were present and common at all of the sampled sites within this area (SWRCB1979b and 1979d; Raimondi *et al.* 2002; Tissot 2007). More recent information gathered within the last 6 years by PISCO, MBNMS, Sea Grant, and UCSC indicates that black abalone encompassing a range of sizes remain at all sites sampled and are considered common at 93 percent of the sites. The CHRT confirmed that all of the PCEs are present and of good to excellent quality, but may be threatened by waste-water discharge, coastal development, agricultural pesticide application and irrigation, oil and chemical spills and clean-up, construction and operation of desalination plants, kelp harvesting, and activities that exacerbate global climate change. PISCO data (Raimondi *et al.* 2002; Tissot 2007) provide evidence that the area supports early life stages and long-term survival of juveniles and adults (see NMFS 2011a for details).

Specific Area 9. Specific Area 9 includes rocky intertidal and subtidal habitats from Prewitt Creek, Monterey County, CA, to Cayucos, San Luis Obispo County, CA. Situated on the northern edge of Estero Bay, Cayucos marks the last stretch of rocky intertidal habitat before reaching the primarily fine-to medium-grained sand beaches of Estero Bay. The CHRT scored the conservation value of this area as ''High,'' because the area contains high quality habitat that has historically supported and currently supports black abalone recruitment and juvenile and adult survival. BOEMRE, MBNMS, PISCO, Sea Grant, and UCSC established long-term monitoring sites within this area between 1995 and 2008. Surveys conducted prior to 2004 indicated that black abalone of a range of sizes were present and common at all but one of the sites surveyed within this area (Raimondi *et al.* 2002; Tissot 2007). More recent information gathered by PISCO and UCSC indicates that black abalone of a range of sizes are present at all sites within the area and are commonly found at 57 percent of the sites, occasionally found with some search effort at 14 percent of the sites, and rarely found at 29 percent of the sites. The CHRT confirmed that all of the PCEs are present and of good to excellent quality. The area supports early life stages and long-term survival of juveniles and adults (see NMFS 2011a for details). However, the CHRT also noted that PISCO researchers have reported recent population declines at 57 percent of the sites sampled within this area and in at least one site, the population decline has been severe. Activities that may threaten the habitat features important for black abalone conservation are: waste-water discharge, agricultural pesticide application and irrigation, oil and chemical spills and clean-up, construction and operation of desalination plants, kelp harvesting, and activities that exacerbate global climate change.

Specific Area 10. Specific Area 10 includes rocky intertidal and subtidal habitats from Montaña de Oro State Park in San Luis Obispo County, CA, to just south of Government Point, Santa Barbara County, CA. Montaña de Oro State Park is the first stretch of rocky intertidal habitat encountered to the south of the sandy beaches of Estero Bay, thus it was chosen to delineate the northern boundary of this specific area. The southern boundary of this area, Government Point, is where the Santa Barbara Channel meets the Pacific Ocean, the mostly north-south trending portion of coast transitions to a mostly east-west trending part of the coast, and a natural division between Southern and Central California occurs. For these reasons, it was chosen as the southern boundary of this specific area. The CHRT scored the conservation value of this area as ''High,'' because the area contains good habitat to support black abalone populations. However, declines in black abalone populations have occurred at some survey sites due to WS, resulting in changes to the habitat in the absence of black abalone. Historical data indicates that black abalone were present at 100 percent of the sites sampled within this specific area and that they were considered to be common at a majority of the sites sampled (Raimondi *et al.* 2002; Tissot 2007). BOEMRE and University of California Santa Barbara (UCSB)

established long-term monitoring sites within this area in 1991, which have been biannually monitored to the present, and are currently monitored by BOEMRE and UCSC. PISCO and BOEMRE added biodiversity sites (sites established under the Coastal Biodiversity Survey to measure diversity and abundance of algal and invertebrate communities living on the rocky intertidal; *http://cbsurveys.ucsc.edu/*) in 2001, which are currently monitored periodically by PISCO and UCSC+. Since 2005, population declines have been noted at most locations within this specific area, with local extinction occurring in at least one sampling site. Despite declines in abundance and lack of evidence of recent recruitment in this specific area, the CHRT confirmed that the PCEs range from fair to excellent quality along this stretch of the California coast. The CHRT identified several activities that may threaten the quality of the PCEs within this specific area, including: In-water construction, waste-water discharge, coastal development, agricultural pesticide application and irrigation, construction and operation of power generating and desalination plants, mineral and petroleum exploration and extraction, non-native species introduction and management, kelp harvesting and activities that exacerbate global climate change.

Specific Area 11. Specific Area 11 includes rocky intertidal and subtidal habitats surrounding the Palos Verdes Peninsula and extends from the Palos Verdes/Torrance border to Los Angeles Harbor in southwestern Los Angeles County, CA. This small peninsula is one of only two areas within Santa Monica Bay that contain intertidal and subtidal rocky substrate suitable for supporting black abalone. The limited extent of rocky intertidal habitat is what defines the northern and southern boundaries of this specific area. The CHRT scored the conservation value of this area as ''Medium.'' Currently, there is no evidence that this area supports recruitment, and, given the extremely low numbers of juveniles and adults, it is suspected that the area does not support long-term persistence of this population (Miller and Lawrenz-Miller 1993; pers. comm. with J. Kalman, Cabrillo Marine Aquarium (CMA), on February 12, 2010; pers. comm. with B. Allen, California State University Long Beach (CSULB), on February 5, 2010). However, many of the habitat features important to black abalone are still present and are in fair to excellent condition, which led to the CHRT's conclusion that this area is of ''Medium'' conservation value. Long-term intertidal monitoring on the Peninsula conducted by the CSULB and the CMA began in 1975, and, at that time, densities ranged from 2 to 7 per m^2. Densities declined throughout the 1980s, and by the 1990s black abalone were locally extinct at a majority of sampling sites within the area. Good to high quality rocky substrate and food resources and fair to good settlement habitat persist within this area. The CHRT recognized that water quality within this area is in poor condition. Unlike the majority of the other areas where significant declines in black abalone abundance have occurred recently (since the 1980s) due to WS, declines in this area occurred prior to the onset of WS and have been attributed to the combined effects of significant El Niño events and poor water quality resulting from large-volume domestic sewage discharge by Los Angeles County during the 1950s and 1960s (Leighton 1959; Cox 1962; Young 1964; Miller and Lawrenz-Miller 1993). From the mid-1970s to 1997, however, improved wastewater treatment processes resulted in an 80 percent reduction in the discharge of total suspended solids from the White Point outfall. That, along with kelp replanting efforts in the 1970s, resulted in a remarkable increase in the kelp canopy from a low of 5 acres (2 hectares) in 1974 to a peak of more than 1,100 acres (445 hectares) in 1989. More recently, erosion and sedimentation have threatened the kelp beds off the Palos Verdes Peninsula. Since 1980, an active landslide at Portuguese Bend on the Palos Verdes Peninsula has supplied more than seven times the suspended solids as the Whites Point outfall (Los Angeles County Sanitation District 1997). The activities that may threaten the habitat features important to the conservation of black abalone are sand replenishment, waste-water management, non-native species introduction and management, kelp harvesting, and activities that exacerbate global climate change.

Specific Area 12. Specific Area 12 includes rocky intertidal and subtidal habitats from Corona Del Mar State Beach to Dana Point in Orange County, CA. The limited extent of rocky intertidal habitat is what defines the northern and southern boundaries of this specific area. The CHRT scored this area of ''Low'' conservation value primarily because the quality of the PCEs is relatively low and because black abalone have not been identified at regularly monitored sampling locations since 2005. Historical information for this area indicates that black abalone were present along this stretch of coastline, and limited abundance information suggests densities of less than one per m^2 (Tissot 2007; pers. comm. with S. Murray, California State University Fullerton (CSUF), on January 8, 2010) in the late 1970s and early 1980s. Thus, there is uncertainty regarding whether these populations were viable at that time. By 1986, local extinction of black abalone at one sampling location within this specific area was reported (Tissot 2007). The CSUF began monitoring four sites within this area in 1996, and no black abalone have been observed at these locations since 2005. A putative black abalone was observed at one additional location in January, 2010. The area contains rocky substrate (88 percent of rocky substrate is consolidated) and food resources that are in fair to good condition, but settlement habitat and water quality are in poor to fair condition. Abundance of crustose coralline algae is limited in the rocky intertidal area and the extirpation of abalone from the habitat has resulted in a shift in its biogenic structure, rendering the area less suitable for settling abalone larvae. Water quality may be tainted by waste-water discharge, agricultural pesticide application and irrigation, construction and operation of desalination plants, and changes in the thermal and chemical properties of sea water through global climate change. Food resources within this area may be impacted by kelp harvesting activities.

Specific Areas 13–16. Specific Areas 13–16 include the rocky intertidal and subtidal habitats surrounding the Northern California Channel Islands: San Miguel Island (Specific Area 13), Santa Rosa Island (Specific Area 14), and Santa Cruz Island (Specific Area 15) in Santa Barbara County, CA, and Anacapa Island (Specific Area 16) in Ventura County, CA. The Northern Channel Islands lie just off California's southern coast in the Santa Barbara Channel and remain somewhat isolated from mainland anthropogenic impacts. In 1980, Congress designated these islands and approximately 100,000 acres (405 km^2) of submerged land surrounding them as a national park because of their unique natural and cultural resources. This area was augmented by the designation of the Channel Islands NMS later that year. The sanctuary boundaries stretch 6 nautical miles (11 km) offshore, including their interconnecting channels. Channel Islands National Park (CINP) began an intertidal monitoring

program on San Miguel, Santa Rosa, and Anacapa islands in the early to mid-1980s, while monitoring on Santa Cruz Island did not begin until 1994. The CHRT scored the conservation value of these areas as ''High,'' recognizing that although the black abalone populations in these areas have experienced declines due to WS and currently lack multiple size classes, the habitat remains in fair to excellent condition and there is evidence of small-scale recruitment at a few locations. Historically, black abalone were present and common at 76 percent of the sampling locations within these specific areas (SWRCB 1979f; SWRCB 1982a and 1982b; Tissot, 2007; pers. comm. with Dan Richards, NPS, on February 11–12, 2010). Severe population declines began in 1986. By the 1990s, declines in abundance of >99 percent were observed at all of the CINP sampling sites. Since 2005, abundance at most locations remains depressed; however, at a small number of sites abundance has increased and repeated recruitment events have occurred. These specific areas contain fair to excellent rocky substrate, food resources, settlement habitat and water quality, despite the fact that abundance has declined dramatically since the 1980s. Because these islands are somewhat remote, there is a limited list of activities that may threaten the PCEs in these specific areas and they include: Oil and chemical spills and clean-up on Santa Cruz Island; waste-water discharge and agricultural pesticide application on Anacapa Island and kelp harvesting and activities that exacerbate global warming.

Specific Areas 17–20. Specific Areas 17–20 include the rocky intertidal and subtidal habitats surrounding the Southern California Channel Islands: San Nicolas Island (Specific Area 17) in Ventura County, CA, Santa Barbara Island (Specific Area 18) in Santa Barbara County, CA, and Santa Catalina Island (Specific Area 19) and San Clemente Island (Specific Area 20) in Los Angeles County, CA. The Southern Channel Islands are part of the same archipelago that includes the Northern Channel Islands. San Nicolas and San Clemente islands have been owned and operated by the U.S. Navy since the early 1930s. These islands accommodate a variety of Navy training, testing, and evaluation activities, including naval surface fire support, air-to-ground ordnance delivery operations, special operations, surface weapon launch support, and radar testing. Santa Barbara Island and its surrounding waters out to six nautical miles (11km) were designated as part of the CINP and the Channel Islands NMS in 1980. Since 1972, Santa Catalina Island has been owned primarily by a nonprofit organization, the Catalina Island Conservancy, whose mission is to preserve and conserve the island.

The CHRT scored the conservation value of San Nicolas Island as ''High,'' because the area contains good to excellent habitat that supports black abalone recruitment and juvenile and adult survival, despite severe declines in black abalone populations due to WS. Since 1981, the U. S. Geological Survey (USGS) and the University of Washington (UW) have monitored multiple sites around San Nicolas Island. Black abalone were considered common at all of the sites up until approximately 1993, when mass mortalities due to WS swept through the island (VanBlaricom *et al.* 2009). Since 2005, slight increases in abundance have been observed at 33 percent of the sampled sites and moderate increases in abundance at one site. At 55 percent of the sampled sites, abundance remains low with densities less than 2 percent of their former values prior to population declines. Recent repeated recruitment events have occurred at a few sites as evidenced by the presence of small individuals (< 30 mm; G. VanBlaricom, USGS and UW, unpublished data). Thus, this specific area supports early life stages. However, the long-term survival of juveniles and adults is questionable, given that relative abundance levels remain low and evidence of multiple size classes is still lacking at the majority of sampling sites. All of the PCEs are present and are of good to excellent quality. The CHRT identified the following activities that may compromise the quality of habitat features essential to the conservation of black abalone within this specific area: In-water construction, waste-water management, coastal development, construction and operation of desalination plants, kelp harvesting, and activities that exacerbate global climate change.

