Federal Register

Tuesday,
September 28, 2010

Part V

Department of Commerce

National Oceanic and Atmospheric Administration

50 CFR Part 226

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

DEPARTMENT OF COMMERCE

National Oceanic and Atmospheric Administration

50 CFR Part 226

[Docket No. 100127045–0120–01]

RIN 0648–AY62

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

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

ACTION: Proposed rule; request for comments.

SUMMARY: We, the National Marine Fisheries Service (NMFS), propose to designate approximately 390 square kilometers of critical habitat for the endangered black abalone, pursuant to section 4 of the Endangered Species Act (ESA). Specific areas proposed for designation include rocky habitats from the mean higher high water (MHHW) line to a depth of 6 meters (m) within the following areas on the California coast: Del Mar Landing Ecological Reserve to Point Bonita; from the southern point at the mouth of San Francisco Bay to Natural Bridges State Beach; from Pacific Grove to Cayucos; from Montaña de Oro State Park to just south of Government Point; Palos Verdes Peninsula from the Palos Verdes/Torrance border to Los Angeles Harbor; the Farallon Islands; Año Nuevo Island; San Miguel Island; Santa Rosa Island; Santa Cruz Island; Anacapa Island; San Nicolas Island; Santa Barbara Island; Catalina Island; and San Clemente Island. We propose to exclude the following area from designation because the economic benefits of exclusion outweigh the benefits of inclusion, and exclusion will not result in the extinction of the species: rocky habitats within the MHHW line to a depth of 6 m from Corona Del Mar State Beach to Dana Point, California.

DATES: Comments on this proposed rule to designate critical habitat must be received by no later than 5 p.m. Pacific Standard Time on November 29, 2010. A public hearing will be held promptly if any person so requests by November 12, 2010. Notice of the date, location, and time of any such hearing will be published in the **Federal Register** not less than 15 days before the hearing is held.

ADDRESSES: You may submit comments on the proposed rule, identified by RIN 0648–AY62, by any one of the following methods:

- *Electronic Submissions:* Submit all electronic public comments via the Federal eRulemaking Portal: *http://www.regulations.gov.* Follow the instructions for submitting comments.
- *Fax:* 1–562–980–4027, Attention: Melissa Neuman.
- *Mail:* Submit written information to Chief, Protected Resources Division, Southwest Region, National Marine Fisheries Service, 501 West Ocean Blvd, Suite 4200, Long Beach, CA 90802–4213.

Instructions: All comments received are a part of the public record and will generally be posted to *http://www.regulations.gov* without change. All Personal Identifying Information (for example, name, address, etc.) voluntarily submitted by the commenter may be publicly accessible. Do not submit Confidential Business Information or otherwise sensitive or protected information. NMFS will accept anonymous comments (please enter N/A in the required fields if you wish to remain anonymous). Attachments to electronic comments will be accepted in Microsoft Word, Excel, WordPerfect, or PDF file formats only.

Reference materials and supporting documents regarding this proposed designation can be obtained via the Internet at: *http://swr.nmfs.noaa.gov/*, the Federal eRulemaking Portal at: *http://www.regulations.gov*, 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 Marta Nammack, NMFS, Office of Protected Resources (301) 713–1401.

SUPPLEMENTARY INFORMATION:

Background

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). Under the ESA, we are responsible for designating critical habitat for all endangered and threatened species (16 U.S.C. 1533). This rule describes the proposed critical habitat designation, including supporting information on black abalone biology, distribution, and habitat use, and the methods used to develop the proposed designation.

We considered various alternatives to the critical habitat designation for black abalone. The alternative of not designating critical habitat for black abalone would impose no economic, national security, or other relevant impacts, but would not provide any conservation benefit to the species. This alternative was considered and rejected because such an approach does not meet the legal requirements of the ESA and would not provide for the conservation of black abalone. The alternative of designating all of the areas considered for designation (i.e., no areas excluded) was also considered and rejected because, for one area, the economic benefits of exclusion outweighed the benefits of designation, and NMFS did not determine that exclusion of this area would significantly impede conservation of the species or result in extinction of the species. The total estimated annualized economic impact associated with the designation of all of the areas considered would be $595,900 to $158,967,500 (discounted at 7 percent) or $562,600 to $144,410,200 (discounted at 3 percent).

An alternative to designating critical habitat within all of the areas considered for designation is the designation of critical habitat within a subset of these areas. Under section 4(b)(2) of the ESA, NMFS must consider the economic impacts, impacts to national security, and other relevant impacts of designating any particular area as critical habitat. NMFS has the discretion to exclude an area from designation as critical habitat if the benefits of exclusion (i.e., the impacts that would be avoided if an area were excluded from the designation) outweigh the benefits of designation (i.e., the conservation benefits to black abalone if an area were designated), so long as exclusion of the area will not result in extinction of the species. Exclusion under section 4(b)(2) of the ESA of one or more of the areas considered for designation would reduce the total impacts of designation. The determination of which units to exclude depends on NMFS' ESA section 4(b)(2) analysis, which is conducted for each area and described in detail in the draft ESA 4(b)(2) report (NMFS, 2010b). Under the preferred alternative we propose to exclude one of the 20 areas considered. The total estimated economic impact associated with this preferred alternative is $582,500 to $155,851,400 (discounted at 7 percent) or $551,800 to $141,300,500 (discounted at 3 percent). We determined that the exclusion of this one area would not significantly impede the conservation of

black abalone nor result in extinction of the species. We selected this as the preferred alternative because it results in a critical habitat designation that provides for the conservation of black abalone while reducing the economic impacts. This alternative also meets the requirements under the ESA and our joint NMFS–U.S. Fish and Wildlife Service (USFWS) regulations concerning critical habitat.

Black Abalone Natural History

General Description

Black abalone (*Haliotis cracherodii,* Leach, 1814) are shallow-living marine gastropods with smooth, circular, and black to slate blue colored shells that have five to nine open respiratory pores sitting flush with the shell's surface. Typically, the shell's interior is white (Haaker *et al.,* 1986), with a poorly defined or no muscle scar (Howorth, 1978). Adults attain a maximum shell length of approximately 20 cm (throughout this notice we use the maximum diameter of the elliptical shell as the index for individual body size). The muscular foot of the black abalone allows the animal to clamp tightly to rocky surfaces without being dislodged by wave action. Locomotion is accomplished by an undulating motion of the foot. A column of shell muscle attaches the body to the shell. The mantle and black epipodium, a sensory structure and extension of the foot which bears lobed tentacles of the same color (Cox, 1960), circle the foot and extend beyond the shell of a healthy black abalone. The internal organs are arranged around the foot and under the shell.

Historical and Current Distribution

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 (P. Raimondi, pers. comm.).

Population Structure

Recent studies have evaluated population structure in black abalone (Hamm and Burton, 2000; Chambers *et al.,* 2006; Gruenthal and Burton, 2008) using various methods. These studies indicate: (1) Minimal gene flow among populations; (2) black abalone populations are composed predominantly of closely related individuals produced by local spawning events; (3) gene flow among island populations is relatively greater than between island and mainland populations; and (4) the overall connectivity among black abalone populations is low and likely reflects limited larval dispersal and a low degree of exchange among populations.

Habitat

Black abalone generally inhabit coastal and offshore island intertidal habitats on exposed rocky shores where bedrock provides deep, protective crevice shelter (Leighton, 2005). These complex surfaces with cracks and crevices in upper and middle intertidal zones may be crucial recruitment habitat and appear to be important for adult survival as well (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 6 m, with most animals found in middle and lower intertidal zones. In highly exposed locations downwind of large offshore kelp beds, the majority of abalone may be found in the high intertidal where drift kelp fragments, a principal food for black abalone, tend to be concentrated by breaking surf.

Movement

Planktonic larval abalone movement is determined primarily by patterns of water movement in nearshore habitats near spawning sites. Larvae may be able to influence movement to some degree by adjusting their vertical position in the water column, but to our knowledge, the ability of black abalone larvae to move in this way has not been documented. Movement behavior of postmetamorphic juvenile black abalone is likewise unknown. Leighton (1959) and Leighton and Boolootian (1963) indicate that black abalone larvae may settle and metamorphose in the upper intertidal zone, using crevices and depressions (including those formed by abrasive action of other intertidal mollusks) as habitat. Leighton and Boolootian (1963) suggest that young black abalone move lower in the intertidal zone as they begin to grow, occupying the undersides of large boulders. To our knowledge there is no published information on direct observations of movement behavior of the smallest (<20 mm) juvenile black abalone in the field. Qualitative (Leighton, 2005; VanBlaricom, unpublished observations) and quantitative (Bergen, 1971; Blecha *et al.,* 1992; VanBlaricom and Ashworth, in preparation; Richards, unpublished observations) studies of movement in black abalone suggest that smaller abalone (<65 mm) move more frequently than larger abalone, movement is more frequent during night hours compared to daylight hours, and larger abalone may remain in the same location for many years.

