

National Park Service  
U.S. Department of the Interior

Point Reyes National Seashore  
California



# Draft Environmental Impact Statement Drakes Bay Oyster Company Special Use Permit



September 2011



**Draft Environmental Impact Statement for the Drakes Bay Oyster Company Special Use Permit  
Point Reyes National Seashore  
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Lead Agency: National Park Service (NPS), U.S. Department of the Interior

Cooperating Agencies: California Department of Fish and Game (CDFG), U.S. Army Corps of Engineers (USACE), National Oceanic and Atmospheric Administration, National Marine Fisheries Service (NOAA-NMFS), and U.S. Environmental Protection Agency (EPA)

This Draft Environmental Impact Statement (EIS) for the Drakes Bay Oyster Company (DBOC) Special Use Permit (SUP) describes and analyzes four alternatives for federal action related to the operation of DBOC within Point Reyes National Seashore (the Seashore). On October 30, 2009, Congress enacted Section 124 of Public Law (PL) 111-88, which provides to the Secretary of the Interior (Secretary) the discretionary authority to issue a new SUP to DBOC for a period of 10 years. Based on the intent of PL 94-544, PL 94-567, and NPS wilderness management policies, the Solicitor's Office opinion advised NPS that it lacked authority to extend DBOC's nonconforming commercial use beyond November 2012. The commercial shellfish operation in Drakes Estero, now operated by DBOC, is the only nonconforming use that prevents conversion of the waters of Drakes Estero from congressionally designated potential wilderness to congressionally designated wilderness. The discretionary authority contained in section 124 now allows the Secretary to permit DBOC's operations for a new 10 year term, until November 30, 2022. The EIS presents a no-action alternative, which considers expiration of existing authorizations and subsequent conversion of the area to congressionally designated wilderness, and three action alternatives, which consider the issuance of a new SUP to DBOC for a period of 10 years with differing levels of onshore facilities and infrastructure and offshore operations.

**Alternative A, No New Special Use Permit – Conversion to Wilderness (No-action)** considers the expiration of the existing RUO and SUP and subsequent conversion to wilderness consistent with PL 94-567. The existing SUP and RUO would expire on November 30, 2012. Under Alternative A, the Secretary would not exercise the discretion granted to him under section 124 to issue a new 10-year SUP. Upon removal of the nonconforming structures from Drakes Estero, NPS would convert the area to wilderness. The three action alternatives describe differing levels of onshore facilities and infrastructure and offshore operations associated with the issuance of a new SUP for a period of 10 years. **Alternative B, Issue New Special Use Permit - Existing Onshore Facilities and Infrastructure and Offshore Operations Would be Allowed for a Period of 10 Years**, considers a level of use consistent with conditions that were present in fall 2010 when NPS initiated evaluation under the EIS. The existing SUP and RUO expire on November 30, 2012. The Secretary would exercise the discretion granted to him under section 124 to issue a new 10-year SUP to DBOC, expiring November 30, 2022. **Alternative C, Issue New Special Use Permit - Onshore Facilities and Infrastructure and Offshore Operations Present in 2008 Would be Allowed for a Period of 10 Years**, considers a level of use that is consistent with the conditions and operations that existed at the time the current SUP was signed in April 2008. The existing SUP and RUO expire on November 30, 2012. Under Alternative C, the Secretary would exercise the discretion granted to him under section 124 to issue a new 10-year SUP to DBOC, expiring November 30, 2022. **Alternative D, Issue New Special Use Permit - Expanded Onshore Development and Offshore Operations Would be Allowed for a Period of 10 Years**, considers expansion of operations and development of new infrastructure as requested by DBOC as part of the EIS process. The existing SUP and RUO expire on November 30, 2012. Under alternative D, the Secretary would exercise the discretion granted to him under section 124 to issue a new 10-year SUP to DBOC, expiring November 30, 2022.