The CHRT scored the conservation value of Santa Barbara Island as ''Medium,'' because, although the PCEs are of fair to excellent quality, there is a lack of evidence of recruitment both historically and currently. In addition, Santa Barbara Island has very low numbers of juvenile and adult black abalone. CINP began limited sampling at Santa Barbara Island in 1985. At that time black abalone were present on the island, and their qualitative abundance levels ranged from rare to common. Since 2005, black abalone have disappeared from one sampling site and remain present, but rare, at another. The CHRT considered the rocky substrate and settlement habitat to be of fair to good quality, food resources to be of poor to fair quality, and water quality to be good to excellent. The only activities that threaten the PCEs and that may require special management on Santa Barbara Island are those that alter the thermal and chemical properties of sea water through global climate change, most notably activities involving fossil fuel combustion.

The CHRT scored the conservation value of Catalina Island as ''High,'' despite uncertainty in the demographic history and current status of black abalone populations on the island, because the habitat is in good condition, has supported black abalone populations historically, and could support black abalone populations currently and in the future. Surveys conducted around Catalina Island in the 1960s, 1970s, and 1980s confirm that black abalone were present at a variety of locations around the island, but size distribution and abundance information are lacking. The CINP and UCSB established a long-term sampling site at Bird Rock in 1982, and a second site was added by UCSB through California Coastal Commission funding in 1995. They are currently monitored by Tatman Foundation and UCSB. Since the 1990s, black abalone have not been encountered at these sites. All of the PCEs are present and are in fair to excellent condition. There is a great deal of uncertainty regarding whether the island supports early life stages and the long-term survival of juveniles and adults because data are lacking. Several activities may compromise the generally good habitat quality surrounding Catalina Island, including in-water construction, waste-water discharge, coastal development, oil and chemical spills and clean-up, construction and operation of desalination plants and tidal and wave energy projects, kelp harvesting, and activities that exacerbate global climate change.

The CHRT scored the conservation value of San Clemente Island as ''High,'' recognizing that the habitat in this area is in good condition and likely supported high densities of black abalone historically (pre-WS). San Clemente Island was surveyed by the CDFG from 1988–1993. As late as October 1988, black abalone were present and populations were robust at a number of locations, but by 1990, population declines due to WS were underway (CDFG 1993). Densities decreased to less than one per m^2 by 1993 (CDFG 1993). The Navy initiated a San Clemente Island-wide investigation to determine the current extent of

remaining black abalone populations on the island in 2008. During 30-minute timed searches at 61 locations that each covered approximately 1500 m^2 of potential black abalone habitat, ten black abalone (all greater than 100 mm in size) were identified and all but two of the animals were solitary individuals (Tierra Data Inc. 2008). The Navy conducted additional black abalone surveys in January and March of 2011, finding an additional 17 black abalone ranging in size from 80 to 190 mm (Navy 2011). All of the PCEs are present and are in good to excellent condition, despite the fact that there is no evidence of recruitment and the island currently does not support long-term survival of adults. In order to protect these high quality PCEs and promote the conservation of black abalone, certain activities may require modification, such as in-water construction, coastal development, kelp harvesting, and activities that exacerbate global climate change.

Special Management Considerations or Protection

Joint NMFS and USFWS regulations at 50 CFR 424.02(j) define ''special management considerations or protection'' to mean ''any methods or procedures useful in protecting physical and biological features of the environment for the conservation of listed species.'' The CHRT identified several threats to black abalone PCEs and the areas in which those threats occur. NMFS and the CHRT then determined whether at least one PCE in each specific area may require special management considerations or protection because of a threat or threats. NMFS and the CHRT worked together to identify activities that could be linked to threats, and when possible, identified ways in which activities might be altered in order to protect the quality of the PCEs. These activities are described briefly in the following paragraphs and Table 1. These activities are documented more fully in the final Biological Report (NMFS 2011a) and final Economic Analysis Report (NMFS 2011b), which provide a description of the potential effects of each category of activities on the PCEs.

The major categories of activities that may affect black abalone habitat include: (1) Coastal development (*e.g.,* construction or expansion of stormwater outfalls, residential and commercial construction); (2) in-water construction (*e.g.,* coastal armoring, pier construction, jetty or harbor construction, pile driving); (3) sand replenishment or beach nourishment activities; (4) dredging and disposal of dredged material; (5) agricultural activities (*e.g.,* irrigation, livestock farming, pesticide application); (6) NPDES activities and activities generating non-point source pollution; (7) sediment disposal activities associated with road maintenance, repair, and construction (previously called ''sidecasting''); (8) oil and chemical spills and clean-up activities; (9) mineral and petroleum exploration or extraction activities; (10) power generation operations involving water withdrawal from and discharge to marine coastal waters; (11) construction and operation of alternative energy hydrokinetic projects (tidal or wave energy projects); (12) construction and operation of desalination plants; (13) construction and operation of liquefied natural gas (LNG) projects; (14) vessel grounding incidents and response; (15) non-native species introduction and management (from commercial shipping and aquaculture); (16) kelp harvesting activities; and (17) activities that exacerbate global climate change (*e.g.,* fossil fuel combustion).

The final Biological Report (NMFS 2011a) and final Economic Analysis Report (NMFS 2011b) provide a description of the potential effects of each category of activities and threats on the PCEs. For example, activities such as in-water construction, coastal development, dredging and disposal, sediment disposal (''sidecasting''), mineral and petroleum exploration and extraction, and sand replenishment may result in increased sedimentation, erosion, turbidity, or scouring in rocky intertidal and subtidal habitats and may have adverse impacts on rocky substrate, settlement habitat, food resources, water quality, or nearshore circulation patterns. The construction of proposed energy and desalination projects along the coast would result in increased in-water construction and coastal development. The operation of these energy projects and desalination projects may also increase local water temperatures with the discharge of heated effluent, introduce elevated levels of certain metals or contaminants into the water, or alter nearshore water circulation patterns. The discharge of contaminants from activities such as NPDES activities may affect water quality, food resources (by affecting the algal community), and settlement habitat (by affecting the ability of larvae to settle). Introduction of non-native species may also affect food resources and settlement habitat if these species alter the natural algal communities. Shifts in water temperatures and sea level related to global climate change may also affect black abalone habitat. For example, coastal water temperatures may increase to levels above the optimal range for black abalone, and sea level rise may alter the distribution of rocky intertidal habitats along the California coast.

TABLE 1—SUMMARY OF ACTIVITIES THAT MAY AFFECT BLACK ABALONE PCES, INCLUDING: THE AREA(S) IN WHICH THE ACTIVITY IS LOCATED, THE PCE(S) THE ACTIVITY COULD AFFECT AND THE NATURE OF THAT THREAT, THE ESA SECTION 7 NEXUS FOR THAT ACTIVITY, AND THE POSSIBLE MODIFICATIONS TO THE ACTIVITY DUE TO THE BLACK ABALONE CRITICAL HABITAT DESIGNATION

Activity	Specific areas	PCE and nature of the threat	Section 7 nexus	Possible modification(s) to the activity
Dredging and disposal of dredged material.	Unknown ...	*Rocky substrate* PCE—Dredging that does occur near rocky intertidal and subtidal areas may increase sedimentation into the rocky habitat. A variety of harmful substances, including heavy metals, oil, tributyltin (TBT), polychlorinated biphenyls (PCBs) and pesticides, can be absorbed into the seabed sediments and contaminate them.	The U.S. Army Corps of Engineers (USACE) issues permits pursuant to Section 404 of the Clean Water Act (CWA), among several others.	Restrictions on the spatial and temporal extent of dredging activities and the deposition of dredge spoil. Requirements to monitor the effects of dredge spoil deposition on black abalone habitat.

TABLE 1—SUMMARY OF ACTIVITIES THAT MAY AFFECT BLACK ABALONE PCES, INCLUDING: THE AREA(S) IN WHICH THE ACTIVITY IS LOCATED, THE PCE(S) THE ACTIVITY COULD AFFECT AND THE NATURE OF THAT THREAT, THE ESA SECTION 7 NEXUS FOR THAT ACTIVITY, AND THE POSSIBLE MODIFICATIONS TO THE ACTIVITY DUE TO THE BLACK ABALONE CRITICAL HABITAT DESIGNATION—Continued

Activity	Specific areas	PCE and nature of the threat	Section 7 nexus	Possible modification(s) to the activity
		Water quality PCE—Dredging and disposal processes can release contaminants into the water column, affecting water quality, and making them available to be taken up by animals and plants, which could cause morphological or reproductive disorders.		
In-water construction.	10, 17, 19, and 20.	*Rocky substrate* PCE—Increased sedimentation, a side effect of some in-water construction projects, can reduce the quality and/or quantity of rocky substrate.	The USACE issues permits pursuant to Section 10 of the Rivers and Harbors Act of 1899 (RHA) among several others. Although in-water construction projects are commonly undertaken by private or non-Federal parties, in most cases they must obtain a USACE permit.	Bank stabilization measures and more natural erosion control.
		Food resources PCE—The presence of in-water structures may affect black abalone habitat by affecting the distribution and abundance of algal species that provide food for abalone or the distribution and abundance of other intertidal invertebrate species.		
		Settlement habitat PCE—Changes in algal communities could affect settlement of larval abalone (believed to be influenced by the presence of coralline algae).		
		Nearshore circulation pattern PCE—Nearshore circulation patterns may affect intertidal communities by providing stepping-stones between populations, resulting in range extensions for species with limited dispersal distances. Artificial structures, like breakwaters, may also alter the physical environment by reducing wave action and modifying nearshore circulation and sediment transport..		
Sand replenishment.	2, 4, 7, and 11.	*Rocky substrate* PCE—Sand movements could cover up rocky substrate thereby reducing its quality and/or quantity.	The USACE is responsible for administering Section 404 permits under the CWA, which are required for sand replenishment activities.	Monitor the water quality (turbidity) during and after the project. Place a buffer around pertinent areas within critical habitat that sand replenishment projects have to work around. Ensure any dredge discharge pipelines are sited to avoid rocky intertidal habitat. Construct training dikes to help retain the sand at the receiving location, which should minimize movement of sand into the rocky intertidal areas.

TABLE 1—SUMMARY OF ACTIVITIES THAT MAY AFFECT BLACK ABALONE PCEs, INCLUDING: THE AREA(S) IN WHICH THE ACTIVITY IS LOCATED, THE PCE(S) THE ACTIVITY COULD AFFECT AND THE NATURE OF THAT THREAT, THE ESA SECTION 7 NEXUS FOR THAT ACTIVITY, AND THE POSSIBLE MODIFICATIONS TO THE ACTIVITY DUE TO THE BLACK ABALONE CRITICAL HABITAT DESIGNATION—Continued

Activity	Specific areas	PCE and nature of the threat	Section 7 nexus	Possible modification(s) to the activity
NPDES-permitted activities..	1, 2, 3, 4, 5, 7, 8, 9, 10, 11, 12, 16, 17, and 19..	*Food resources* PCE—Sewage outfalls may affect food resources by causing light levels to be reduced to levels too low to support *Macrocystis* germination and growth. Eutrophication occurs around southern California sewage outfalls where phytoplankton crops and primary production exceed typical levels and approach values characteristic of upwelling periods. Discharge that results in reduced ocean pH could reduce the abundance of coralline algae. *Water quality* PCE—Exposure to heavy metals can affect growth of marine organisms, either promoting or inhibiting growth depending on the combination and concentrations of metals. There is little information on these effects on black abalone, however. Discharge that results in ocean pH values outside the normal range for seawater (e.g., typically ranging from 7.5 to 8.5) may cause reduced growth and survival of abalone, as has been observed in other marine gastropods (Shirayama and Thornton 2005).	Issuance of CWA permits. State water quality standards are subject to an ESA section 7 consultation between NMFS and the EPA and NMFS can review individual NPDES permit applications for impacts on ESA-listed species.	Where Federal permits are necessary, ensure discharge meets standards relevant for black abalone. Require measures to prevent or respond to a catastrophic event (i.e., using best technology to avoid unnecessary discharges).
Coastal development.	2, 4, 7, 8, 10, 17, 19, and 20.	*Rocky substrate* PCE—Increased sediment load that may result from urbanization of the coast and of watersheds (increased transport of fine sediments into the coastal zone by rivers or runoff) can reduce the quality and/or quantity of rocky substrate. In addition, construction of coastal armoring is often associated with coastal urban development to protect structures from wave action or prevent erosion. *Food resources* PCE—Increased sedimentation may also affect feeding by covering up food resources, altering algal communities (including algal communities on the rocky reef and the growth of kelp forests that supply drift algae), and altering invertebrate communities (affecting biological interactions). Ephemeral and turf-forming algae were found to be favored in rocky intertidal areas that experience intermittent inundation (Airoldi 1998, cited in Thompson *et al.* 2002). *Settlement habitat* PCE—Increased sedimentation may affect settlement of larvae and propagules by covering up settlement habitat as well as affecting the growth of encrusting coralline algae (Steneck *et al.* 1997, cited in Airoldi 2003), thought to be important for settlement.	The USACE permits construction or expansion of stormwater outfalls, discharge or fill of wetlands, flood control projects, bank stabilization, and in-stream work.	Stormwater pollution prevention plan; permanent stormwater site plan; and stormwater best management practice operations and maintenance.