Diet

Larvae are lecithotrophic (i.e., receive nourishment via an egg yolk) and apparently do not actively feed during their planktonic life stage. From the time of post-larval metamorphosis to a size of about 20 mm, black abalone are highly cryptic, occurring primarily on the undersides of large boulders or in deep narrow crevices in solid rocky substrata. In such locations the primary food sources are thought to be microbial and possibly diatom films (Leighton, 1959; Leighton and Boolootian, 1963; Bergen, 1971) and crustose coralline algae. At roughly 20 mm black abalone move to more open locations, albeit still relatively cryptic, gaining access to both attached macrophytes and to pieces of drift plants cast into the intertidal zone by waves and currents. As black abalone continue to grow, the most commonly observed feeding method is entrapment of drift plant fragments. Webber and Giese (1969), Bergen (1971), Hines and Pearse (1982), and Douros (1987) have confirmed the importance of large kelps in the diet of juvenile and adult black abalone. The primary food species are said to be 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.

Reproduction

Black abalone reach reproductive maturity between 3 and 7 years (Smith *et al.,* 2003), have separate sexes, and are "broadcast" spawners. Gametes from both parents are shed into the sea, and fertilization is entirely external. Resulting larvae are minute and defenseless, receive no parental care or protection of any kind, and are subject to a broad array of physical and biological sources of mortality. Species with a broadcast-spawning reproductive strategy are subject to strong selection for maximum fecundity of both sexes. Only through production of large numbers of gametes can broadcast spawners overcome high mortality of gametes and larvae and survive across generations. It is not uncommon for broadcast-spawning marine species, a group including many taxa of fish and invertebrates, to produce millions of eggs or sperm per individual per year.

Broadcast spawners are also subject to other kinds of selection for certain traits associated with reproduction, including spatial and temporal synchrony in spawning and mechanisms that increase probabilities for union of spawned gametes.

Spawning Density

As intertidal organisms on exposed rocky shores, black abalone typically release gametes into environments of extreme turbulence. As a consequence, eggs and sperm must be released from adults in relatively close spatial and temporal proximity in order to have any chance of union and fertilization before rapid dispersal and loss of opportunity. A central problem for conservation of black abalone is the dramatic reduction in densities over the past quarter century in almost the entire geographic range of the species. Reductions in density are so extreme and widespread that considerable attention is now focused on assessment of critical density thresholds for successful reproduction, recruitment, and population sustainability. Critical density thresholds, below which recruitment failure occurs, exist across a broad taxonomic range of marine, broadcast-spawning invertebrates (e.g., sea urchins, sea cucumbers, hard clams, scallops, giant clams, and geoduck clams). Neuman *et al.* (in press) reviewed recruitment patterns in three long-term data sets for black abalone in California, and in each case, recruitment failed when declining population densities fell below 0.34 m^{-2}. Densities in most black abalone populations in Southern California have fallen below the densities noted. Recent evidence suggests that disease-induced increases in the mortality rate of black abalone continue to move northward along the mainland coast of California (e.g., Raimondi *et al.,* 2002; Miner *et al.,* 2006). Thus, the number and geographic scope of populations with densities falling below sustainable levels is expected to increase.

Larval Dispersal, Settlement, and Recruitment

Most abalone larvae drift in the water for a period of about 3–10 days before settlement and metamorphosis (e.g., McShane, 1992). During that short period of time, abalone have limited capacity for dispersal over distances beyond a few kilometers. Indirect methods for assessing larval dispersal in abalone support the conclusion that black abalone exhibit limited larval dispersal (Tegner and Butler, 1985; Prince *et al.,* 1988; Hamm and Burton, 2000; Chambers *et al.,* 2005; Chambers *et al.,* 2006; Gruenthal, 2007).

A sequence of studies and discoveries suggests that availability of crustose coralline algae in appropriate intertidal habitats may be an important settlement cue for larval black abalone, and that the presence of adult black abalone may facilitate larval settlement and metamorphosis because the activities and presence of the abalone promote the maintenance of substantial substratum cover by crustose coralline algae (Morse *et al.,* 1979; Morse and Morse, 1984; Douros, 1985; Trapido- Rosenthal and Morse, 1986; Morse, 1990; Morse, 1992; Miner *et al.,* 2006). Although crustose coralline algae are ubiquitous in rocky benthic habitats along the west coast of North America, a mechanistic understanding of processes that sustain these algal populations has not been established, to our knowledge.

Growth and Longevity

Available data on black abalone growth suggest that young animals reach maximum shell diameters of about 2 cm in their first year, then grow at rates of 1–2 cm per year for the next several years. Growth begins to slow at lengths of about 10 cm, corresponding to an age range of 4–8 years. Beyond this point, growth is less predictable, shell erosion may become a significant factor, and size distributions for older animals may vary according to local conditions. Growth and erosion of shells may come into equilibrium in older black abalone, such that growth can be viewed as facultatively determinant. Maximum recorded shell length for black abalone was listed at 213 mm by Wagner and Abbott (1990). Ault (1985) reported a maximum shell length of black abalone at 215 mm. Leighton (2005) indicated a shell length of 216 mm reported by Owen (unpublished observation). Maximum longevity of black abalone is thought to be 20–30 years.

Mortality

The most important source of black abalone mortality is the disease known as withering syndrome (hereafter WS). Disease transmission and manifestation is intensified when local sea surface temperatures increase by as little as 2.5 °C above ambient sea surface temperatures and remain elevated over a prolonged period of time (i.e., a few months or more) (Friedman *et al.,* 1997; Raimondi *et al.,* 2002; Harley and Rogers-Bennett, 2004; Vilchis *et al.,* 2005). WS is caused by a Rickettsiales-like prokaryotic pathogen of unknown origin that invades digestive epithelial cells and disrupts absorption of digested materials from the gut lumen into the tissues (Gardner *et al.,* 1995). Progressive signs of the disease include pedal atrophy, diminished responsiveness to tactile stimuli, discoloration of the epipodium, and a loss of ability to maintain adhesion to rocky substratum (Raimondi *et al.,* 2002). While population-scale mortality rates due to WS may vary in space and time from near zero to high proportions of local populations, the available evidence suggests that the highest disease-induced mortality events have followed periods of elevated sea surface temperature (e.g., Raimondi *et al.,* 2002). Laboratory studies have demonstrated that elevated water temperature, while not a direct cause of WS, accelerates the mortality of black abalone carrying the pathogen that causes the disease (Friedman *et al.,* 1997). A recent study examined the effects of elevated sea surface temperature on abalone at the individual level, and suggested that warming ocean temperatures are likely to have negative consequences on those species associated with cooler water temperatures and/or particularly susceptible to WS (Vilchis *et al.,* 2005). Although there is no explicitly documented causal link between the persistence of WS and long-term climate change, patterns observed over the past 3 decades suggest that progression of ocean warming associated with large-scale climate change may facilitate further and more prolonged vulnerability of black abalone to the effects of WS. The preponderance of evidence indicates that WS continues to damage the size and sustainability of black abalone populations on a large scale, with little plausible basis for any predictions of reversal except in localized, spatially isolated cases.

Factors such as poaching, reduced genetic diversity, ocean acidification, non-anthropogenic predation (e.g., by octopuses, lobsters, sea stars, fishes, sea otters, and shorebirds) and competition (e.g., with sea urchins), food limitation, environmental pollutants and toxins, and substrate destruction may all impose mortality on black abalone at varying rates, but predicting the relative impacts of each of these factors on the long-term viability of black abalone is difficult without further study. In addition to the aforementioned present-day sources of mortality, commercial and recreational fisheries operating in California until 1993 likely contributed to the species' decline. For more information on historic and present-day factors leading to the decline of black abalone populations, please see 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).

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 proposed rule is based on the best scientific 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 critical habitat review team (CHRT), comprised of seven Federal biologists from NMFS, the National Park Service (NPS), US Geological Survey (USGS), Minerals Management Service (hereafter MMS; MMS has been renamed the Bureau of Ocean Energy Management, Regulation, and Enforcement, or BOEMRE, as of June 18, 2010), and the Monterey Bay National Marine Sanctuary 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. The CHRT's evaluation and conclusions are described in detail in the following sections, as well as in the draft biological report (NMFS, 2010c).