The review period for the Draft EIS will end 60 days after publication of the U.S. Environmental Protection Agency Notice of Availability in the Federal Register. If you wish to comment on the document during the review period, you may submit comments electronically at <<http://parkplanning.nps.gov/pore>> or you may mail comments to the name and address listed below. Email comments will not be accepted. Before including your address, phone number, email address, or other personal identifying information in your comment, you should be aware that your entire comment - including your personal identifying information - may be made publicly available at any time. Although you can ask us in your comment to withhold your personal identifying information from public review, we cannot guarantee that we will be able to do so. After public review, this document may then be revised in response to public comments. A final version of this document will then be released, and a 30-day no-action period will follow. Following the 30-day period, the alternative or actions constituting the approved plan will be documented in a record of decision that will be signed by the Regional Director of the Pacific West Region.

For further information regarding this document, please contact:

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# EXECUTIVE SUMMARY

The Environmental Impact Statement (EIS) for the Drakes Bay Oyster Company (DBOC) Special Use Permit (SUP) examines four alternatives. The no-action alternative considers expiration of existing authorizations and subsequent conversion of the area to congressionally designated wilderness. Three action alternatives consider the issuance of a new SUP to DBOC for a period of 10 years with differing levels of onshore facilities and infrastructure and offshore operations. Beneficial and adverse impacts are assessed for all four alternatives evaluated in this EIS. Existing authorizations for DBOC to operate expire November 30, 2012. The results of the National Environmental Policy Act of 1969, as amended (NEPA) process will be used to inform the decision of whether a new SUP should be issued. If a new SUP is issued, it would allow DBOC to operate until November 30, 2022. In the event that a new SUP is issued, it would incorporate all of DBOC's National Park Service (NPS) authorized onshore and offshore<sup>1</sup> operational requirements.

## PURPOSE OF AND NEED FOR ACTION

### PURPOSE AND NEED

Action is needed at this time because pursuant to section 124 of Public Law 111-88, the Secretary has the discretionary authority to issue a SUP for a period of 10 years to DBOC for its shellfish operation, which consists of commercial production, harvesting, processing, and sale of shellfish at Point Reyes National Seashore. The existing Reservation of Use and Occupancy (RUO) and SUP held by DBOC will expire on November 30, 2012. DBOC has submitted a request for the issuance of a new permit upon expiration of the existing authorizations.

The purpose of the document is to use the NEPA process to engage the public and evaluate the effects of issuing a SUP for the commercial shellfish operation. The results of the NEPA process will be used to inform the decision of whether a new SUP should be issued to DBOC for a period of 10 years.

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<sup>1</sup> In this document, the term offshore is used to refer to operations and facilities in Drakes Estero, including intertidal areas such as the shoreline and mudflats.

## PROJECT OBJECTIVES

- Manage natural and cultural resources to support their protection, restoration, and preservation.
- Manage wilderness and potential wilderness areas to preserve the character and qualities for which they were designated.
- Provide opportunities for visitor use and enjoyment of park resources.

## BACKGROUND

The authority for NPS to issue a new permit to DBOC came about as a result of congressional action. On October 30, 2009, Congress enacted section 124 of Public Law (PL) 111-88 (section 124), which was part of the Department of the Interior, Environment, and Related Agencies Appropriations Act of 2010. Section 124, as it will be referred to in this EIS, provides to the Secretary of the Interior (Secretary) the discretionary authority to issue a new SUP to DBOC that would be valid for a period of 10 years. Congress granted the Secretary the discretionary authority contained in section 124 in response to NPS's determination that it lacked authority to allow DBOC to operate after November 30, 2012. NPS's determination was based on a 2004 opinion from the Department of the Interior (DOI) Solicitor's Office (Solicitor's Office) interpreting PL 94-544 and 94-567 of 1976, which designated Drakes Estero as potential wilderness, and NPS wilderness management policies (DOI 2004<sup>i</sup>). In particular, House Report 94-1680, which accompanied the public law, provided that, "it is the intention that those lands and waters designated as potential wilderness additions will be essentially managed as wilderness, to the extent possible, with efforts to steadily continue to remove all obstacles to the eventual conversion of these lands and waters to wilderness status." The commercial shellfish operation in Drakes Estero, now operated by DBOC, is the only nonconforming use that prevents conversion of the waters of Drakes Estero from congressionally designated potential wilderness to congressionally designated wilderness. Based on the intent of PL 94-544, PL 94-567, and NPS wilderness management policies, the Solicitor's Office opinion advised NPS that it lacked authority to extend DBOC's nonconforming commercial use beyond November 2012 (DOI 2004<sup>ii</sup>). The discretionary authority contained in section 124 now allows the Secretary to permit DBOC's operations for a new 10 year term, until November 30, 2022.