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Activity	Specific areas	PCE and nature of the threat	Section 7 nexus	Possible modification(s) to the activity
Sediment disposal associated with road maintenance, repair, and construction (“Sidecasting”).	7 and 8	*Rocky substrate and settlement habitat* PCEs— Increased likelihood of sediment input into rocky intertidal and subtidal habitats may reduce its quality and quantity. *Food resources* PCE—May result in possible reductions or changes to food resources. See sedimentation effects as described under “Coastal development”, above.	National Marine Sanctuary (NMS) regulations prohibit discharge of materials within its boundaries, as well as outside its boundaries if the material may enter the sanctuary and harm sanctuary resources. However, under certain circumstances, a permit may be obtained from the MBNMS to allow for a prohibited activity.	Haul away (or store locally) excess material from road maintenance activities; place excess material at a stable site at a safe distance from rocky intertidal habitats; and use mulch or vegetation to stabilize the material.
Agricultural activities (including pesticide application, irrigation, and livestock farming).	1, 2, 3, 4, 7, 8, 9, 10, 12, and 16.	*Rocky substrate* PCE—Soil erosion from intensive irrigated agriculture or livestock farming of areas adjacent to the coast can cause increased sedimentation thereby reducing the quality and quantity of rocky substrate.	*Irrigation*—water suppliers may provide water via contract with U.S. Bureau of Reclamation (USBR) or using infrastructure owned or maintained by the USBR. Privately owned diversions may require a Federal permit from USACE under sections 401 or 404 of the CWA.	For irrigated agriculture: conservation crop rotation, underground outlets, land smoothing, structures for water control, subsurface drains, field ditches, mains or laterals, and toxic salt reduction.
		Food resources PCE—Herbicides are designed to kill plants, thus herbicide contamination of water could have devastating effects on aquatic plants.	*Pesticide Application*—Environmental Protection Agency (EPA) consultation on the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA), pesticide registration program, and NPDES permits for aquatic pesticides.	For pesticides application: restrictions on application of some pesticides within certain distances from streams.
		Settlement habitat PCE—Laboratory experiments showed that the presence of pesticides (those examined in the study were DDT, methoxychlor, dieldrin, and 2,4–D) interfered with larval settlement. Presence of pesticides had a much lesser effect on survival of larvae. *Water quality* PCE—Pesticides alter the chemical properties of sea water such that they can interfere with settlement cues emitted by coralline algae and associated diatom films, and/or they may inhibit growth of marine algae upon which black abalone depend for food. There is little information on these effects on black abalone or related species, however, especially for pesticides that are currently in use.	*Livestock farming*—Bureau of Land Management (BLM) and the U.S. Forest Service (USFS).	For livestock farming: fencing riparian areas; placing salt or mineral supplements to draw cattle away from rivers; total rest of allotments when possible; and frequent monitoring.

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Activity	Specific areas	PCE and nature of the threat	Section 7 nexus	Possible modification(s) to the activity
Oil & chemical spills & response.	2, 4, 5, 7, 8, 9, 12, 15, and 19.	*Rocky substrate and settlement habitat* PCEs—Oil spill clean-up activities may be as destructive, or more destructive, than the oil spill itself. Oil spill clean-up may involve application of toxic dispersants and the use of physical cleaning methods such as the use of high pressure and/or high temperature water to flush out oil which may decrease the quality of rocky substrate and settlement habitat in an area. Oil, oil/dispersant mixtures, and dispersants used in oil spill clean-up may adversely affect grazing mollusks like abalone in rocky intertidal areas, although less-toxic dispersants have been developed in recent years. *Food resources* PCE—The use of dispersants and physical cleaning methods may affect black abalone food resources (algal community). Chemical spills could also affect food resources, if the chemicals kill algae or affect algal growth. *Water quality* PCE—Effects of oil spills vary from no discernable differences to widespread mortality of marine invertebrates over a large area and reduced densities persisting a year after the spill.	Review of oil spill response plan from United States Coast Guard (USCG). Regulations under the Water Pollution Control Act.	Modifications are uncertain, but could include measures to prevent or minimize the spill from coming onshore (e.g., deploy boom, apply dispersants, mechanical recovery of spilled substance) and monitoring of the shoreline and water quality during and after the spill. These measures may already be considered due to the presence of other sensitive resources.
Vessel grounding incidents and response.	2 and 8	*Rocky substrate and settlement habitat* PCEs—Vessel grounding can affect the rocky substrate and have substantial effects on the environment, ranging from minor displacement of sediment to catastrophic damage to reefs. Wave activity may also cause the vessel to roll excessively and do more damage to the ocean floor. *Food resources* and *water quality* PCEs—The risk of invasion by foreign species attached to the ship's hull into a local environment. The wreck of an ocean-going vessel can result in large masses of steel distributed over substantial areas of seabed, particularly in high energy, shallow water environments. The wreckage may be a chronic source of dissolved iron. Elevated levels of iron may affect water quality and result in an increase of opportunistic algae blooms.	The USCG has the authority to respond to all oil and hazardous substance spills in the offshore/coastal zone, while the EPA has the authority to respond in the inland zone.	Best management practices (BMP) for oil spill and debris clean-up to reduce trampling. Education of USCG, NMS biologists, and others involved in clean-up to raise awareness of black abalone.
Construction and operation of power plants.	10	*Water quality* PCE—The power plants' use of coastal waters for cooling and subsequently discharging of heated water back into the marine environment may raise water temperatures and introduce contaminants into the water. Elevated water temperatures have been linked to increased virulence of WS.	The Diablo Canyon Nuclear Power Plant (the only power plant identified within the specific areas; located in specific area 10) is licensed through the Nuclear Regulatory Commission.	Modifications are uncertain at this time. The feasibility of closed-system wet cooling towers is questionable. Because the CWA provides a high level of baseline protections, black abalone critical habitat is not likely to result in additional modifications.

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Activity	Specific areas	PCE and nature of the threat	Section 7 nexus	Possible modification(s) to the activity
Construction and operation of desalination plants.	4, 7, 8, 9, 10, 12, 17, and 19.	*Water quality* PCE—Discharge of hyper-saline water results in increased salinity and fluctuating salinity conditions that may affect sensitive organisms near the outfall. The impacts of brine effluent are generally more severe in rocky substrate than on sandy seafloor habitats. However, more research is needed on the tolerance level of black abalone for different salinities. Other effects of the discharge on water quality include increased turbidity, concentration of organic substances and metals contained in the feed waters, concentration of metals picked up through contact with the plant components, thermal pollution, and decreased oxygen levels. Entrainment and impingement of black abalone larvae may also occur from water intake at desalination plants, but this is primarily a take issue.	A desalination facility may require a Section 404 permit under the CWA from the USACE if it involves placing fill in navigable waters, and a Section 10 permit under the RHA if the proposal involves placing a structure in a navigable waterway.	Potential conservation efforts to mitigate desalination impacts may include the treatment of hyper-saline effluent to ensure that salinity levels are restored to normal values. The costs of treating hyper-saline effluent or finding an alternate manner of brine disposal can vary widely across plants depending on plant capacity and design.
Construction and operation of tidal and wave energy projects.	1 and 19	*Rocky substrate* PCE—Impacts on rocky substrate may result from the installation of power lines to transport power to shore. These projects typically involve placement of structures, such as buoys, cables, and turbines, in the water column. *Water quality* PCE—Alternative energy projects may result in reduced wave height by as much as 5 to 13 percent, which may benefit abalone habitat. Effects on wave height would generally only be observed 1–2 km away from the wave energy device. Another concern is the potential for liquids used in the system to leak or be accidentally spilled, resulting in release of toxic fluids. Toxins may also be released in the use of biocides to control the growth of marine organisms. The potential effects of coastal wave and tidal energy projects on black abalone habitat are uncertain, because these projects are relatively new and the impacts are very site-specific.	Subject to the Federal Energy Regulatory Commission (FERC) permitting and licensing requirements, as well as requirements under Section 401 of the CWA.	Use of non-toxic fluids instead of toxic fluids. When the project requires the use of power lines, use existing power lines, instead of constructing new ones, and avoid rocky intertidal areas.

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Activity	Specific areas	PCE and nature of the threat	Section 7 nexus	Possible modification(s) to the activity
Construction and operation of liquefied natural gas (LNG) projects.	Unknown ...	*Rocky substrate* PCE—Onshore LNG terminals involve construction of breakwaters, jetties, or other shoreline structures. The activities associated with construction (e.g., dredging) may affect black abalone habitat. Offshore LNG terminals involve construction of pipelines to transport LNG onshore and may affect rocky habitat. See sedimentation effects described under ''dredging'', ''in-water construction'', and ''coastal development''. *Food resource* and *water quality* PCEs—There is an increased potential for oil spills and potential effects on water quality from the presence of vessels transporting and offloading LNG at the terminals.	FERC has license authority for terminals built onshore and in state waters. The Maritime Administration and USCG have siting and permitting authority for deepwater ports in Federal waters. CWA permits under section 401 (water quality certificate) and/or section 404 (a dredge and fill permit) and Clean Air Act permits under section 502 may be required.	Offshore facilities: In the installation of pipelines, avoid rocky intertidal habitats or use existing pipelines. Onshore siting considerations: Avoid siting LNG projects within or adjacent to rocky intertidal habitats.
Mineral and petroleum exploration and extraction.	10	*Rocky substrate* PCE—This activity may result in increased sedimentation into rocky intertidal habitats. See sedimentation effects described under ''dredging'', ''in-water construction'', and ''coastal development''. *Food resources* and *settlement habitat* PCE—In a laboratory study, water-based drilling muds from an active platform were found to negatively affect the settlement of red abalone larvae on coralline algae, but fertilization and early development were not affected. *Water quality* PCE—The activity may cause an increased risk of oil spills or leaks and increased sedimentation thereby affecting water quality.	BOEMRE manages the nation's offshore energy and mineral resources, including oil, gas, and alternative energy sources, as well as sand, gravel and other hard minerals on the outer continental shelf.	Adoption of erosion control measures; adoption of oil spill clean-up protocols and oil spill prevention plans; more Clean Seas boats as first responders to prevent oil spills from coming onshore; and relocation of proposed oil platforms further away from black abalone habitats.
Non-native species introduction and management.	2, 4, 8, 10, and 11.	*Food resources* PCE—The release of wastewater, sewage, and ballast water from commercial shipping presents a risk to kelp and other macroalgal species because of the potential introduction of exotic species.	The National Invasive Species Act of 1996 (NISA) and the Nonindigenous Aquatic Nuisance Prevention and Control Act of 1990 under the USCG.	For commercial shipping: safe (non-contaminated) ballast disposal; rinse anchors and anchor chains when retrieving the anchor to remove organisms and sediments at their place of origin; remove hull fouling organisms from hull, piping, propellers, sea chests, and other submerged portions of a vessel, on a regular basis, and dispose of removed substances in accordance with local, state, and Federal law.
		Settlement habitat PCE—Non-native species may displace native organisms by preying on them or outcompeting them for resources such as food, space or both. Non-native species may introduce disease-causing organisms and can cause substantial population, community, and habitat changes.	.....	For aquaculture: inspect aquaculture facilities to prevent non-native species transport in packing materials.

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Activity	Specific areas	PCE and nature of the threat	Section 7 nexus	Possible modification(s) to the activity
Kelp harvesting.	7–20	*Food resources* PCE—Kelp is the primary source of food for black abalone. Kelp is harvested for algin, which is used as a binder, emulsifier, and molding material in a broad range of products, and as a food source in abalone aquaculture operations. The harvest is small, but the kelp grows quickly, and harvest could generate drift (which can potentially be beneficial to black abalone). Potential impacts related to kelp harvesting are unclear.	None	None.
Activities leading to global climate change (e.g., fossil fuel combustion).	1–20	Affects all PCEs. There is little information on these effects, however.	Uncertain	Uncertain.
		Water quality PCE—Sea surface water temperatures that exceed 25 °C may increase risks to black abalone. Ocean pH values that are outside of the normal range for seawater (i.e., pH less than 7.5 or greater than 8.5) may cause reduced growth and survivorship in abalone as has been observed in other marine gastropods (Shirayama and Thornton 2005). *Food resources* and *settlement habitat* PCE–Increasing partial pressure of carbon dioxide may reduce abundance of coralline algae and thereby affect the survival of newly settled black abalone (Feely *et al.* 2004; Hall-Spencer *et al.* 2008).		