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 mean higher high water (MHHW) to a depth of 6 m. 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. Most black abalone occupy the middle and lower intertidal zones. In highly exposed locations downwind of large offshore kelp beds, the majority of abalone may be found in the high intertidal where drift kelp fragments tend to be concentrated by breaking surf. 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 599.3 miles (964.5 km) or 70 percent of it falls within the areas considered in this proposed 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). 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 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), and the pesticide oxadiazon was found to severely reduce algal growth (Silver and Riley, 2001). We are not aware of additional information regarding processes that mediate crustose coralline algae abundance and solicit the public for more information on this topic.

(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 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 south of Monterey County, CA and the Farallon Islands (J. Moore, pers. comm.). 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 severely reduce algal growth (Silver and Riley, 2001). We are not aware of other studies that have established direct and indirect links between currently used pesticides and effects on black abalone habitat quality and solicit the public for more information on this topic. 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) Disrupting an abalone's ability to maintain and grow its protective shell; and/or (2) reducing abundance of coralline algae (and associated diatom films and bacteria), a calcifying organism that may mediate 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). Given that black abalone gamete and larval durations are relatively short, larvae have little control over their position in the water column, and ready-to-settle larvae require shallow, intertidal habitat for settlement. 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. 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.,* in press) 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, 2010c). Within this geographically occupied area, black abalone typically inhabit coastal and offshore island rocky intertidal habitats from MHHW to depths of 6 m (Leighton, 2005). The CHRT then identified "specific areas" within the geographical area occupied by the species that may be eligible for critical habitat designation 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 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 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 draft biological report (NMFS, 2010c; 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 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 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 the draft economic report (NMFS, 2010a).

Activities that exacerbate global climate change (most notably fossil fuel combustion, which contributes to an increase in atmospheric CO_2 levels and subsequent sea level rise, sea surface temperature elevation, and ocean acidification) were identified as a concern for all of the specific areas. The Black Abalone Proposed Critical Habitat Designation maps below, as well as the draft biological report (NMFS, 2010c), show the location of each specific area considered for designation.

Specific Area 1. Specific Area 1 includes the rocky intertidal habitat from the Del Mar Landing Ecological Reserve to Bodega Head in Sonoma County, California. 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. Based on the limited historical data available for this area (Geiger 2003, State Water Resources Control Board 1979, J. Sones pers. comm.), 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) 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; J. Sones pers. comm.), and 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 (Water Quality Control Board, 1979) 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, 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 higher densities and multiple size classes of black abalone in the future if habitat changes (e.g., sea surface temperature rise) render it more suitable for promoting population growth. Thus, the CHRT scored the conservation value of this area as "High."

Specific Area 2. Specific Area 2 includes rocky intertidal habitat from Bodega Head in Sonoma County, California, to Point Bonita in Marin County, California. 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. Historical presence of black abalone within this area is limited, but in locations where black abalone were observed, they were considered rare (Light, 1941; Chan, 1980; S. Allen, pers. comm.). 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 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, but as with Specific Area 1 above, the area is at the limit of the species' northern range, which may explain its rarity. 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 at 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 higher densities and multiple size classes of black abalone in the future if habitat changes (e.g., sea surface temperature rise) render it more suitable for promoting population growth. Thus, the CHRT scored the conservation value of this area as "High."

Specific Area 3. Specific Area 3 includes the rocky intertidal habitat surrounding the Farallon Islands, San Francisco County, California. 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 National Marine Sanctuary. Historical presence of black abalone in intertidal habitats surrounding the Farallon Islands was noted in the late 1970s (Farallones Research Group, 1979) and again in the early 1990s (E. Ueber, unpublished data). Black abalone have been observed in Specific Area 3 during limited surveys conducted during the past 5 years, and 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, and activities that exacerbate global climate change. The CHRT scored the conservation value of this area as "High."

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, California, and includes all rocky intertidal habitat within this area. 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, Point Reyes National Seashore and Golden Gate National Recreation Area 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, J. Sones, pers. comm..; M. Wilson, pers. comm.). 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. The CHRT scored the conservation value of this area as "Medium."

Specific Area 5. Specific Area 5 includes rocky intertidal habitat from Moss Beach to Pescadero State Beach, San Mateo County, California. 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. 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 recognized that all of the PCEs were present in the area and their current quality ranged from poor to good. 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 because the area has not been adequately studied. Since the species was listed in 2009, only one survey has been conducted by Reyes National Seashore and Golden Gate National Recreation Area researchers. One black abalone was identified during this survey. 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. The CHRT scored the conservation value of this area as "Medium," recognizing that it 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.

Specific Area 6. Specific Area 6 includes the rocky intertidal habitat surrounding Año Nuevo Island, San Mateo County, California. The island lies 50 miles (74 km) south of San Francisco Bay and, two hundred 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 University of California Santa Cruz's 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. 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). To our knowledge, the island has not been surveyed for black abalone since that time. 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 only concern identified within this specific area. The CHRT scored the conservation value of this area as "High."

Specific Area 7. Specific Area 7 includes the rocky intertidal habitat from Pescadero State Beach, San Mateo County, California, to Natural Bridges State Beach, Santa Cruz County, California. 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*). 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 (Water Quality Control Board, 1979; J. Pearse, pers. comm.) and rare at the majority of sites (Water Quality Control Board, 1979; J. Pearse, pers. comm.). PISCO 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 within the last 5 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, 2010c) 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, 2010c). 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, sidecasting (i.e., the piling of excavated dirt on the edge of a ditch or elsewhere in a wetland or other water body because of road maintenance), agricultural pesticide application and irrigation, oil and chemical spills and clean-up, construction and operation of desalination plants, vessel grounding, non-native species introduction and management, kelp harvesting, and activities that exacerbate global climate change. The CHRT scored the conservation value of this area as "High."

Specific Area 8. Specific Area 8 includes rocky intertidal habitats from Pacific Grove to Prewitt Creek, Monterey County, California. 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*). In order to keep the size of this area comparable to other specific areas, Prewitt Creek was chosen to delineate its southern boundary. 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 (Water Quality Control Board, 1979; Raimondi *et al.,* 2002; Tissot, 2007). More recent information gathered within the last 5 years by PISCO 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, 2010c for details). The CHRT scored the conservation value of this area as "High."

Specific Area 9. Specific Area 9 includes rocky intertidal habitats from Prewitt Creek, Monterey County, California to Cayucos, San Luis Obispo County, California. 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. PISCO and the University of California Santa Cruz (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 (Water Quality Control Board, 1979; 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, 2010c 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. The CHRT scored the conservation value of this area as "High."

Specific Area 10. Specific Area 10 includes rocky intertidal habitats from Montaña de Oro State Park in San Luis Obispo County, California, to just south of Government Point, Santa Barbara County, California. 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. 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). PISCO and UCSC established long-term monitoring sites within this area between 1992 and 2007, and, within the last 5 years, 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. The CHRT scored the conservation value of this area as "High."

Specific Area 11. Specific Area 11 includes rocky intertidal habitats surrounding the Palos Verdes Peninsula and extends from the Palos Verdes/Torrance border to Los Angeles Harbor in southwestern Los Angeles County, California. 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. Long-term intertidal monitoring on the Peninsula conducted by the California State University Long Beach (CSULB) and the Cabrillo Marine Aquarium 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, which led to the CHRT's conclusion that this area is of "Medium" conservation value. 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 been observed, 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 (LACSD, 1997). 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; J. Kalman and B. Allen, pers. comm.). However, because many of the habitat features important to black abalone are still present and are in fair to excellent condition, the CHRT scored the conservation value of this area as "Medium." 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 habitats from Corona Del Mar State Beach to Dana Point in Orange County, California. The limited extent of rocky intertidal habitat is what defines the northern and southern boundaries of this specific area. Historical information for this area indicates that black abalone were present along this stretch of coastline, and limited abundance information suggests densities of <1 per m^2 (Tissot, 2007; S. Murray, pers. comm.) 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 University of California Fullerton began monitoring four sites within this area in 1996, and no black abalone have been observed at these locations within the last 5 years. 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. 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 within the last five years.