Mariculture entrepreneurs first planted oyster beds in the Tomales Bay area around the turn of the 20th century. The original Drakes Bay Oyster Company (no relation to the present day DBOC) operated on the banks of Drakes Estero near the head of Schooner Bay, from 1938 to 1945 (Caywood and Hagen 2011). In 1958, Charles W. Johnson took over the oyster operation in Drakes Estero and soon founded the Johnson Oyster Company (JOC). Mr. Johnson cultivated shellfish (mostly oysters) in Drakes Estero and operated onshore processing facilities from 1961 through 2003. Mr. Johnson purchased 5 acres of onshore land where the existing processing facilities were located in 1961. He and his wife moved to the oyster plant at Creamery Bay.

Although the Seashore was established in 1962, NPS did not acquire ownership of all lands and waters within the Seashore's boundary immediately. In 1965, the state-held water bottoms of Drakes Estero were conveyed to NPS by the State of California. In 1972, NPS purchased fee title to the 5-acre upland parcel where the oyster processing facilities were located from Mr. Johnson. As part of the purchase agreement, Mr. Johnson elected to retain a 40-year RUO over 1.5 acres of the 5-acre parcel. The RUO allowed for "processing and selling



wholesale and retail oysters, seafood and complimentary food items, the interpretation of oyster cultivation to the visiting public, and residential purposes reasonably incidental thereto.”

In December 2004, DBOC purchased the assets of JOC, assuming the remaining 7 years of the RUO and SUP that NPS had issued to JOC for the well and septic leach field. There were no changes to the terms of the RUO or to its expiration date. In April 2008, DBOC and NPS signed an SUP (NPS Permit No. MISC-8530-6000-8002) that would allow the oyster operation in Drakes Estero to remain, with provisions, until November 30, 2012, when it would expire concurrently with the RUO.

DBOC’s operations occur on uplands adjacent to Drakes Estero and within Drakes Estero itself. All of the upland, tidal, and subtidal lands on which DBOC conducts its operations are located within the Seashore and are owned in fee by the United States. Pursuant to 36 CFR Section 1.2, these lands and activities conducted on them are subject to NPS laws and regulations.

## DESCRIPTION OF THE PROJECT AREA

The Seashore is located in western Marin County in central California, approximately 40 miles northwest of San Francisco and within 50 miles of the nine-county San Francisco Bay Area, the fifth largest metropolitan area in the United States. The Seashore is bounded to the north, west, and southwest by the Pacific Ocean and to the east by the residential communities of Inverness, Inverness Park, Point Reyes Station, Olema, and Dogtown. Western Marin County is primarily rural, with scattered, small, unincorporated towns that serve tourism, agriculture, local residents. In addition, the Seashore administers the Northern District of the Golden Gate National Recreation Area, adjacent to the Seashore, for a combined management area and legislated boundary of approximately 94,000 acres (figure ES-1).

Drakes Estero is a system of five branching bays encompassing approximately 2,500 acres. The branching bays are stretched to the north and separated by low converging ridges. From west to east, they are: Barries Bay, Creamery Bay, Schooner Bay, Home Bay, and Estero de Limantour (figures ES-1 and ES-2). Nearly half of the surface area of Drakes Estero consists of mud and sand flats that are exposed at low tide (Press 2005). Because of the shallow character of the bay, and its tendency to flush completely within a normal tidal cycle, currents in the mainstem and secondary channels are relatively strong. The Drakes Estero watershed covers approximately 31 square miles, including Drakes Estero itself (Baltan 2006). The Seashore leases most of the lands surrounding Drakes Estero for cattle grazing (approximately 14 square miles within the watershed). Areas draining to, and surrounding the Estero de Limantour are primarily within congressionally designated wilderness (approximately 8 square miles within the watershed).