Unoccupied Areas

Section 3(5)(A)(ii) of the ESA authorizes the designation of ''specific areas outside the geographical area occupied at the time [the species] is listed'' if these areas are essential for the conservation of the species. Regulations at 50 CFR 424.12(e) emphasize that the agency ''shall designate as critical habitat areas outside the geographical area presently occupied by a species only when a designation limited to its present range would be inadequate to ensure the conservation of the species.'' The CHRT identified potential unoccupied areas to consider for designation. These areas represent segments of the California and Oregon coast that contain rocky intertidal habitats that historically supported black abalone and that may support black abalone populations in the future. The CHRT identified the following unoccupied areas: (1) From Cape Arago State Park, Oregon, to Del Mar Landing Ecological Reserve, California; (2) from just south of Government Point to Point Dume State Beach, California; and (3) from Cardiff State Beach in Encinitas, California, to Cabrillo National Monument, California.

In each of these areas, black abalone have not been observed in surveys since 2005. In the area from Cape Arago, Oregon, to the Del Mar Landing Ecological Reserve, California, four museum specimens of black abalone were noted from two survey sites (Geiger 2004), one specimen was noted from another site where red abalone are considered common (Thompson 1920), and no data on black abalone were available for the other sites. Black abalone were not observed during rocky intertidal surveys conducted in the 1970s and 1980s at several sites within this area (pers. comm. with J. DeMartini, Humboldt State University, on February 11, 2010). In the area from just south of Government Point to Point Dume State Beach in California, black abalone were reported as rare at one site (Morin and Harrington 1979), but have never been observed at the other survey sites. In the area from Cardiff State Beach to Cabrillo National Monument in California, black abalone were noted to be historically present at a few sites (Zedler 1976, 1978) and rare at one site (California

State Water Resources Control Board 1979e).

In the proposed rule, we solicited information from the public regarding the historical, current, and potential condition of the habitat and of black abalone populations within the unoccupied areas identified above and the importance of these areas to conservation of the species. Although we received public comments in support of designating these unoccupied areas, we did not receive any additional information to inform our analysis of whether these unoccupied areas are essential for conservation of black abalone. At this time, the CHRT concluded that the three unoccupied areas may be essential for conservation, but that there is currently insufficient data to conclude that any of the areas are essential for conservation. For the unoccupied area from Cape Arago, Oregon, to the Del Mar Landing Ecological Reserve, California, the historical presence of black abalone was uncertain, because the only specimens available were museum specimens for which the origin was questionable. For the unoccupied areas from Government Point to Point Dume State Beach and from Cardiff State Beach to Cabrillo National Monument in California, there was insufficient information to indicate that expansion of black abalone populations into the areas is essential for recovery of the species. For example, we lack information needed to understand the historical importance of the populations within these unoccupied areas to the species as a whole (*e.g.,* as a source or sink population, or for connectivity with other populations throughout the coast). Therefore, the three presently unoccupied areas were not considered in further analyses. We note that we may revise the critical habitat designation as information about these areas becomes available in the future.

Military Lands

Under the Sikes Act of 1997 (Sikes Act) (16 U.S.C. 670a), ''each military installation that includes land and water suitable for the conservation and management of natural resources'' is required to develop and implement an integrated natural resources management plan (INRMP). An INRMP integrates implementation of the military mission of the installation with stewardship of the natural resources found there. Each INRMP includes: An assessment of the ecological needs on the military installation, including the need to provide for the conservation of listed species; a statement of goals and priorities; a detailed description of management actions to be implemented to provide for these ecological needs; and a monitoring and adaptive management plan. Each INRMP must, to the extent appropriate and applicable, provide for: Fish and wildlife management; fish and wildlife habitat enhancement or modification; wetland protection, enhancement, and restoration where necessary to support fish and wildlife; and enforcement of applicable natural resource laws. The ESA was amended by the National Defense Authorization Act for Fiscal Year 2004 (Pub. L. 108–136) to address the designation of military lands as critical habitat. ESA section 4(a)(3)(B)(i) states: ''The Secretary shall not designate as critical habitat any lands or other geographical areas owned or controlled by the Department of Defense, or designated for its use, that are subject to an integrated natural resources management plan prepared under section 101 of the Sikes Act (16 U.S.C. 670a), if the Secretary determines in writing that such plan provides a benefit to the species for which critical habitat is proposed for designation.''

The Navy's facilities at San Nicolas Island are covered by an INRMP that was recently revised and approved in May 2011. Under the revised San Nicolas Island INRMP, the Navy will conduct the following measures to address black abalone protection and conservation: (1) Continue to support black abalone surveys and studies on San Nicolas Island, such as Dr. Glenn VanBlaricom's ongoing monitoring surveys of black abalone; (2) conduct its own intertidal surveys to monitor black abalone and other intertidal species on San Nicolas Island; (3) develop and update outreach and education materials to incorporate information on black abalone and restrictions to protect the species; (4) maintain and enforce restricted areas on the south side of San Nicolas Island; and (5) continue to employ an adaptive management strategy for black abalone at San Nicolas Island by evaluating information collected through monitoring and research studies and incorporating management strategies based on that information into the INRMP. We concluded that the measures under the revised INRMP provide protection for black abalone populations and habitat on San Nicolas Island. In addition, the ongoing surveys have and will continue to inform conservation and management strategies for the recovery of black abalone on San Nicolas Island. Based on the benefits provided to black abalone under the revised San Nicolas Island INRMP, we determined under section 4(a)(3)(B) of the ESA that San Nicolas Island is no longer eligible for designation as critical habitat.

The Navy's facilities at San Clemente Island are covered by an INRMP that is scheduled to be revised in the next year. To provide for black abalone protection and conservation during the interim, the Navy has developed and adopted an amendment to the existing 2002 San Clemente Island INRMP. The amendment, signed and adopted in June 2011, contains several measures to address black abalone protection, management, and conservation on San Clemente Island. The amendment describes ongoing efforts by the Navy to benefit black abalone, including but not limited to: (1) Facilitating access to intertidal areas on San Clemente Island for scientific studies on black abalone; (2) continued bi-annual rocky intertidal surveys at four established MARINe sites on San Clemente Island; (3) continued enforcement of safety zone closures around San Clemente Island that prohibit or limit access to intertidal regions of the island; and (4) continued participation in programs such as the Southern California Mussel Watch Program and monitoring efforts in compliance with the State Water Resources Control Board Area of Special Biological Significance discharge regulations. Under the amendment, the Navy will also: (1) Create a rocky intertidal monitoring database for San Clemente Island, to be updated annually; (2) support and develop the monitoring of relevant environmental variables for black abalone, such as water temperature; and (3) update education and outreach materials to include information on black abalone and no-take restrictions for all abalone species, to prevent illegal harvest of abalone. Finally, the Navy will collaborate with NMFS and black abalone experts to develop a black abalone management plan for San Clemente Island, to include: (1) Data from historical black abalone abundance and habitat surveys; (2) a black abalone monitoring program; (3) a plan for regular reporting of information from the Navy to NMFS; and (4) a plan for continued coordination between the Navy and NMFS. We concluded that the amended INRMP provides for the protection of black abalone and its habitat on San Clemente Island. In addition, the ongoing surveys and future management plan will inform black abalone recovery efforts on San Clemente Island and provide a mechanism for NMFS and the Navy to collaborate closely on these efforts. Based on the benefits provided for black

abalone under the amendment to the 2002 San Clemente Island INRMP, we determined under section 4(a)(3)(B) of the ESA that San Clemente Island is no longer eligible for designation as critical habitat.

NMFS plans to coordinate with the Navy and participate in annual reviews of the implementation of the INRMPs. If NMFS determines that implementation of the INRMPs is not adequate to provide benefits to black abalone, NMFS may consider revising the critical habitat designation to re-evaluate the eligibility of San Nicolas Island and San Clemente Island for designation.

Application of ESA Section 4(b)(2)

Section 4(b)(2) of the ESA requires the Secretary of Commerce (Secretary) to consider the economic, national security, and any other relevant impacts of designating any particular area as critical habitat. Any particular area may be excluded from critical habitat if the Secretary determines that the benefits of excluding the area outweigh the benefits of designating the area. However, the Secretary may not exclude a particular area from designation if exclusion will result in the extinction of the species. Because the authority to exclude is discretionary, exclusion is not required for any areas. We exclude one occupied specific area (i.e., Corona Del Mar State Beach to Dana Point, Orange County, CA) from the critical habitat designation because the economic benefits of exclusion outweigh the benefits of designation.

The first step in conducting the ESA section 4(b)(2) analysis is to identify the ''particular areas'' to be analyzed. Where we considered economic impacts and weighed the economic benefits of exclusion against the conservation benefits of designation, we used the same biologically-based ''specific areas'' we identified in the previous sections pursuant to section 3(5)(A) of the ESA (*e.g.,* Del Mar Landing Ecological Reserve to Bodega Head, Bodega Head to Point Bonita, Farallon Islands, etc.). Delineating the ''particular areas'' as the same units as the ''specific areas'' allowed us to most effectively compare conservation benefits of designation with economic benefits of exclusion. Delineating particular areas based on impacts to national security or other relevant impacts was based on land ownership or control (*e.g.,* land controlled by the Department of Defense (DOD) within which national security impacts may exist, or Indian lands). We requested but did not receive information on any other relevant impacts that should be considered. Thus, our ESA section 4(b)(2) analysis focused on the economic impacts and impacts to national security.

The next step in the ESA section 4(b)(2) analysis involves identification of the impacts of designation (*i.e.,* the benefits of designation and the benefits of exclusion). We then weigh the benefits of designation against the benefits of exclusion to identify areas where the benefits of exclusion may outweigh the benefits of designation. The benefits of designation include the protections afforded to black abalone and its habitat by the critical habitat designation and the application of ESA section 7(a)(2). The benefits of exclusion, in this case, include the economic benefits and impacts on national security that would be avoided if a particular area were excluded from the critical habitat designation. The following sections describe how we determined the benefits of designation and the benefits of exclusion and how these benefits were weighed to identify particular areas that may be eligible for exclusion from the designation. We also summarize the results of this weighing process and our determinations regarding exclusion of any particular areas.

Impacts of Designation

The primary impact of a critical habitat designation stems from the requirement under section 7(a)(2) of the ESA that Federal agencies insure their actions are not likely to result in the destruction or adverse modification of critical habitat. Determining this impact is complicated by the fact that section 7(a)(2) of the ESA contains the overlapping requirement that Federal agencies must also insure their actions are not likely to jeopardize the species' continued existence. One incremental impact of designation is the extent to which Federal agencies modify their actions to insure their actions are not likely to destroy or adversely modify the critical habitat of the species, beyond any modifications they would make because of the listing and the jeopardy requirement. When a modification would be required due to impacts to both the species and critical habitat, the impact of the designation is considered co-extensive with the ESA listing of the species. Additional impacts of designation include state and local protections that may be triggered as a result of the designation and the benefits from educating the public about the importance of each area for species conservation. Thus, the impacts of the designation include conservation impacts for black abalone and its habitat, economic impacts, impacts on national security, and other relevant impacts that may result from the designation and the application of ESA section 7(a)(2).

In determining the impacts of the designation, we focused on the incremental change in Federal agency actions as a result of the critical habitat designation and the destruction/adverse modification provision, beyond the changes predicted to occur as a result of listing and the jeopardy provision (see *Arizona Cattle Growers* v. *Salazar,* 606 F. 3d 1160 (9th Cir. 2010)). We analyzed the impact of this designation based on a comparison of the world with and without black abalone critical habitat. We focused on the potential incremental impacts beyond the impacts that would result from the listing and jeopardy provision, and other baseline protections identified for black abalone habitat. In some instances where it was difficult to exclude potential impacts that may already occur under the baseline, we used our best professional judgment to identify and estimate the incremental impacts of the critical habitat designation.

Benefits of Designation

The primary benefit of designation is the protection afforded under section 7 of the ESA, requiring all Federal agencies to insure their actions are not likely to destroy or adversely modify designated critical habitat. This is in addition to the requirement that all Federal agencies insure their actions are not likely to jeopardize the continued existence of the species. In addition, the designation may provide education and outreach benefits by informing the public about areas and features important to the conservation of black abalone. By delineating areas of high conservation value, the designation may help focus and contribute to conservation efforts for black abalone and their habitats.