Specific Areas 13–16. Specific Areas 13–16 include the rocky intertidal habitat surrounding the Northern California Channel Islands: San Miguel, Santa Rosa, and Santa Cruz islands in Santa Barbara County, California, and Anacapa Island in Ventura County, California. The Northern Channel Islands lay 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 Channel Islands National Marine Sanctuary 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. Historically, black abalone were present and common at 76 percent of the sampling locations within these specific areas (Water Quality Control Board, 1979; Water Quality Control Board, 1982; Water Quality Control Board, 1982; B. Douros, pers. comm.; CINP, pers. comm.; Tissot, 2007). Severe population declines began in 1986 and by the 1990s declines in abundance of >99 percent were observed at all of the CINP sampling sites. Within the last 5 years, abundance at most locations remains depressed; however, at a small number of sites abundance has increased and repeated recruitment events have occurred. These 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, agricultural pesticide application and irrigation on Anacapa Island; and kelp harvesting and activities that exacerbate global warming. The CHRT recognized that, although these areas are currently lacking multiple size classes of black abalone, there is evidence of small-scale recovery at a few locations, and, therefore, these areas received "High" conservation value scores.

Specific Areas 17–20. Specific Areas 17–20 include the rocky intertidal habitat surrounding the Southern California Channel Islands: San Nicolas Island in Ventura County, CA, Santa Barbara Island in Santa Barbara County, CA, and Santa Catalina and San Clemente islands in Los Angeles County, California. 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 part of the CINP and the Channel Islands National Marine Sanctuary 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.

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, 2009). Within the last 5 years, 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; VanBlaricom, 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, which led the CHRT to score this area as one of "High" conservation value. 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.

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. Within the last 5 years 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. However, given the lack of evidence of recruitment both historically and currently and very low numbers of juveniles and adults, the CHRT scored the conservation value of this area as "Medium." 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 fossil fuel combustion.

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 PISCO University of California Los Angeles group established two long-term sampling sites in 1982 and 1995, and, 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. The CHRT scored the conservation value of this area as "High," despite uncertainty in the demographic history and current status of populations on Catalina, because the habitat is in good condition and could support black abalone populations in the future. 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.

San Clemente Island was surveyed by the California Department of Fish and Game 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 1 per m^2 by 1993 (CDFG, 1993). The Department of Defense 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 > 100 mm) were identified and all but two of the animals were solitary individuals (Tierra Data Inc., 2008). 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. Thus, the CHRT deemed this area as being of "High" conservation value.

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 and improve the quality of black abalone PCEs. These activities are described briefly in the following paragraphs and Table 1. These activities are documented more fully in the draft biological report (NMFS, 2010c) and draft economic report (NMFS, 2010a), which provide a description of the potential effects of each category of activities on the PCEs.

The major categories of habitat-related activities 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) National Pollutant Discharge Elimination System (NPDES) activities and activities generating non-point source pollution; (7) sidecasting activities (e.g., the piling of excavated dirt on the edge of a ditch or elsewhere in a wetland or other water body because of road maintenance); (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 groundings; (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 draft Biological Report (NMFS 2010a) and draft Economic Analysis Report (NMFS 2010b) 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, sidecasting, mineral and petroleum

exploration and extraction, and sand replenishment may result in increased sedimentation, erosion, turbidity, or scouring in rocky intertidal 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	Unknown. We solicit the public for more information (see "Public Comments Solicited").	*Rocky substrate* PCE—Dredging that does occur near rocky intertidal 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. *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.	The U.S. Army Corps of Engineers (USACE) issues permits pursuant to Section 404 of the Clean Water Act (CWA), among several others. The USACE must then consult with NMFS under section 7 of the ESA.	Restrictions on the spatial and temporal extent of dredging activities and the deposition of dredge spoil. Requirements to treat (detoxify) dredge spoil.
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. *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.	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 unertaken by private or non-Federal parties, in most cases they must obtain a USACE permit. The USACE must then consult with NMFS under section 7 of the ESA.	Bank stabilization measures and more natural erosion control.

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Activity	Specific areas	PCE and nature of the threat	Section 7 nexus	Possible modification(s) to the activity
		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.
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. *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.	Issuance of CWA permits. State water quality standards are subject to an ESA section 7 consultation between NOAA and the EPA and NOAA can review individual NPDES permit applications for impacts on ESA-listed species.	Where Federal permits are necessary, ensure discharge meets standards other than existing federal standards and regulations (EPA, CWA). Require measures to prevent or respond to a catastrophic event (i.e., using best technology to avoid unnecessary discharges).

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Activity	Specific areas	PCE and nature of the threat	Section 7 nexus	Possible modification(s) to the activity
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. For example, in a study on San Nicolas Island, black abalone "dominated areas where rock contours provided a refuge from sand deposition" (Littler *et al.,* 1983, cited in Airoldi, 2003). Overall, there has been little study of the effects of increased sedimentation on rocky shoreline communities (Airoldi, 2003). In addition, construction of coastal armoring is often associated with coastal urban development to protect structures from wave action or prevent erosion (see "in-water construction" in Section 2.1). *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 (see 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.
Sidecasting	7 and 8	*Rocky substrate and settlement habitat* PCEs—Increased likelihood of sediment input into rocky intertidal habitats may reduce its quality and quantity. *Food resources* PCE—Sidecasting 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 Monterey Bay National Marine Sanctuary (MBNMS) to allow for a prohibited activity.	Haul away (or store locally) excess material from road maintenance activities, rather than sidecast; place excess material at a stable site at a safe distance from rocky intertidal habitats; and use mulch or vegetation to stabilize the material.

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Activity	Specific areas	PCE and nature of the threat	Section 7 nexus	Possible modification(s) to the activity
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. *Food resources* PCE—Herbicides are designed to kill plants, thus herbicide contamination of water could have devastating effects on aquatic plants. *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.	*Irrigation*—any water supplier providing water via contract with U.S. Bureau of Reclamation (USBR) or using infrastructure owned or maintained by the USBR is subject to section 7 consultation under ESA. Privately owned diversions may require a Federal permit from USACE under sections 401 or 404 of the CWA. *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. *Livestock farming*—Bureau of Land Management (BLM) and the U.S. Forest Service (USFS).	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. For pesticides application: restrictions on application of some pesticides within certain distances of streams. 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 & clean-up.	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.	Restrict or minimize the use or type of response to oil spills (e.g. boom, dispersants, *in situ* burning) in areas where black abalone habitat exists. Mitigation measures include adoption of oil/chemical spill clean-up protocols and oil/chemical spill prevention plans, more Clean Seas boats as first responders to prevent oil/chemical spills from coming onshore, and relocation of proposed oil/chemical platforms further away from black abalone habitats.
Vessel grounding	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.

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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 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 the withering syndrome disease.	The Diablo Canyon Nuclear Power Plant, located in specific area 10, is licensed through the Nuclear Regulatory Commission.	Require cooling of thermal effluent before release to the environment (may require use of different technology). Require treatment of any contaminated waste materials. Modifications associated with permit issued under NPDES (any updates from current early 1990s issuance). Dry cooling systems (not as feasible as wet cooling systems due to greater logistical constraints and total costs). Modifications to cooling water intake flow by season and operational conditions using variable speed pumps/variable frequency drives (benefits depend on the frequency and degree that flow can be reduced without affecting operations). Use of reclaimed water as a source of makeup water for wet cooling towers or as a source for once-through cooling water systems.
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.

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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 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.
Construction and operation of liquefied natural gas (LNG) projects.	Unknown ..... We solicit the public for more information (see "Public Comments Solicited").	*Rocky substrate* PCE—Onshore LNG terminals, construction of breakwaters, jetties, or other shoreline structures and 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.	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.

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Activity	Specific areas	PCE and nature of the threat	Section 7 nexus	Possible modification(s) to the activity
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.	The Mineral Management Service (MMS) 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. *Settlement habitat* PCE—Non-native species may displace native organisms by preying on them or out-competing 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. Other possible consequences of non-native species introductions could be impacts on flow patterns, sediment and nutrient dynamics, and impacts on native bio-engineering 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. For aquaculture: inspect aquaculture facilities to prevent non-native species transport in packing materials.
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.

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Activity	Specific areas	PCE and nature of the threat	Section 7 nexus	Possible modification(s) to the activity
Activities leading to global climate change (e.g., fossil fuel combustion).	1–20	Affects all PCEs. There is little information on these effects, however. We solicit the public for more information (see "Public Comments Solicited"). *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).	Uncertain	Uncertain.

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 in the past 5 years. 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 (J. DeMartini, pers. comm.). 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, 1979).

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. Therefore, the three presently unoccupied areas were not considered in further analyses. We solicit comments 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.

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 on San Clemente Island and San Nicolas Island are covered by INRMPs that are currently being revised to address black abalone conservation. If these INRMPs are finalized and determined to provide benefits to black abalone, as described under section 4(a)(3)(B) of the ESA, then the areas would be ineligible for designation and a determination on whether the areas warrant exclusion under section 4(b)(2) of the ESA based on national security impacts would no longer be necessary.