The EIS examines DBOC operations and facilities in and adjacent to Drakes Estero. The project area is roughly 1,700 acres and includes DBOC facilities and operations in much of the congressionally designated potential wilderness (1,363 acres), 2.6 acres of onshore property, and 2 acres incorporating the well and septic areas, as delineated in the RUP and SUP (figures ES-3 and ES-4). In order to provide a comprehensive analysis of potential impacts of the alternatives presented in the EIS, the project area also includes the kayak launch parking area and the access road leading from Sir Francis Drake Boulevard. All land and water portions of the project area are owned by NPS. Resources outside the project area may be described if they are subject to impacts resulting from any of the proposed alternatives. The project area as a whole is depicted on figure ES-2, with figure ES-3 showing the detailed location of the onshore operations.



## Drakes Bay Oyster Company Special Use Permit Environmental Impact Statement

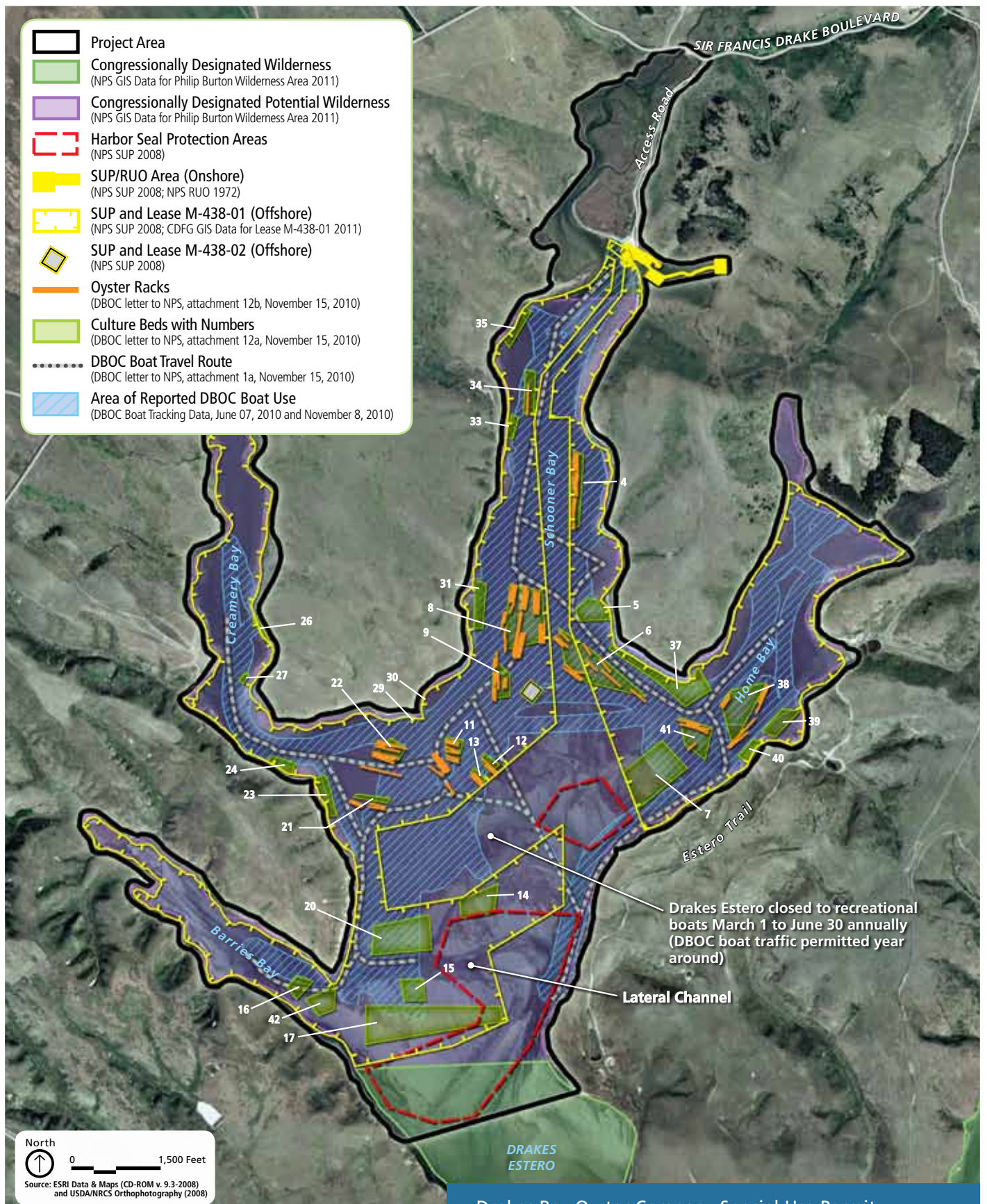
**FIGURE ES-1**  
**Project Location Map**