The designation of critical habitat has been found to benefit the status and recovery of ESA-listed species. Recent reports by the USFWS indicate that species with critical habitat are more likely to have increased and less likely to have declined than species without critical habitat (Taylor *et al.* 2005). In addition, species with critical habitat are also more likely to have a recovery plan and to have these plans implemented, compared to species without critical habitat (Harvey *et al.* 2002; Lundquist *et al.* 2002). These benefits may result from the unique, species-specific protections afforded by critical habitat (*e.g.,* enhanced habitat protection, increased public awareness and education of important habitats) that are more comprehensive than other

existing regulations (Hagen and Hodges 2006).

The benefits of designation are not directly comparable to the benefits of exclusion for the purposes of weighing the benefits under the ESA section 4(b)(2) analysis as described below. Ideally, the benefits of designation and benefits of exclusion should be monetized in order to directly compare and weigh them. With sufficient information, it may be possible to monetize the benefits of a critical habitat designation by first quantifying the benefits expected from an ESA section 7 consultation and translating that into dollars. We are not aware, however, of any available data to monetize the benefits of designation (*e.g.,* estimates of the monetary value of the PCEs within areas designated as critical habitat, or of the monetary value of education and outreach benefits). As an alternative approach, we determined the benefits of designation based on the CHRT's biological analysis of the specific areas. We used the CHRT's conservation value ratings (High, Medium, and Low) to represent the qualitative conservation benefits of designation for each of the specific areas considered for designation. In evaluating the conservation value of each specific area, the CHRT focused on the habitat features present in each area, the habitat functions provided by each area, and the importance of protecting the habitat for the overall conservation of the species. The CHRT considered a number of factors to determine the conservation value of each specific area, including: (a) The present condition of the primary constituent elements or PCEs; (b) the level at which the habitat supports recruitment of early life stages, based on the level of recruitment observed at survey sites within the area; and (c) the level at which the habitat supports long-term survival of juvenile and adult black abalone, based on trends in the abundance and size frequencies of black abalone populations observed at survey sites within the area. These conservation value ratings represent the estimated conservation impact to black abalone and its habitat if the area were designated as critical habitat, and thus were used to represent the benefit of designation. The final Biological Report (NMFS 2011a) provides detailed information on the CHRT's biological analysis and evaluation of each specific area.

Benefits of Exclusion Based on Economic Impacts and Final Exclusions

The economic benefits of exclusion are the economic impacts that would be avoided by excluding particular areas from the designation. To determine these economic impacts, we first asked the CHRT to identify activities within each specific area that may affect black abalone and its critical habitat. The 17 categories of activities identified by the CHRT are identified in the ''Special Management Considerations and Protections'' section above. We then considered the range of modifications NMFS might seek in these activities to avoid destroying or adversely modifying black abalone critical habitat. Where possible, we focused on modifications beyond those that may be required under the jeopardy provision. Because of the limited consultation history, we relied on information from other ESA section 7 consultations and the CHRT's expertise to determine the types of activities and potential range of modifications. For each potential impact, we tried to provide information on whether the impact is more closely associated with destruction/adverse modification or with jeopardy, to distinguish the impacts of applying the jeopardy provision versus the destruction/adverse modification provision.

While the statute and our agency guidance directs us to identify activities that may affect the habitat features important to black abalone conservation within a specific area in order to determine its eligibility for designation, not all of these activities may be affected by the critical habitat designation (*i.e.,* subject to an ESA section 7 consultation) and sustain an economic impact. It is only those activities with a federal nexus (*i.e.,* actions funded, authorized, or carried out by a Federal agency or agencies) that could sustain an economic impact as a result of the designation. Within the set of activities identified in the ''Special Management Considerations and Protections'' section above, we were only able to estimate economic impacts for a subset of them because of: (1) The limited consultation history; (2) uncertainty in the types of modification that would be required; (3) uncertainty in the number and locations of activities based on currently available data; and (4) the lack of available cost data. The final Economic Analysis Report (NMFS 2011b) analyzes the potential economic impacts to the following categories of activities: (1) Coastal development; (2) in-water construction; (3) sand replenishment or beach nourishment activities; (4) agricultural activities (*e.g.,* irrigation); (5) NPDES-permitted activities and activities generating non-point source pollution; (6) sediment disposal activities associated with road maintenance, repair, and construction (''sidecasting''); and (7) construction and operation of alternative energy hydrokinetic projects (tidal or wave energy projects). The following activities were discussed qualitatively: Dredging and disposal of dredged material; agricultural pesticide application and livestock farming; mineral and petroleum exploration or extraction; construction and operation of LNG projects; construction and operation of desalination plants; oil and chemical spills and response; power generation operations involving water withdrawal from and discharge to marine coastal waters (*e.g.,* coastal power plants with once-through cooling systems); vessel grounding incidents and response; non-native species introduction and management; kelp harvesting; and activities that lead to global climate change. The economic impacts of the designation on these activities could not be quantified because a federal nexus does not exist (*i.e.,* for kelp harvesting activities) or is uncertain (*i.e.,* for activities that lead to global climate change), or because the potential economic impacts are uncertain, for the reasons described above. The final Economic Analysis Report (NMFS 2011b) provides a more detailed description and analysis of the potential economic impacts to each of these categories of activities.

We had sufficient information to monetize the economic benefits of exclusion, but were not able to monetize the conservation benefits of designation. Thus, to weigh the benefits of designation against the economic benefits of exclusion, we compared the conservation value ratings with economic impact ratings that were based on the mid-annualized economic impact estimates (*i.e.,* the midpoint between the low and high annualized economic impact estimates; see final Economic Analysis Report (NMFS 2011b) for additional details) for each specific area. To develop the economic impact ratings, we examined the mid-annualized economic impacts across all of the specific areas. We then divided the economic impacts into four economic impact rating categories corresponding to ''Low'' ($0 to $90,000), ''Medium'' (greater than $90,000 to $400,000), ''High'' (greater than $400,000 to $1 million), and ''Very High'' (greater than $1 million) economic impact ratings. We note that these thresholds differ from the thresholds applied in the proposed rule (*i.e.,* ''Low'' = $0 to $100,000, ''Medium'' = greater than $100,000 to

$500,000), ''High'' = greater than $500,000 to $10 million, and ''Very High'' = greater than $10 million). Revisions made to the economic impacts analysis for power plants and oil and chemical spill response activities resulted in revised economic impact estimates (see Response to Comments 23 and 25). The revised mid-annualized economic impact estimates decreased from a total of about $77 million to about $2 million. As a result, we revised the thresholds, using the same approach as we used in the proposed rule to establish the thresholds. The four economic impact rating categories were determined by examining all of the economic impact values and identifying natural breakpoints in the data where the estimated economic impacts showed a large increase. Because the overall range of mid-annualized economic impact estimates per specific area was low (ranging from $0 to $508,000), we established the threshold for the ''Very High'' economic impact rating based on the highest ''high'' total annualized impact estimate for a specific area (*i.e.,* $1,004,000 for specific area 7). We then balanced these economic impact ratings (representing the benefits of exclusion) with the conservation value ratings (representing the benefits of designation), applying the following decision rules: (1) Areas with a conservation value rating of ''High'' were eligible for exclusion if the mid-annualized economic impact estimate exceeded $1 million (*i.e.,* the economic impact rating was ''Very High''); (2) areas with a conservation value rating of ''Medium'' were eligible for exclusion if the mid-annualized economic impact estimate exceeded $400,000 (*i.e.,* the economic impact rating was at least a ''High''); and (3) areas with a conservation value rating of ''Low'' were eligible for exclusion if the mid-annualized economic impact estimate exceeded $90,000 (*i.e.,* the economic impact rating was at least a ''Medium''). These dollar thresholds should not be interpreted as estimates of the dollar value of High, Medium, or Low conservation value areas.

For critical habitat, the ESA directs us to consider exclusions to avoid high economic impacts, but also requires that the areas designated as critical habitat are sufficient to support the conservation of the species and to avoid extinction. And, under the ESA, the decision to exclude is discretionary. It is within this framework that we developed decision rules with thresholds representing the levels at which we believe the economic benefit of exclusion associated with a specific area should be compared against the conservation benefits of designation. These dollar thresholds and decision rules provided a relatively straightforward process to identify, using the best available data, specific areas warranting consideration for exclusion based on economic impacts.

Based on this analysis, one area was identified preliminarily as eligible for exclusion: Specific area 12, from Corona Del Mar State Beach to Dana Point. We presented the area to the CHRT to help us further characterize the benefits of designation by determining whether excluding this area would significantly impede conservation of black abalone. If exclusion of an area would significantly impede conservation, then the benefits of exclusion would likely not outweigh the benefits of designation for that area. The CHRT considered this question in the context of the information they had developed in providing the conservation value ratings. If the CHRT determined that exclusion of the area would significantly impede conservation of black abalone, the conservation benefits of designation were increased one level in the weighing process. This necessitated the creation of a Very High conservation value rating. Areas rated as ''Very High'' were deemed to have a very high likelihood of promoting the conservation of the species.

The CHRT determined, and we concur, that exclusion of specific area 12 (from Corona Del Mar State Beach to Dana Point) would not significantly impede conservation of black abalone and that the economic benefit of exclusion for this area outweighs the conservation benefit of designation. Based on the CHRT's biological assessment as described below, we also determined that exclusion of specific area 12 will not result in the extinction of black abalone. The CHRT based their determinations on the best available data regarding the present condition of the habitat and black abalone populations in the area. The CHRT gave the area a ''Low'' conservation value, because the current habitat conditions are of lower quality compared to other areas along the coast. While rocky intertidal habitat of good quality occurs within the area, these habitats are patchy and may be affected by sand scour due to the presence of many sandy beaches. In addition, the rocky habitat within the area consists of narrow benches and fewer crevices compared to other areas and has been degraded by the establishment of sandcastle worm (*Phragmatopoma californica*) colonies. There is also little to no coralline algae to provide adequate larval settlement habitat. Low densities of black abalone were observed at a few sites in the area in the 1970s and 1980s. However, no recruitment has been observed and black abalone have been absent from the area except for one black abalone found in January 2010. For these reasons, the CHRT concluded that excluding specific area 12 (from Corona Del Mar State Beach to Dana Point) from the designation would not significantly impede the conservation of black abalone. We also concluded that excluding specific area 12 will not result in the extinction of the species, based on the CHRT's assessment that the area contains habitat of lower quality for black abalone and the lack of evidence to indicate that this area historically supported high densities of black abalone. The estimated economic impact rating for this area was a Medium, with a mid-annualized economic impact estimate of $104,400. Most of the costs for this area were attributed to NPDES-permitted activities, agricultural irrigation, and oil and chemical spill prevention and clean-up. Previously, the economic impact estimate for this specific area included high costs to a proposed desalination plant, based on the costs for using alternate methods of brine disposal (*i.e.,* injection wells). However, based on information provided through public comments, it was determined that the proposed desalination plant plans to dispose of its residual brine by mixing it with wastewater to be discharged through an existing outfall at 1.5 miles offshore. It is uncertain whether there would be effects on black abalone habitat, and thus the costs to this proposed desalination plant were discussed qualitatively rather than quantitatively (*i.e.,* essentially considered as zero costs in the total annualized economic impact estimate).

We note that in the proposed rule, specific area 10 (from Montaña de Oro State Park to just south of Government Point) was eligible for exclusion based on a Very High economic impact rating. However, based on revised economic impact estimates for the DCNPP (see Response to Comment 23 above), the total mid-annualized economic impact estimate for this area decreased from about $75.5 million to about $456,000. Based on this revised economic impact estimate, specific area 10 (rated as a High conservation value area) is no longer eligible for exclusion based on economic impacts.

In summary, we are excluding specific area 12 (from Corona Del Mar State Beach to Dana Point) from the critical habitat designation. Based on the best scientific and commercial data

currently available, we have determined that exclusion of this area will not result in the extinction of the species, because the area contains habitat of low quality for black abalone and historically did not support high densities of black abalone.

Benefits of Exclusion Based on National Security and Final Exclusions

The national security benefits of exclusion are the impacts on national security that would be avoided by excluding particular areas from the designation. We contacted representatives of the DOD to request information on potential national security impacts that may result from the designation of particular areas as critical habitat for black abalone. In a letter dated May 20, 2010 (5090 Ser N40 JJR.cs/0011), representatives of the DOD identified the following particular areas owned or controlled by the U.S. Navy and requested exclusion of these areas from the designation based on potential national security impacts: (1) Naval Auxiliary Landing Field (NALF) San Clemente Island; (2) Outlying Landing Field (OLF) San Nicolas Island; (3) Naval Support Detachment Monterey; (4) Naval Weapons Station Seal Beach; and (5) Naval Base Ventura County (Point Mugu and Port Hueneme). As stated in the proposed rule, we determined that the Naval Support Detachment Monterey, Naval Weapons Station Seal Beach, and Naval Base Ventura County do not occur within the specific areas being considered for designation, but that San Clemente Island and San Nicolas Island do occur within the specific areas being considered for designation.