Application of ESA Section 4(b)(2)

Section 4(b)(2) of the ESA requires the 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. 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 propose to 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 consider the conservation value of the different areas when balancing conservation benefits of designation against economic benefits of exclusion. Delineating particular areas based on impacts on national security or other relevant impact should be 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 request information on other relevant impacts that should be considered (see "Public Comments Solicited"). 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 outweigh the benefits of designation. These steps and the resulting list of areas proposed for exclusion from designation are described in detail in the sections below.

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 ensure 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) contains the overlapping requirement that Federal agencies must also ensure 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 ensure their actions are not likely to 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 adverse modification prohibition, beyond the changes predicted to occur as a result of listing and the jeopardy provision. Following a line of recent court decisions, in particular, *Cape Hatteras Access Preservation Alliance* v. *Norton,* 344 F. Supp. 2d 1080 (D.D.C. 2004)) (*Cape Hatteras*) we analyzed the impact of this proposed regulation based on a comparison of the world with and without the action. Consistent with the *Cape Hatteras* decision, we focus on the potential incremental impacts beyond the impacts that would result from the listing and jeopardy provision. In some instances, however, it was difficult to exclude potential impacts that may already occur under the baseline (i.e., protections already afforded black abalone under its listing or under other Federal, State, and local regulations). Many uncertainties exist with regard to future management actions that may be required due to black abalone critical habitat because of the short consultation history for black abalone and overlap with protections provided under the listing and other existing regulations. Thus, the analysis included some impacts that would have occurred under the baseline regardless of the critical habitat designation. As such, the consideration of impacts cannot be characterized as exclusively incremental impacts of the critical habitat designation (*New Mexico Cattle Growers Association* v. *U.S. Fish and Wildlife Service,* 248 F.3d 1277 (10th Cir. 2001)) (NMCA). Instead, the impacts of the designation are more correctly characterized as black abalone impacts.

Once we determined the impacts of the designation, we then determined the benefits of designation and the benefits of exclusion based on the impacts of the designation. The benefits of designation include the conservation impacts for black abalone and its habitat that result from the critical habitat designation and the application of ESA section 7(a)(2). The benefits of exclusion include the economic impacts, impacts on national security, and other relevant impacts (e.g., impacts on Indian lands) of the designation 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, as required

under section 4(b)(2) of the ESA, to identify particular areas that may be eligible for exclusion from the designation. We also summarize the results of this weighing process and determinations on the areas that may be eligible for exclusion.

Benefits of Designation

The primary benefit of designation is the protection afforded under section 7 of the ESA, requiring all Federal agencies to ensure their actions are not likely to destroy or adversely modify designated critical habitat. This is in addition to the requirement that all Federal agencies ensure 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 indicated that species with critical habitat were 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 were 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 conducting 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 draft Biological Report (NMFS 2010a) provides detailed information on the CHRT's biological analysis and evaluation of each specific area.

Benefits of Exclusion Based on Economic Impacts and Proposed 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* 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 changes beyond those that may be required under the jeopardy provision. Because of the limited consultation history, we relied on information from other section 7 consultations and the CHRT's expertise to determine the types of activities and potential range of changes. For each potential impact, we tried to provide information on whether the impact is more closely associated with adverse modification or with jeopardy, to distinguish the impacts of applying the jeopardy provision versus the 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 a section 7 consultation) and sustain an economic impact. It is only those activities with a federal nexus that would sustain an economic impact as a result of the designation. Within the set of activities identified in the *Special Management Considerations and Protections* 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 draft economic report 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 activities and activities generating non-point source pollution; (6) sidecasting; (7) oil and chemical spills and clean-up activities; (8) power generation operations involving water withdrawal from and discharge to marine coastal waters; (9) construction and operation of alternative energy hydrokinetic projects (tidal or wave energy projects); and (10) construction and operation of desalination plants. 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; vessel groundings; 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 draft economic report (NMFS, 2010a) 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 mean annualized economic impact estimates (discounted at 7%; see draft economic report (NMFS 2010a) for additional details) for each specific area. To develop the economic impact ratings, we examined the mean annualized economic impacts (discounted at 7 percent) across all of the specific areas. We then divided the economic impacts into four economic impact rating categories corresponding to "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) economic impact ratings. The four economic impact rating categories were determined by visually inspecting the economic impact values and identifying natural breakpoints in the economic impacts data where the estimated economic impacts experienced a large increase. We then compared these economic impact ratings (representing the benefits of exclusion) with the conservation value ratings (representing the benefits of designation) and applied the following decision rules to identify areas eligible for exclusion based on economic impacts: (1) Areas with a conservation value rating of "High" were eligible for exclusion if the mean annualized economic impact estimate exceeded $10 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 mean annualized economic impact estimate exceeded $500,000 (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 mean annualized economic impact estimate exceeded $100,000 (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. Under the ESA, we are to weigh dissimilar impacts given limited time and information. The statute emphasizes that the decision to exclude is discretionary. Thus, the level at which the economic benefits of exclusion outweigh the conservation benefits of designation is a matter of discretion and depends on the policy context. 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. In this policy context, we developed decision rules with dollar thresholds representing the levels at which we believe the economic benefit of exclusion associated with a specific area could outweigh the conservation benefits of designation. These dollar thresholds and decision rules provided a relatively simple process to identify, in a limited amount of time, specific areas warranting consideration for exclusion based on economic impacts.

Based on this analysis, two areas were identified preliminarily as eligible for exclusion. These areas were: (1) Specific area 10, from Montaña de Oro State Park to just south of Government Point; and (2) specific area 12, from Corona Del Mar State Beach to Dana Point. We presented the two areas to the CHRT to help us further characterize the benefits of designation by determining whether excluding any of these areas 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 all of the areas eligible for exclusion as well as the information they had developed in providing the conservation value ratings. If the CHRT determined that exclusion of an 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. 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. The high estimated economic impact for this area was primarily due to impacts associated with construction and operation of a proposed desalination plant, which made up about 93% of the mean annualized economic impact estimate of $1,563,500 for this area. The estimated economic impacts to the desalination plant were based on the costs for using alternate methods of brine disposal (i.e., injection wells).

The CHRT determined, and we concur, that exclusion of specific area 10 (from Montaña de Oro State Park to just south of Government Point) would significantly impede conservation of black abalone. The CHRT gave the area a "High" conservation value in their biological evaluation. Historically, black abalone were considered common at several sites within the area. The populations have since suffered declines due to WS, but continue to persist at several sites. Although the habitat has changed since the decline in abalone (e.g., sea urchins and encrusting invertebrates have moved in to some crevice habitats), the habitat remains of high quality. The CHRT also emphasized the importance of this area in maintaining connectivity between black abalone populations on the north-central California coast and the southern California coast. Therefore, the CHRT determined, and we concur, that the conservation value of this area should be raised by one level (i.e., from High to Very High). In addition, the estimated economic impact for this area is likely

overestimated. The very high economic impact estimate for this area was primarily due to costs associated with the Diablo Canyon Nuclear Power Plant (DCNPP), which made up about 46 percent of the low annualized economic impact estimate and 99 percent of the mean and high annualized economic impact estimate for the area (see NMFS, 2010a for details). These estimated costs were based on the costs required to retrofit the DCNPP with a closed cooling system. However, there are less costly actions that we could not monetize that could be taken to avoid or minimize effects on black abalone habitat, such as restoring habitat in other areas around the DCNPP and conducting biological monitoring of black abalone and its habitat. Thus, the economic benefits of exclusion were not determined to outweigh the conservation benefits of designation for specific area 12 for the following reasons: (a) The area has a Very High conservation value to black abalone and exclusion of this area would significantly impede conservation of the species; and (b) the very high economic impacts are likely overestimated. We solicit comments from the public regarding the estimate of economic impacts to the DCNPP, the effects of the DCNPP on black abalone and its habitat, and the potential modifications that may be required to address these effects (including the feasibility and estimated costs of such modifications; see "Public Comments Solicited"). If information obtained during the public comment period suggests that the very high economic impact estimate for retrofitting the DCNPP is a realistic impact of the designation, we will re-examine our analysis regarding this area and consider other approaches that may allow exclusion of a particular area within this specific area.

In summary, we propose to exclude 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 impede the conservation of black abalone, nor will it result in the extinction of the species.

Benefits of Exclusion Based on National Security and Proposed 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).

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 (NMFS, 2010b). Thus, these areas were not included in further analyses. The NALF San Clemente Island and OLF San Nicolas Island do occur within the specific areas being considered for designation and were analyzed for potential exclusion under section 4(b)(2) of the ESA.

The Navy did not provide information about the activities occurring within the OLF San Nicolas Island, but did provide information regarding activities conducted within the NALF San Clemente Island that may be affected by the designation of critical habitat for black abalone. An overview of these activities is provided in the draft ESA section 4(b)(2) report (NMFS, 2010b). More specific information is needed regarding which of the Navy activities may affect black abalone habitat (i.e., rocky intertidal habitat within MHHW to a depth of 6 m), how these activities may be affected by the critical habitat designation, and how these effects may result in impacts on national security. We request additional information from the Navy identifying and describing in detail the activities that may occur in or that may affect the areas being considered for designation (i.e., rocky habitat) and thus trigger consultation under section 7 of the ESA. This information is necessary to assess whether the areas warrant exclusion from the designation based on national security impacts.

At this time, we do not propose to exclude the NALF San Clemente Island or OLF San Nicolas Island from the designation based on national security impacts but will continue to coordinate with the Navy to assess the potential national security impacts. Additional information is also solicited from the public regarding the potential national security impacts of this designation (see "Public Comments Solicited"). After assessing any additional information provided by the DOD as well as by the public, a final determination will be made in the final critical habitat designation. The Navy's facilities on San Clemente Island and San Nicolas Island are covered by INRMPs that are currently being revised to address black abalone conservation. If these INRMPs are finalized and determined to provide benefits to black abalone, as described under section 4(a)(3)(B) of the ESA, then the areas would be ineligible for designation and a determination on whether the areas warrant exclusion under section 4(b)(2) of the ESA based on national security impacts would no longer be necessary. The response summarized above was transmitted to the Navy via a letter from NMFS dated July 9, 2010.

Benefits of Exclusion for Indian Lands and Proposed Exclusions

The only other relevant impacts of the designation identified were potential impacts on Indian lands. The benefits of exclusion for Indian lands are the impacts on Indian lands that would be avoided if particular areas were excluded from the designation. A broad array of activities on Indian lands may trigger ESA section 7 consultations and be affected by the designation of critical habitat. The longstanding and distinctive relationship between the Federal and tribal governments is defined by treaties, statutes, executive orders, judicial decisions, and agreements, which differentiate tribal governments from the other entities that deal with, or are affected by, the Federal government. This relationship has given rise to a special Federal trust responsibility involving the legal responsibilities and obligations of the United States toward Indian Tribes and the application of fiduciary standards of due care with respect to Indian lands, tribal trust resources, and the exercise of tribal rights. Pursuant to these authorities, lands have been retained by Indian Tribes or have been set aside for tribal use. These lands are managed by Indian Tribes in accordance with tribal goals and objectives within the framework of applicable treaties and laws. E.O. 13175 (Consultation and Coordination with Indian Tribal Governments) outlines the responsibilities of the Federal Government in matters affecting tribal interests.

For this proposed critical habitat designation for black abalone, we reviewed maps indicating that none of the specific areas under consideration for designation as critical habitat

overlap with Indian lands. Therefore, no areas were considered for exclusion based on impacts on Indian lands. We solicit information from the public regarding any Indian lands that may overlap with and may warrant exclusion from critical habitat for black abalone (see "Public Comments Solicited"). Indian lands are those defined in the Secretarial Order "American Indian Tribal Rights, Federal-Tribal Trust Responsibilities, and the Endangered Species Act" (June 5, 1997) and include: (1) Lands held in trust by the United States for the benefit of any Indian tribe; (2) land held in trust by the United States for any Indian Tribe or individual subject to restrictions by the United States against alienation; (3) fee lands, either within or outside the reservation boundaries, owned by the tribal government; and (4) fee lands within the reservation boundaries owned by individual Indians. Should any Indian lands be identified within the specific areas considered and proposed for designation as black abalone critical habitat, they will be considered for exclusion under section 4(b)(2) of the ESA if the tribe or tribes request exclusion (see "Public Comments Solicited").

Critical Habitat Designation

This rule proposes to designate approximately 390 square kilometers of habitat in California within the geographical area presently occupied by black abalone. 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 proposes to exclude 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 proposing any unoccupied areas for designation 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 proposed critical habitat designation offshore is defined by the 6 m depth bathymetry contour relative to the line of mean lower low water (MLLW) 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 outside of the proposed 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 proposed 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 once finalized are: (1) Coastal development; (2) in-water construction; (3) sand replenishment or beach nourishment activities; (4) agricultural activities (e.g., irrigation); (5) NPDES activities and activities generating non-point source pollution; (6) 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, Federal funding is received, or the entity is involved in or receives benefits from a Federal project. 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 draft economic report (NMFS, 2010a) 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**).

Public Comments Solicited

To ensure the final action resulting from this proposal will be as accurate and as effective as possible, we solicit comments and suggestions from the public, other concerned governments and agencies, the scientific community, industry, or any other interested party concerning this proposed rule. Specifically, public comments are sought concerning: (1) The role that ocean acidification plays in reducing growth and survivorship of abalone as has been observed in other marine gastropods (Shirayama and Thornton, 2005); (2) the impact that reduced abundance of coralline algae resulting from increased partial pressure of carbon dioxide (hereafter CO_2) (Feely *et al.,* 2004; Hall-Spencer *et al.,* 2008) has on the survival of newly settled black abalone; (3) the effects that environmental pollutants have on growth, reproduction, and survival of black abalone at varying spatial scales, as has been demonstrated in a few, locally isolated cases (e.g., Diablo Canyon-Martin *et al.,* 1977; Palos Verdes Peninsula-Leighton, 1959; Cox, 1962; Young, 1964; Miller and Lawrenz-Miller, 1993); (4) the impacts that accidentally spilled oil from offshore drilling platforms or various types of commercial vessels and subsequent clean-up operations have on the quality of black abalone habitat; (5) information describing the abundance, distribution, and habitat use of black abalone throughout its current and historical range; (6) information on the identification, location, and quality of physical or biological features which may be essential to the conservation of black abalone; (7) information regarding potential impacts of designating any particular area, including the types of Federal activities that may trigger an ESA section 7 consultation and the possible modifications that may be required of those activities as a result of section 7 consultation; (8) information regarding the benefits of designating any particular area of the proposed critical habitat; (9) information regarding the benefits of excluding particular areas from the critical habitat designation; (10) current or planned activities in the areas proposed for designation and their possible impacts on proposed critical habitat; and (11) any foreseeable economic, national security, tribal, or other relevant impacts resulting from the proposed designations. With regard to Indian lands, we request that the following information be provided to inform our ESA section 4(b)(2) analysis: (1) A map and description of the Indian lands (e.g., location, latitude and longitude coordinates to define the boundaries, extent into waterways); (2) a description of tribal activities that may be affected within the area; (3) a description of past, ongoing, or future conservation measures conducted by the tribes that may protect black abalone habitat within the area; and (4) a point of contact.

We encourage comments on this proposal. You may submit your comments and materials by any one of several methods (see **ADDRESSES**). The proposed rule, maps, references, and other materials relating to this proposal can be found on our Web site at *http://swr.nmfs.noaa.gov,* on the Federal eRulemaking Portal at *http://www.regulations.gov,* or can be made available upon request. We will consider all comments and information received during the comment period for this proposed rule in preparing the final rule.

Public Hearings

Regulations at 50 CFR 424.16(c)(3) require the Secretary to promptly hold at least one public hearing if any person requests one within 45 days of publication of a proposed rule to designate critical habitat. Requests for a public hearing must be made in writing (see **ADDRESSES**) by November 12, 2010. If a public hearing is requested, a notice detailing the specific hearing location and time will be published in the **Federal Register** at least 15 days before the hearing is to be held. Information on specific hearing locations and times will also be posted on our Web site at *http://swr.nmfs.noaa.gov.* These hearings provide the opportunity for interested individuals and parties to give comments, exchange information and opinions, and engage in a constructive dialogue concerning this proposed rule. We encourage the public's involvement in such ESA matters.

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 draft biological report and draft economic analysis report supporting this rule proposing to designate critical habitat for the black abalone are considered influential scientific information and subject to peer review. These two reports will each be distributed to three independent peer reviewers for review on or before the publication date of this proposed rule. The peer reviewer comments will be compiled into a peer review report to be made available to the public at the time the black abalone critical habitat designation is finalized.