During the public comment period, we received a comment letter from the U.S. Navy, requesting the exclusion of San Clemente Island from the designation based on national security impacts, as well as based on the forthcoming amendment to the existing San Clemente Island INRMP. As stated in the ''Military Lands'' section above, we have coordinated with the Navy to develop an amendment to the existing 2002 San Clemente Island INRMP to address black abalone protection and conservation. Upon adoption of the amendment to the 2002 San Clemente Island INRMP, we determined under section 4(a)(3)(B) of the ESA that San Clemente Island is no longer eligible for designation, based on the benefits to black abalone conservation under the amended INRMP. Thus, consideration of exclusion based on national security impacts is no longer necessary.

In the comment letter, the Navy did not request exclusion of San Nicolas Island based on national security impacts, instead requesting that San Nicolas Island be found ineligible for designation under section 4(a)(3)(B) of the ESA based on the benefits to black abalone conservation under the revised San Nicolas Island INRMP (see ''Military Lands'' section of this rule). Thus, consideration of exclusion based on national security impacts again is no longer necessary.

Benefits of Exclusion for Other Relevant Impacts

The only other relevant impacts of the designation identified were potential impacts on Indian lands. As stated in the proposed rule, we reviewed maps indicating that none of the specific areas under consideration for designation as critical habitat overlap with Indian lands. We solicited information from the public regarding any Indian lands that may overlap with and may warrant exclusion from the designation, but did not receive any additional information on Indian lands or any other relevant impacts. Therefore, no areas were considered for exclusion based on impacts on Indian lands or any other relevant impacts.

Critical Habitat Designation

This rule designates approximately 360 square kilometers of habitat in California within the geographical area presently occupied by black abalone as critical habitat. These critical habitat areas contain physical or biological features essential to the conservation of the species that may require special management considerations or protection. This rule excludes from the designation the area from Corona Del Mar State Beach to Dana Point, Orange County, CA. Although we have identified three presently unoccupied areas, we are not designating any unoccupied areas as critical habitat at this time, because we do not have sufficient information to determine that any of the unoccupied areas are essential to the conservation of the species.

Lateral Extent of Critical Habitat

The lateral extent of the critical habitat designation offshore is defined by the −6 m depth bathymetry contour relative to the MLLW line and shoreward to the MHHW line. The textual descriptions of critical habitat in the section titled ''226.220 Critical habitat for the black abalone (*Haliotis cracherodii*)'' are the definitive source for determining the critical habitat boundaries. The overview maps provided in the section titled ''226.220 Critical habitat for the black abalone (*Haliotis cracherodii*)'' are provided for general guidance purposes only and not as a definitive source for determining critical habitat boundaries. As discussed in previous critical habitat designations, human activities that occur outside of designated critical habitat can destroy or adversely modify the essential physical and biological features of these areas. This designation will help to ensure that Federal agencies are aware of the impacts that activities occurring inside and outside of the critical habitat area (*e.g.,* coastal development, activities that exacerbate global warming, agricultural irrigation and pesticide application) may have on black abalone critical habitat.

Effects of Critical Habitat Designation

ESA Section 7 Consultation

Section 7(a)(2) of the ESA requires Federal agencies, including NMFS, to ensure that any action authorized, funded, or carried out by the agency (agency action) does not jeopardize the continued existence of any threatened or endangered species or destroy or adversely modify designated critical habitat. When a species is listed or critical habitat is designated, Federal agencies must consult with NMFS on any agency actions to be conducted in an area where the species is present and that may affect the species or its critical habitat. During the consultation, NMFS evaluates the agency action to determine whether the action may adversely affect listed species or critical habitat and issues its findings in a biological opinion. If NMFS concludes in the biological opinion that the agency action would likely result in the destruction or adverse modification of critical habitat, NMFS would also recommend any reasonable and prudent alternatives to the action. Reasonable and prudent alternatives are defined in 50 CFR 402.02 as alternative actions identified during formal consultation that can be implemented in a manner consistent with the intended purpose of the action, that are consistent with the scope of the Federal agency's legal authority and jurisdiction, that are economically and technologically feasible, and that would avoid the destruction or adverse modification of critical habitat. Regulations at 50 CFR 402.16 require Federal agencies that have retained discretionary involvement or control over an action, or where such discretionary involvement or control is authorized by law, to reinitiate consultation on previously reviewed actions in instances where: (1) Critical habitat is subsequently designated; or (2) new information or changes to the

action may result in effects to critical habitat not previously considered in the biological opinion. Consequently, some Federal agencies may request reinitiation of consultation or conference with NMFS on actions for which formal consultation has been completed, if those actions may affect designated critical habitat. Activities subject to the ESA section 7 consultation process include activities on Federal lands and activities on private or state lands requiring a permit from a Federal agency (*e.g.,* a section 10(a)(1)(B) permit from NMFS) or some other Federal action, including funding (*e.g.,* Federal Highway Administration (FHA) or Federal Emergency Management Agency (FEMA) funding). ESA section 7 consultation would not be required for Federal actions that do not affect listed species or critical habitat nor for actions on non-Federal and private lands that are not federally funded, authorized, or carried out.

Activities Likely To Be Affected

ESA section 4(b)(8) requires, to the maximum extent practicable, in any regulation to designate critical habitat, an evaluation and brief description of those activities (whether public or private) that may adversely modify such habitat or that may be affected by such designation. A wide variety of activities may affect black abalone critical habitat and may be subject to the ESA section 7 consultation process when carried out, funded, or authorized by a Federal agency. The activities most likely to be affected by this critical habitat designation are: (1) Coastal development; (2) in-water construction; (3) sand replenishment or beach nourishment activities; (4) agricultural activities (*e.g.,* irrigation); (5) NPDES-permitted activities and activities generating non-point source pollution; (6) sediment disposal activities associated with road maintenance, repair, and construction (sidecasting); (7) oil and chemical spills and clean-up activities; (8) construction and operation of power plants that take in and discharge water from the ocean; (9) construction and operation of alternative energy hydrokinetic projects (tidal or wave energy projects); and (10) construction and operation of desalination plants. Private entities may also be affected by this critical habitat designation if a Federal permit is required or Federal funding is received. These activities would need to be evaluated with respect to their potential to destroy or adversely modify critical habitat. Changes to the actions to minimize or avoid destruction or adverse modification of designated critical habitat may result in changes to some activities. Please see the final Economic Analysis Report (NMFS 2011b) for more details and examples of changes that may need to occur in order for activities to minimize or avoid destruction or adverse modification of designated critical habitat. Questions regarding whether specific activities would constitute destruction or adverse modification of critical habitat should be directed to NMFS (see **ADDRESSES** and **FOR FURTHER INFORMATION CONTACT**).

Peer Review

On December 16, 2004, the Office of Management and Budget (OMB) issued its Final Information Quality Bulletin for Peer Review (Bulletin). The Bulletin was published in the **Federal Register** on January 14, 2005 (70 FR 2664), and went into effect on June 16, 2005. The primary purpose of the Bulletin is to improve the quality and credibility of scientific information disseminated by the Federal government by requiring peer review of ''influential scientific information'' and ''highly influential scientific information'' prior to public dissemination. Influential scientific information is defined as ''information the agency reasonably can determine will have or does have a clear and substantial impact on important public policies or private sector decisions.'' The Bulletin provides agencies broad discretion in determining the appropriate process and level of peer review. Stricter standards were established for the peer review of ''highly influential scientific assessments,'' defined as information whose ''dissemination could have a potential impact of more than $500 million in any one year on either the public or private sector or that the dissemination is novel, controversial, or precedent-setting, or has significant interagency interest.'' The final Biological Report and final Economic Analysis Report supporting this rule to designate critical habitat for the black abalone are considered influential scientific information and subject to peer review. These two reports were each distributed to three independent peer reviewers for review during the public comment period. The peer reviewer comments were compiled into a peer review report and are available on the Federal eRulemaking Portal Web site (see **ADDRESSES**).

Required Determinations

Regulatory Planning and Review (E.O. 12866)

This rule has been determined to be significant for purposes of Executive Order (E.O.) 12866. A final Economic Analysis Report and ESA Section 4(b)(2) Report have been prepared to support the exclusion process under section 4(b)(2) of the ESA and our consideration of alternatives to this rulemaking as required under E.O. 12866. The reports are available on the Southwest Region Web site at *http://swr.nmfs.noaa.gov/abalone*, on the Federal eRulemaking Web site at *http://www.regulations.gov*, or upon request (see **ADDRESSES**).

Regulatory Flexibility Act (5 U.S.C. 601 et seq.)

Under the Regulatory Flexibility Act (RFA) (5 U.S.C. 601 *et seq.,* as amended by the Small Business Regulatory Enforcement Fairness Act (SBREFA) of 1996), whenever an agency publishes a notice of rulemaking for any proposed or final rule, it must prepare and make available for public comment a regulatory flexibility analysis describing the effects of the rule on small entities (*i.e.,* small businesses, small organizations, and small government jurisdictions). We have prepared a final regulatory flexibility analysis (FRFA), which is part of the final Economic Analysis Report (NMFS 2011b). This document is available upon request (see **ADDRESSES**), via our Web site at *http://swr.nmfs.noaa.gov*, or via the Federal eRulemaking Web site at *http://www.regulations.gov*.

In summary, the FRFA did not consider all types of small businesses that could be affected by the black abalone critical habitat designation due to lack of information needed to identify the number of potentially affected small businesses for each activity type and to conduct a quantitative analysis of the costs for small businesses of each activity type. Impacts to small businesses involved in 8 activities were considered: (1) In-Water construction; (2) dredging and disposal of dredged material; (3) NPDES-permitted facilities that discharge water into or adjacent to the coastal marine environment; (4) coastal urban development; (5) agriculture (including pesticide use, irrigation, and livestock farming); (6) construction and operation of tidal and wave energy projects; (7) construction and operation of LNG projects; and (8) mineral and petroleum exploration and extraction. The FRFA estimates the potential number of small businesses that may be affected by this rule, and the average annualized impact per entity for a given area and activity type. Specifically, based on an examination of the North American Industry Classification System (NAICS), this analysis classifies the potentially affected economic activities into

industry sectors and provides an estimate of the number of small businesses affected in each sector based on the applicable NAICS codes. We were only able to identify NAICS codes for the 8 activity types listed above.

The specific areas considered for designation as critical habitat, and hence the action area for this rule, span from the Del Mar Landing Ecological Reserve to Dana Point in California, including several offshore islands. Although the areas of concern include marine areas off the coast, the small business analysis is focused on land based areas where most economic activities occur and which could be affected by the designation.

Ideally, this analysis would directly identify the number of small entities that are located within the coastal areas adjacent to the specific areas. However, it is not possible to directly determine the number of firms in each industry sector within these areas because business activity data is maintained at the county level. Therefore, this analysis provides a maximum number of small businesses that could be affected. This number is most likely inflated since all of the identified small businesses are unlikely to be located in close proximity to the specific areas.

After determining the number of small entities, this analysis estimates the impact per entity for each area and industry sector. The following steps were used to provide these estimates: (1) Total impact for every area and activity type was determined based on the results presented in the final Economic Analysis Report (NMFS 2011b); (2) the proportion of businesses that were small was calculated for every area for every activity type; (3) the impact to small businesses for every area and activity type was estimated by multiplying the total impacts estimated for all businesses with the proportion of businesses that were determined to be small; and (4) the average impact per small businesses was estimated by taking the ratio of the total estimated impacts to the total number of small businesses.

There is a maximum of 3,560 small businesses involved in activities most likely to be affected by this rule. This is based on the assumption that all small businesses counted across areas and activity types are separate entities. However, it is likely that a particular small business may appear multiple times as being affected by conservation measures for multiple areas and activity types. Hence, total small business estimates across areas and activity types are likely to be overestimated. The potential annualized impacts borne by small entities were highest for specific area 3 (Farallon Islands) with potential impacts estimated at $194,000. This was mainly due to the impacts on the NPDES-permitted facilities, which account for 100 percent of the total costs. It is important to note here that these costs are likely overestimated, due to the fact that the spatial scope for analyzing the impacts of the designation on NPDES-permitted facilities for specific area 3 included NPDES-permitted facilities in the counties surrounding San Francisco Bay (see Section 1.4.1 of the final economic analysis report). Specific areas 2, 3, 4, 11, and 19 each had total estimated annualized small business impacts between $100,000 to $200,000.