Required Determinations

Regulatory Planning and Review (E.O. 12866)

This proposed rule has been determined to be significant for purposes of E.O. 12866. A draft 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 draft economic analysis report and ESA section 4(b)(2) report are available on the Southwest Region Web site at *http://swr.nmfs.noaa.gov,* 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 an initial regulatory flexibility analysis (IRFA), which is part of the draft economic analysis report (NMFS, 2010a). 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 IRFA did not consider all types of small businesses that could be affected by the black abalone critical habitat designation due to lack of information. Impacts to small businesses involved in 10 activities were considered: (1) In-water construction; (2) dredging; (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) oil and chemical spills and clean-up; (7) construction and operation of power plants; (8) construction and operation of tidal and wave energy projects; (9) construction and operation of liquefied natural gas (LNG) projects; and (10) mineral and petroleum exploration and extraction. The IRFA 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.

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 of 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 is determined based on the results presented in the draft economic report (NMFS, 2010a); (2) the proportion of businesses that are small is calculated for every area for every activity type; (3) the impact to small businesses for every area and activity type is estimated by multiplying the total impacts estimated for all businesses with the proportion of businesses that are determined to be small; and (4) the average impact per small businesses is estimated by taking the ratio of the total estimated impacts to the total number of small businesses.

There is a maximum of 3,671 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 10 (Montaña de Oro State Park to just south of Government Point) with potential costs as high as $75 million. This is mainly due to the impacts on the three facilities that are associated with power plants, which are estimated to be 97.5 percent of the total costs. It is important to note here that these costs area likely overestimated, due to the fact that the modification costs for power plants are based solely on the closed cooling system retrofit. Specific areas 3 (Farallon Islands), 4 (southern point at the mouth of San Francisco Bay to Moss Beach), and 2 (Bodega Head to Point Bonita) have potential annualized small business impacts of about $614,850, $407,050, and $325,300, respectively (NMFS, 2010a).

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); however, in one case, 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. This alternative helps to reduce the number of small businesses potentially affected from 3,671 to 3,193; however, the total potential annualized economic impact to small businesses ($76,858,250; NMFS, 2010a) remains largely unchanged because the estimated annualized cost borne by small entities associated with specific area 12 was very low ($27,200; NMFS, 2010a) and only accounts for 0.04 percent of the total small business impacts.

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 draft economic analysis report. The results of the analysis are summarized here, and more detail is provided in the NMFS draft economic report (NMFS, 2010a).

The Office of Management and Budget 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. Future management and required project modifications for black abalone critical habitat related to power plants include: cooling of thermal effluent before release to the environment, treatment of any contaminated waste materials, retrofitting to a wet cooling system, and modifications associated with permits issued under NPDES. These modifications could affect energy production; however, the potential impact of possible black abalone conservation efforts on the project's energy production and the associated cost is unknown. DCNPP has a production capacity of 2,200 megawatts and therefore, if about half of this capacity is affected by black abalone critical habitat, it would be higher than the 500 megawatts of installed capacity threshold. It is unlikely that any project modifications would have a large impact on the amount of electricity produced. 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. Without information about the effect of power plants on future electricity prices and more specific information about how recommended conservation measures for black abalone would affect electricity production, this analysis is unable to forecast potential energy impacts resulting from changes to power plants.

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 the Federal Energy Regulatory Commission (FERC).[1] 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 price 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 proposed 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

[1] 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.

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 proposed 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 proposed 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 proposed 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 proposed 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 proposed rule would not have significant Federalism effects and that a Federalism assessment is not required. In keeping with Department of Commerce policies, we request information from, and will coordinate development of this proposed critical habitat designation with, appropriate state resource agencies in California. 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 proposed 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 proposing to designate critical habitat in accordance with the provisions of the ESA. This proposed 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 proposed rule does not contain new or revised information collections that require approval by the Office of Management and Budget (OMB) under the Paperwork Reduction Act. This proposed 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 proposed 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 will be submitted for review by the California Coastal Commission.

Government-to-Government Relationship With Tribes

The longstanding and distinctive relationship between the Federal and tribal governments is defined by treaties, statutes, executive orders, judicial decisions, and agreements, which differentiate tribal governments from the other entities that deal with, or are affected by, the Federal government. This relationship has given rise to a special Federal trust responsibility involving the legal responsibilities and obligations of the United States toward Indian Tribes and the application of fiduciary standards of due care with respect to Indian lands, tribal trust resources, and the exercise of tribal rights. Pursuant to these authorities lands have been retained by Indian Tribes or have been set aside for tribal use. These lands are managed by Indian Tribes in accordance with tribal goals and objectives within the framework of applicable treaties and laws. E.O. 13175, Consultation and Coordination with Indian Tribal Governments, outlines the responsibilities of the Federal Government in matters affecting tribal interests. There is a broad array of activities on Indian lands that may trigger ESA section 7 consultations. As described in the section above titled "Exclusions Based on Impacts on Indian Lands," we have not identified any tribal lands that overlap with the proposed 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.*

List of Subjects in 50 CFR Part 226

Endangered and threatened species.

Dated: September 20, 2010.

Eric C. Schwaab,

Assistant Administrator for Fisheries, National Marine Fisheries Service.

For the reasons set out in the preamble, this proposed rule proposes to amend part 226, title 50 of the Code

of Federal Regulations 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 § 226.220, to read as follows:

§ 226.220 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:* Each coastal marine area below is defined by four latitude and longitude coordinates that set the northern, southern, seaward and shoreward boundaries for the critical habitat designation for black abalone in U.S. coastal marine waters. The northern boundary is the straight line between the northern seaward and shoreward coordinates and the southern boundary is the straight line between the southern seaward and shoreward coordinates. The seaward boundary extends offshore to the 6 m depth bathymetry line (relative to mean lower low water) between the northern seaward and southern seaward coordinates and the shoreward boundary is the line that marks mean higher high water between the northern shoreward and southern shoreward coordinates. Critical habitat only includes rocky intertidal habitats to a depth of 6 m.

(i) *Del Mar Landing Ecological Reserve to Bodega Head, Sonoma County, California:* northern seaward coordinates: 38°44′25.04″ N, 123°30′52.067″ W; northern shoreward coordinates: 38°44′25.948″ N, 123°30′19.175″ W; southern seaward coordinates: 38°18′38.623″ N, 123°4′21.549″ W; southern shoreward coordinates: 38°18′39.478″ N, 123°4′7.573″ W.

(ii) *Bodega Head, Sonoma County, California to Point Bonita, Marin County, California:* northern seaward coordinates: 38°18′38.623″ N, 123°4′21.549″ W; northern shoreward coordinates: 38°18′39.478″ N, 123°4′7.573″ W; southern seaward coordinates: 37°49′3.404″ N, 122°31′56.339″ W; southern shoreward coordinates: 37°49′3.082″ N, 122°31′50.549″ W.

(iii) *South of San Francisco Bay to Moss Beach, San Mateo County, California:* northern seaward coordinates: 37°47′17.078″ N, 122°31′13.59″ W; northern shoreward coordinates: 37°47′17.524″ N, 122°30′21.458″ W; southern seaward coordinates: 37°30′11.763″ N, 122°30′35.06″ W; southern shoreward coordinates: 37°30′12.815″ N, 122°30′2.083″ W.

(iv) *Moss Beach to Pescadero State Beach, San Mateo County, California:* northern seaward coordinates: 37°30′11.763″ N, 122°30′35.06″ W; northern shoreward coordinates: 37°30′12.815″ N, 122°30′2.083″ W; southern seaward coordinates: 37°16′42.635″ N, 122°24′52.453″ W; southern shoreward coordinates: 37°16′45.728″ N, 122°24′32.42″ W.

(v) *Just north of Pescadero State Beach, San Mateo County, California to Natural Bridges State Beach, Santa Cruz County, California:* northern seaward coordinates: 37°16′42.635″ N, 122°24′52.453″ W; northern shoreward coordinates: 37°16′45.728″ N, 122°24′32.42″ W; southern seaward coordinates: 36°57′11.547″ N, 121°58′36.276″ W; southern shoreward coordinates: 36°57′15.208″ N, 121°58′31.424″ W.

(vi) *Pacific Grove to Prewitt Creek, Monterey County, California:* northern seaward coordinates: 36°36′41.16″ N, 121°53′30.453″ W; northern shoreward coordinates: 36°36′41.616″ N, 121°53′47.763″ W; southern seaward coordinates: 35°56′5.324″ N, 121°28′45.131″ W; southern shoreward coordinates: 35°56′6.025″ N, 121°28′34.36″ W.

(vii) *Prewitt Creek, Monterey County, California to Cayucos, San Luis Obispo County, California:* northern seaward coordinates: 35°56′5.324″ N, 121°28′45.131″ W; northern shoreward coordinates: 35°56′6.025″ N, 121°28′34.36″ W; southern seaward coordinates: 35°26′22.887″ N, 120°54′6.264″ W; southern shoreward coordinates: 35°26′23.708″ N, 120°53′39.427″ W.