In accordance with the requirements of the RFA (as amended by SBREFA of 1996), this analysis considered various alternatives to the critical habitat designation for the black abalone. The alternative of not designating critical habitat for the black abalone was considered and rejected because such an approach does not meet the legal requirements of the ESA. We considered the alternative of designating all specific areas (*i.e.,* no areas excluded). The total estimated annualized economic impact (for all potentially affected entities) associated with this alternative ranged from $169,000 to $4,083,000. However, the benefits of excluding specific area 12 (Corona Del Mar to Dana Point) outweighed the benefits of including it in the designation. Thus, NMFS also considered the alternative of designating all specific areas, but excluding specific area 12. The total estimated annualized economic impact (for all potentially affected entities) associated with this alternative ranged from $158,000 to $3,886,000. This alternative helps to reduce the number of small businesses potentially affected from 3,509 to 3,060. The total potential annualized economic impact to small businesses is also reduced from $817,000 to $789,000.

E.O. 13211

On May 18, 2001, the President issued an Executive Order on regulations that significantly affect energy supply, distribution, and use. E.O. 13211 requires agencies to prepare Statements of Energy Effects when undertaking an action expected to lead to the promulgation of a final rule or regulation that is a significant regulatory action under E.O. 12866 and is likely to have a significant adverse effect on the supply, distribution, or use of energy. An energy impacts analysis was prepared under E.O. 13211 and is available as part of the final Economic Analysis Report (NMFS 2011b). The results of the analysis are summarized here.

The Office of Management and Budget (OMB) provides guidance for implementing this Executive Order, outlining nine outcomes that may constitute ''a significant adverse effect'' when compared with the regulatory action under consideration: (1) Reductions in crude oil supply in excess of 10,000 barrels per day (bbls); (2) reductions in fuel production in excess of 4,000 bbls; (3) reductions in coal production in excess of 5 million tons per year; (4) reductions in natural gas production in excess of 25 million cubic feet per year; (5) reductions in electricity production in excess of 1 billion kilowatts-hours per year or in excess of 500 megawatts of installed capacity; (6) increases in energy use required by the regulatory action that exceed the thresholds above; (7) increases in the cost of energy production in excess of one percent; (8) increases in the cost of energy distribution in excess of one percent; or (9) other similarly adverse outcomes.

Of these, the most relevant criteria to this analysis are potential changes in natural gas and electricity production, as well as changes in the cost of energy production. Possible energy impacts may occur as the result of requested project modifications to power plants, tidal and wave energy projects, and LNG facilities. There is currently only one power plant, the Diablo Canyon Nuclear Power Plant (DCNPP), located within an area that could be affected by black abalone critical habitat. As described previously, the high level of baseline protections provided under the CWA make it highly unlikely that additional modifications beyond those required under existing regulations would result due to this black abalone critical habitat designation. Therefore, we concluded that this designation is not likely to result in incremental impacts to the cost of operating the DCNPP and, consequently, is not likely to result in impacts to energy production and associated costs.

The number of future tidal and wave energy projects that will be constructed within the specific areas is unknown. Currently, there are no actively-generating wave or tidal energy projects located within the study area. However, four projects have received preliminary permits from FERC (FERC. Issued and valid hydrokinetic projects preliminary permit. Accessed at: *http://www.ferc.gov/industries/hydropower/indus-act/hydrokinetics/permits-issued.xls* on April 5, 2010). Future management and required project modifications for black abalone critical

habitat related to tidal and wave energy projects are uncertain and could vary widely in scope from project to project. Moreover, because the proposed projects are still in the preliminary stages, the potential impact of possible black abalone conservation efforts on the project's energy production and the associated cost of that energy are unclear. Proposed tidal and wave energy projects within the study area have a combined production capacity of 21 megawatts. It is more likely that any additional cost of black abalone conservation efforts would be passed on to the consumer in the form of slightly higher energy prices. That said, any increase in energy prices as a result of black abalone conservation would have to be balanced against changes in energy prices resulting from the development of these projects. That is, the construction of tidal and wave energy projects may result in a general reduction in energy prices in affected areas. Without information about the effect of the tidal and wave projects on future electricity prices and more specific information about recommended conservation measures for black abalone, this analysis is unable to forecast potential energy impacts resulting from changes to tidal and wave energy projects.

Similar to tidal and wave energy projects, the number of future LNG projects that will be built within the specific areas is unknown. Many LNG projects are likely to be abandoned during the development stages for reasons unrelated to black abalone critical habitat. In addition, the potential impact of LNG facilities on black abalone habitat remains uncertain, as is the nature of any project modifications that might be requested to mitigate adverse impacts. Since there are no LNG projects in the development stage, the potential impact of possible black abalone conservation efforts on the project's energy production and the associated cost of that energy are unclear. Project modifications may include biological monitoring, spatial restrictions on project installation, and specific measures to prevent or respond to catastrophes. Out of these project modifications, spatial restrictions on project installation could have effects on energy production. This modification could increase LNG construction costs, which may result in higher natural gas costs. However, the construction of LNG facilities and associated increased energy supplies to consumers aim to generally result in lower energy prices than would have otherwise been expected. Therefore, this analysis is unable to forecast potential energy impacts resulting from changes to LNG projects without specific information about recommended black abalone conservation measures or future forecasts of energy prices that reflect future markets with increased energy supplies from LNG projects.

Unfunded Mandates Reform Act (2 U.S.C. 1501 et seq.)

In accordance with the Unfunded Mandates Reform Act, NMFS makes the following findings:

(A) This final rule would not produce a Federal mandate. In general, a Federal mandate is a provision in legislation, statute, or regulation that would impose an enforceable duty upon State, local, tribal governments, or the private sector and includes both ''Federal intergovernmental mandates'' and ''Federal private sector mandates.'' These terms are defined in 2 U.S.C. 658(5)–(7). ''Federal intergovernmental mandate'' includes a regulation that ''would impose an enforceable duty upon State, local, or tribal governments'' with two exceptions. It excludes ''a condition of Federal assistance.'' It also excludes ''a duty arising from participation in a voluntary Federal program,'' unless the regulation ''relates to a then-existing Federal program under which $500,000,000 or more is provided annually to State, local, and tribal governments under entitlement authority,'' if the provision would ''increase the stringency of conditions of assistance'' or ''place caps upon, or otherwise decrease, the Federal Government's responsibility to provide funding'' and the State, local, or tribal governments ''lack authority'' to adjust accordingly. ''Federal private sector mandate'' includes a regulation that ''would impose an enforceable duty upon the private sector, except (i) a condition of Federal assistance; or (ii) a duty arising from participation in a voluntary Federal program.'' The designation of critical habitat does not impose an enforceable duty on non-Federal government entities or private parties. The only regulatory effect of a critical habitat designation is that Federal agencies must ensure that their actions do not destroy or adversely modify critical habitat under ESA section 7. Non-Federal entities that receive funding, assistance, or permits from Federal agencies, or otherwise require approval or authorization from a Federal agency for an action may be indirectly affected by the designation of critical habitat. Furthermore, to the extent that non-Federal entities are indirectly impacted because they receive Federal assistance or participate in a voluntary Federal aid program, the Unfunded Mandates Reform Act would not apply, nor would critical habitat shift the costs of the large entitlement programs listed above to state governments.

(B) Due to the prohibition against take of black abalone both within and outside of the designated areas, we do not anticipate that this final rule would significantly or uniquely affect small governments. As such, a Small Government Agency Plan is not required.

Takings

Under E.O. 12630, Federal agencies must consider the effects of their actions on constitutionally protected private property rights and avoid unnecessary takings of property. A taking of property includes actions that result in physical invasion or occupancy of private property, and regulations imposed on private property that substantially affect its value or use. In accordance with E.O. 12630, this final rule would not have significant takings implications. A takings implication assessment is not required. The designation of critical habitat affects only Federal agency actions. This final rule would not increase or decrease the current restrictions on private property concerning take of black abalone, nor do we expect the critical habitat designation to impose substantial additional burdens on land use or substantially affect property values. Additionally, the critical habitat designation would not preclude the development of Habitat Conservation Plans and issuance of incidental take permits for non-Federal actions. Owners of areas included within the critical habitat designation would continue to have the opportunity to use their property in ways consistent with the survival of endangered black abalone.

Federalism

In accordance with E.O. 13132, we determined that this final rule would not have significant Federalism effects and that a Federalism assessment is not required. This designation may have some benefit to state and local resource agencies in that the areas essential to the conservation of the species are more clearly defined, and the PCEs of the habitat necessary for the survival of black abalone are specifically identified. While this designation would not alter where and what non-federally sponsored activities may occur, it may assist local governments in long-range planning.

Civil Justice Reform

In accordance with E.O. 12988, we have determined that this final rule would not unduly burden the judicial system and meets the requirements of sections 3(a) and 3(b)(2) of the E.O. We are designating critical habitat in accordance with the provisions of the ESA. This final rule uses standard property descriptions and identifies the PCEs within the designated areas to assist the public in understanding the habitat needs of black abalone.

Paperwork Reduction Act of 1995 (44 U.S.C. 3501 et seq.)

This final rule does not contain new or revised information collections that require approval by the OMB under the Paperwork Reduction Act. This final rule would not impose recordkeeping or reporting requirements on State or local governments, individuals, businesses, or organizations.

National Environmental Policy Act of 1969 (NEPA)

We have determined that an environmental analysis as provided for under the NEPA of 1969 for critical habitat designations made pursuant to the ESA is not required. See *Douglas County* v. *Babbitt,* 48 F.3d 1495 (9th Cir. 1995), cert. denied, 116 S.Ct 698 (1996).

Coastal Zone Management Act of 1972 (CZMA)

The CZMA emphasizes the primacy of state decision-making regarding the coastal zone. Section 307 of the CZMA (16 U.S.C. 1456), called the Federal consistency provision, is a major incentive for states to join the national coastal management program and is a powerful tool that states use to manage coastal uses and resources and to facilitate cooperation and coordination with federal agencies.

Federal consistency is the CZMA requirement where Federal agency activities that have reasonably foreseeable effects on any land or water use or natural resource of the coastal zone (also referred to as coastal uses or resources and coastal effects) must be consistent to the maximum extent practicable with the enforceable policies of a coastal state's federally approved coastal management program. We have determined that this final critical habitat designation is consistent to the maximum extent practicable with the enforceable policies of the approved Coastal Zone Management Program of California. This determination was submitted for review by the California Coastal Commission.

Government-to-Government Relationship With Tribes

As described in the section above titled ''Exclusions Based on Other Relevant Impacts,'' we have not identified any tribal lands that overlap with the critical habitat designation for black abalone.

References Cited

A complete list of all references cited herein is available upon request (see **ADDRESSES** section) or via our Web site at *http://swr.nmfs.noaa.gov/abalone*.

List of Subjects in 50 CFR Part 226

Endangered and threatened species.

Dated: October 18, 2011.

John Oliver,

Deputy Assistant Administrator for Operations, National Marine Fisheries Service.

For the reasons set out in the preamble, 50 CFR part 226 is amended as set forth below:

PART 226—DESIGNATED CRITICAL HABITAT

■ 1. The authority citation of part 226 continues to read as follows:

Authority: 16 U.S.C. 1533.

■ 2. Add § 226.221 to read as follows:

§ 226.221 Critical habitat for black abalone (Haliotis cracherodii).

Critical habitat is designated for black abalone as described in this section. The textual descriptions of critical habitat in this section are the definitive source for determining the critical habitat boundaries. The overview maps are provided for general guidance purposes only and not as a definitive source for determining critical habitat boundaries.

(a) *Critical habitat boundaries*—(1) *Coastal Marine Areas:* The critical habitat designation for black abalone within each coastal marine area below along the California coast is defined by four latitude and longitude coordinates that set the northern and southern boundaries, as well as by bathymetric specifications that set the shoreward and seaward boundaries. The northern boundary is the straight line between the northern coordinates and the southern boundary is the straight line between the southern coordinates, extending out as far as the seaward boundary, defined by the −6 m depth bathymetry line (relative to mean lower low water (MLLW)), and the shoreward boundary, defined by the line that marks mean higher high water (MHHW). Critical habitat only includes rocky intertidal and subtidal habitats within these areas from the MHHW line to a depth of −6 m relative to MLLW, as well as the marine waters above the rocky habitats.

(i) *Del Mar Landing Ecological Reserve in Sonoma County to Point Bonita in Marin County, California:* northern coordinates: 38°44′25.04″ N, 123°30′52.067″ W and 38°44′25.948″ N, 123°30′19.175″ W; southern coordinates: 37°49′3.404″ N, 122°31′56.339″ W and 37°49′3.082″ N, 122°31′50.549″ W.

(ii) *South of San Francisco Bay in San Francisco County to Natural Bridges State Beach in Santa Cruz County, California:* northern coordinates: 37°47′17.078″ N, 122°31′13.59″ W and 37°47′17.524″ N, 122°30′21.458″ W; southern coordinates: 36°57′11.547″ N, 121°58′36.276″ W and 36°57′15.208″ N, 121°58′31.424″ W.

(iii) *Pacific Grove in Monterey County to Cayucos in San Luis Obispo County, California:* northern coordinates: 36°36′41.16″ N, 121°53′30.453″ W and 36°36′41.616″ N, 121°53′47.763″ W; southern coordinates: 35°26′22.887″ N, 120°54′6.264″ W and 35°26′23.708″ N, 120°53′39.427″ W.

(iv) *Montaña de Oro State Park in San Luis Obispo County, California to just south of Government Point in Santa Barbara County, California:* northern coordinates: 35°17′15.72″ N, 120°53′30.537″ W and 35°17′15.965″ N, 120°52′59.583″ W; southern coordinates: 34°27′12.95″ N, 120°22′10.341″ W and 34°27′25.11″ N, 120°22′3.731″ W.

(v) *Palos Verdes Peninsula extending from the Palos Verdes/Torrance border to Los Angeles Harbor in southwestern Los Angeles County, California:* northern coordinates: 33°48′22.604″ N, 118°24′3.534″ W and 33°48′22.268″ N, 118°23′35.504″ W; southern coordinates: 33°42′10.303″ N, 118°16′50.17″ W and 33°42′25.816″ N, 118°16′41.059″ W.

(2) *Coastal Offshore Islands:* The black abalone critical habitat areas surrounding the coastal offshore islands listed below are defined by a seaward boundary that extends offshore to the −6m depth bathymetry line (relative to MLLW), and a shoreward boundary that is the line marking MHHW. Critical habitat only includes rocky intertidal and subtidal habitats from MHHW to a depth of −6 m relative to MLLW, including the marine waters above the rocky substrate.

(i) *Farallon Islands, San Francisco County, California.*

(ii) *Año Nuevo Island, San Mateo County, California.*

(iii) *San Miguel Island, Santa Barbara County, California.*

(iv) *Santa Rosa Island, Santa Barbara County, California.*

(v) *Santa Cruz Island, Santa Barbara County, California.*

(vi) *Anacapa Island, Ventura County, California.*

(vii) *Santa Barbara Island, Santa Barbara County, California.*

(viii) *Santa Catalina Island, Los Angeles County, California.*

(b) *Primary constituent elements.* The primary constituent elements essential for the conservation of the black abalone are:

(1) *Rocky substrate.* Suitable rocky substrate includes rocky benches formed from consolidated rock of various geological origins (e.g., igneous, metamorphic, and sedimentary) that contain channels with macro- and micro-crevices or large boulders (greater than or equal to 1 m in diameter) and occur from MHHW to a depth of −6 m relative to MLLW. All types of relief (high, medium and low; 0.5 to greater than 2 m vertical relief) support black abalone.

(2) *Food resources.* Abundant food resources including bacterial and diatom films, crustose coralline algae, and a source of detrital macroalgae, are required for growth and survival of all stages of black abalone. The primary macroalgae consumed by juvenile and adult black abalone are giant kelp (*Macrocystis pyrifera)* and feather boa kelp (*Egregia menziesii)* in southern California (i.e., south of Point Conception) habitats, and bull kelp (*Nereocystis leutkeana)* in central and northern California habitats (i.e., north of Santa Cruz), although *Macrocystis* and *Egregia* may be more prominent in the habitat and diet in areas south of Santa Cruz. Southern sea palm (*Eisenia arborea),* elk kelp (*Pelagophycus porra),* stalked kelp (*Pterygophora californica),* and other brown kelps (*Laminaria sp.*) may also be consumed by black abalone.

(3) *Juvenile settlement habitat.* Rocky intertidal and subtidal habitat containing crustose coralline algae and crevices or cryptic biogenic structures (e.g., urchins, mussels, chiton holes, conspecifics, anemones) is important for successful larval recruitment and juvenile growth and survival of black abalone less than approximately 25 mm shell length. Adult abalone may facilitate larval settlement and metamorphosis by grazing down algal competitors and thereby promoting the maintenance of substantial substratum cover by crustose coralline algae, outcompeting encrusting sessile invertebrates (e.g. tube worms and tube snails) for space and thereby promoting the maintenance of substantial substratum cover by crustose coralline algae as well as creating space for settling abalone, and emitting chemical cues that may induce settlement of abalone larvae.

(4) *Suitable water quality.* Suitable water quality includes temperature (i.e., tolerance range: 12 to 25 °C; optimal range: 18 to 22 °C), salinity (i.e., 30 to 35 ppt), pH (i.e., 7.5 to 8.5), and other chemical characteristics necessary for normal settlement, growth, behavior, and viability of black abalone.

(5) *Suitable nearshore circulation patterns.* Suitable circulation patterns are those that retain eggs, sperm, fertilized eggs, and ready-to-settle larvae within 100 km from shore so that successful fertilization and settlement to shallow intertidal habitat can take place.

(c) Overview maps of black abalone critical habitat follow:

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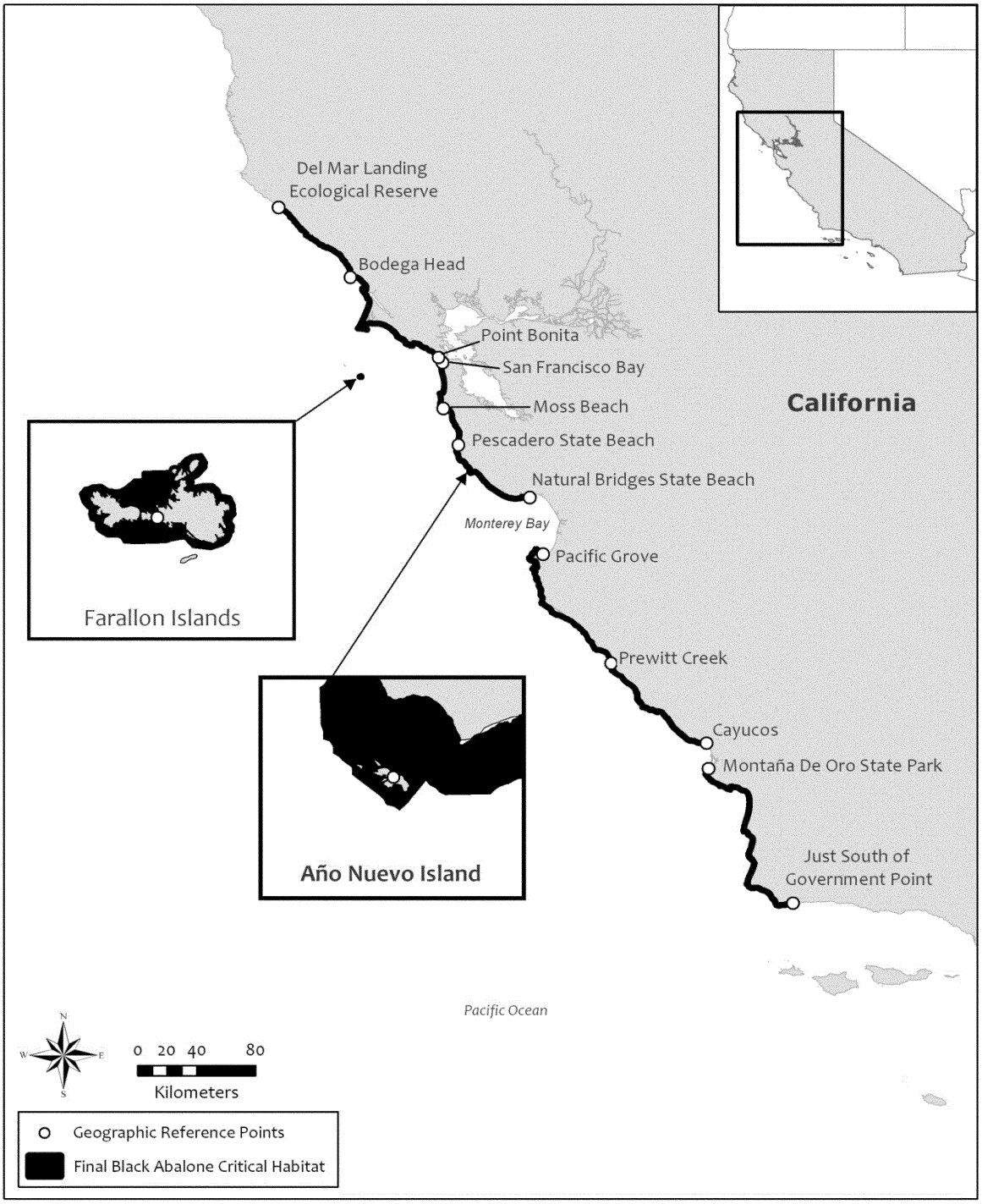
Del Mar Landing
Ecological Reserve
Bodega Head
Point Bonita
San Francisco Bay
Moss Beach
Pescadero State Beach
Natural Bridges State Beach
Monterey Bay
Pacific Grove
Prewitt Creek
Cayucos
Montaña De Oro State Park
Just South of
Government Point
California
Farallon Islands
Año Nuevo Island
Pacific Ocean
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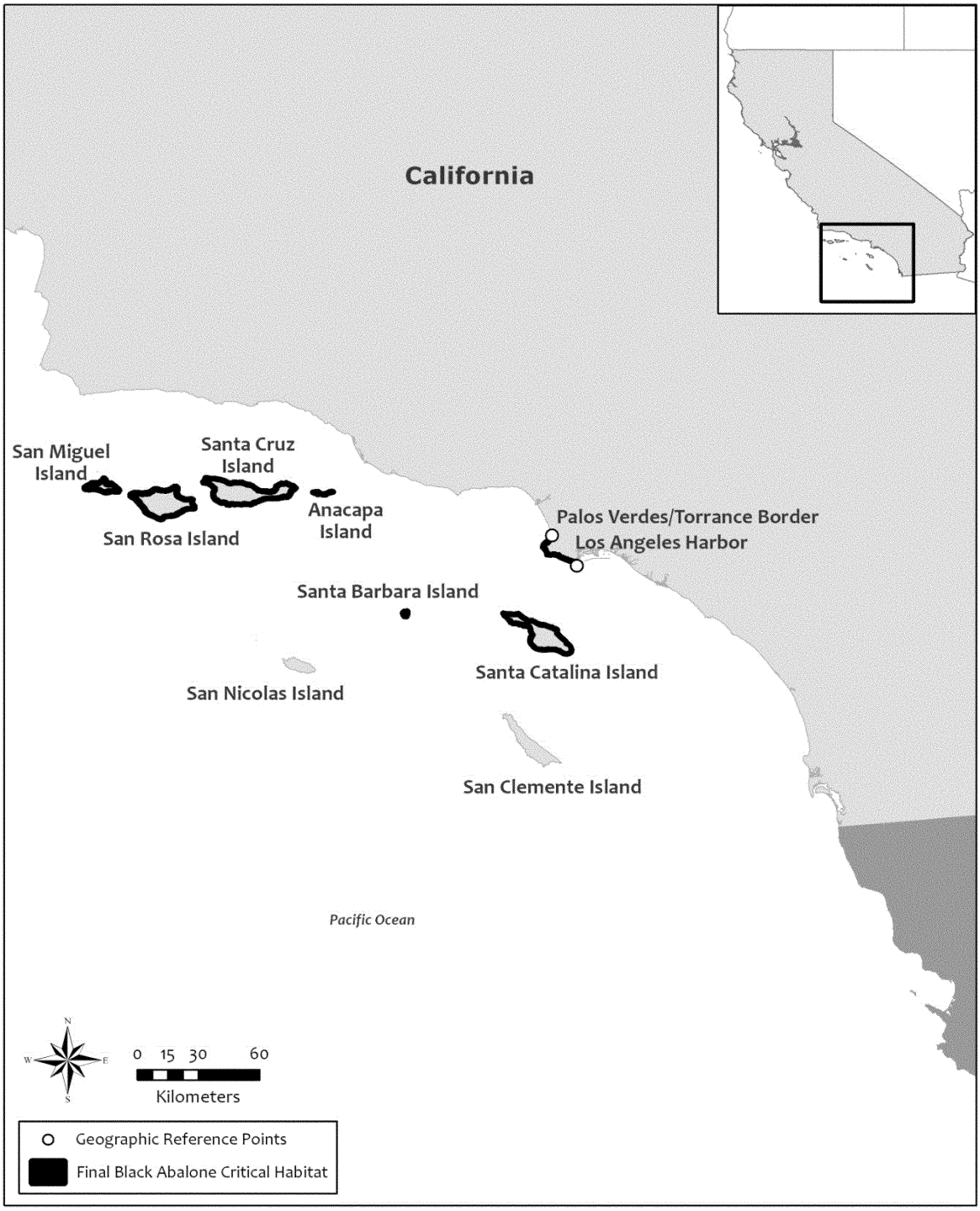
0 20 40 80
Kilometers
Geographic Reference Points
Final Black Abalone Critical Habitat



[FR Doc. 2011–27376 Filed 10–26–11; 8:45 am]
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