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

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

(2) *Coastal Islands:* The black abalone critical habitat areas surrounding the coastal islands listed below are defined by a seaward boundary that extends offshore to the 6m depth bathymetry line (relative to mean lower low water), and a shoreward boundary that is the line marking mean higher high water. Critical habitat only includes rocky intertidal habitats to a depth of 6 m.

(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) *San Nicolas Island, Ventura County, California.*

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

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

(x) *San Clemente 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 mean higher high water (MHHW) to a depth of 6 m. 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). 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 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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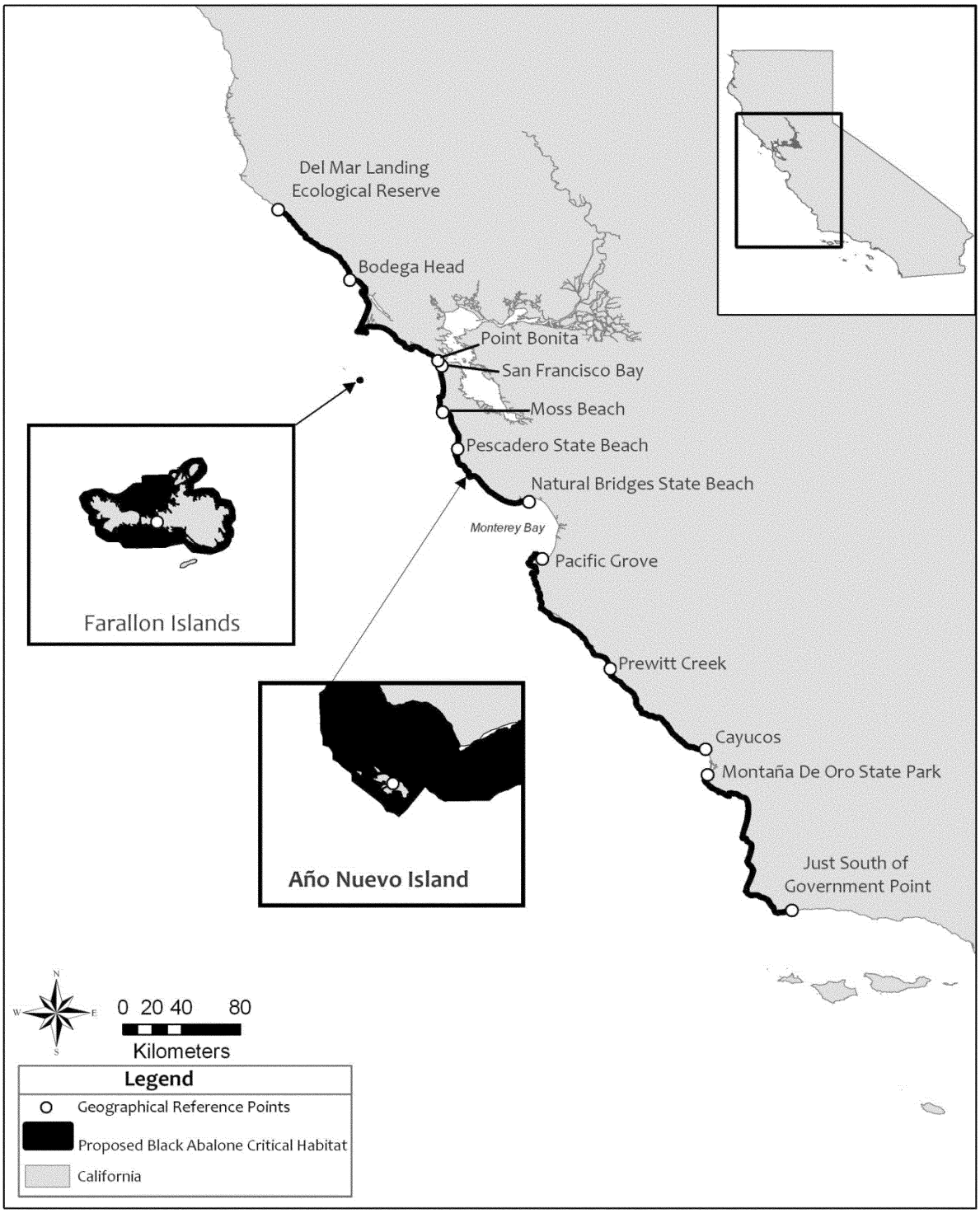
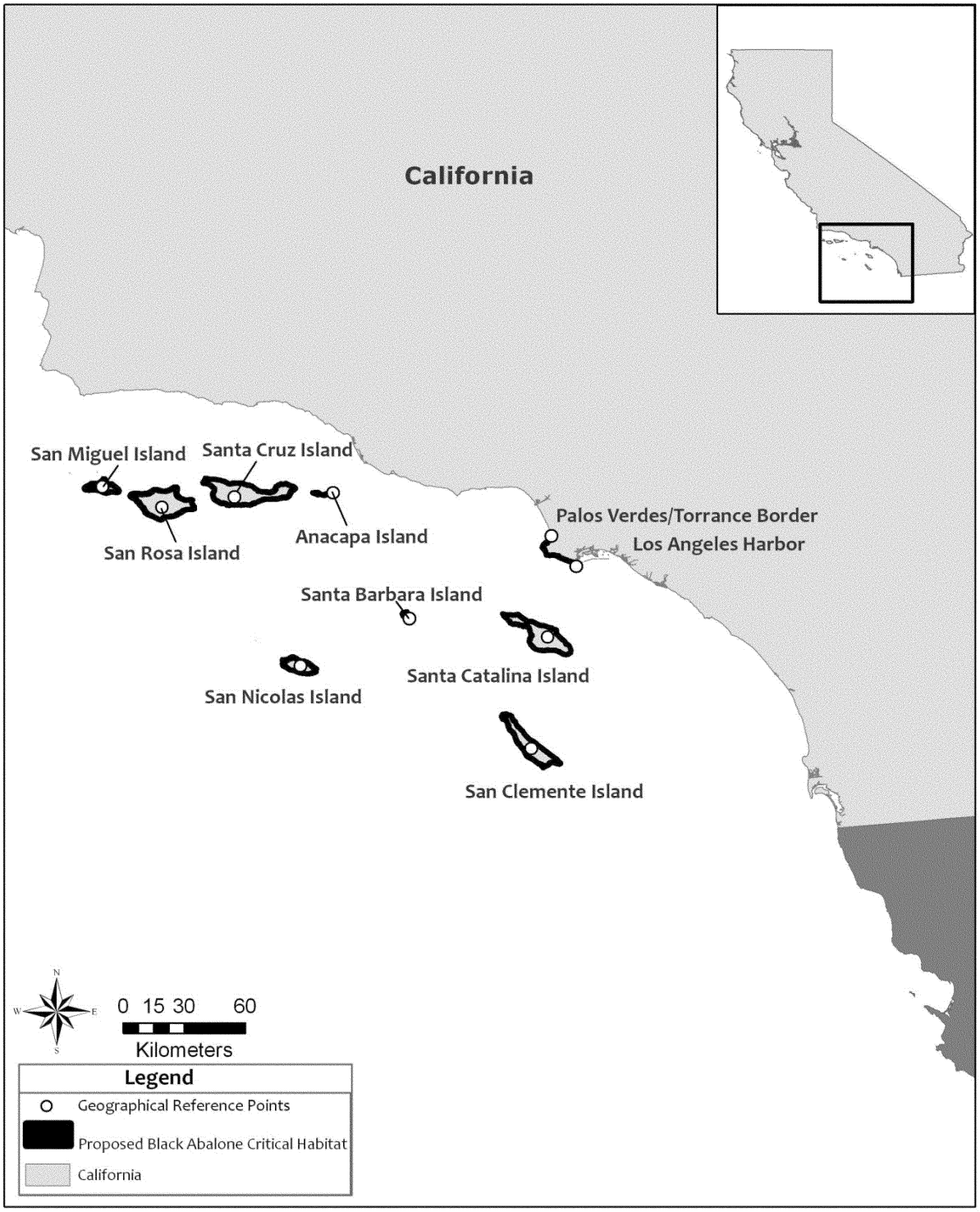
Proposed Black Abalone Critical Habitat
Specific Areas 1-10



Proposed Black Abalone Critical Habitat
Specific Areas 11-20



[FR Doc. 2010–24215 Filed 9–27–10; 8:45 am]
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