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## Drakes Bay Oyster Company Special Use Permit Environmental Impact Statement

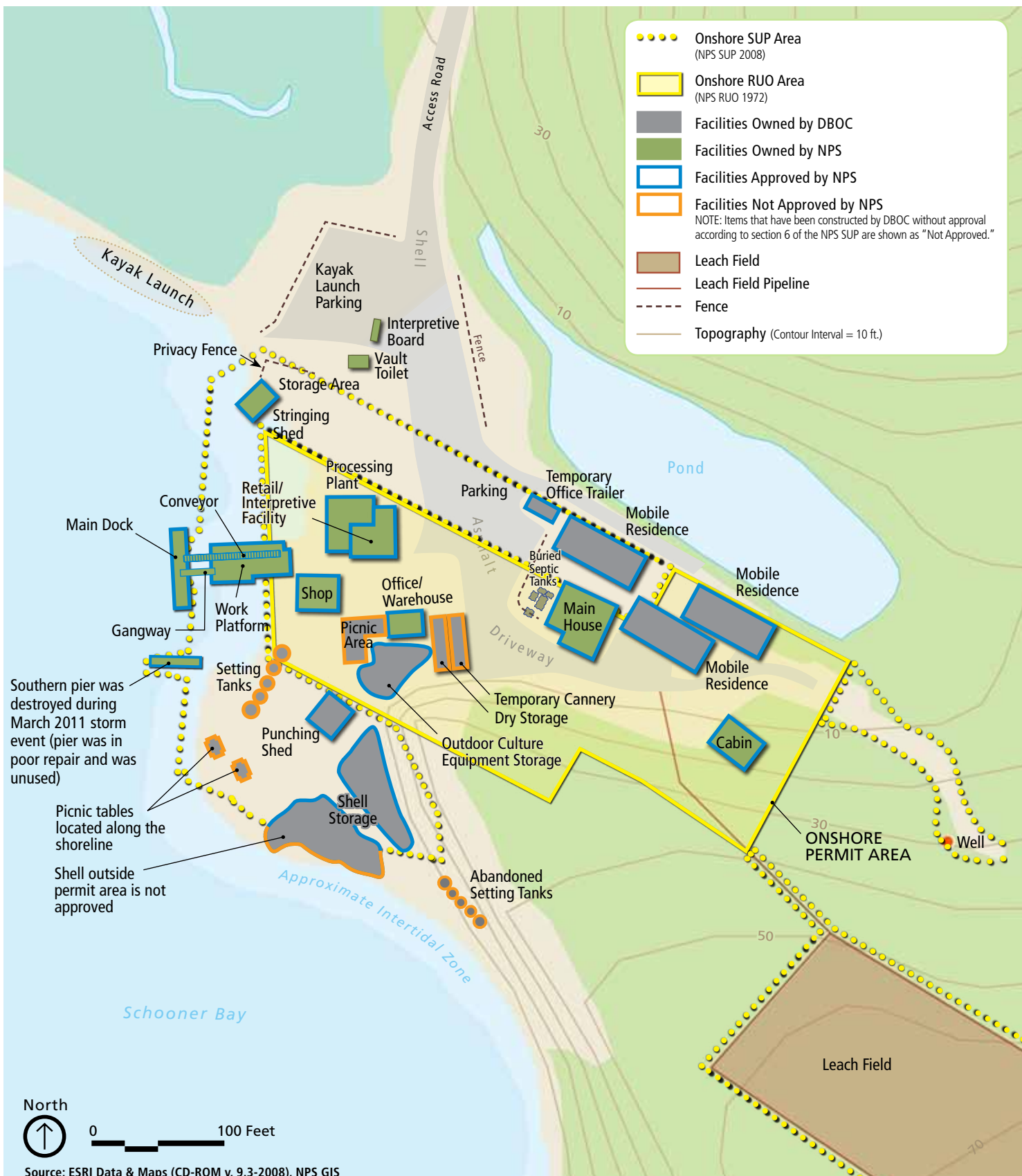
FIGURE ES-2

Existing Conditions (Offshore Operations)



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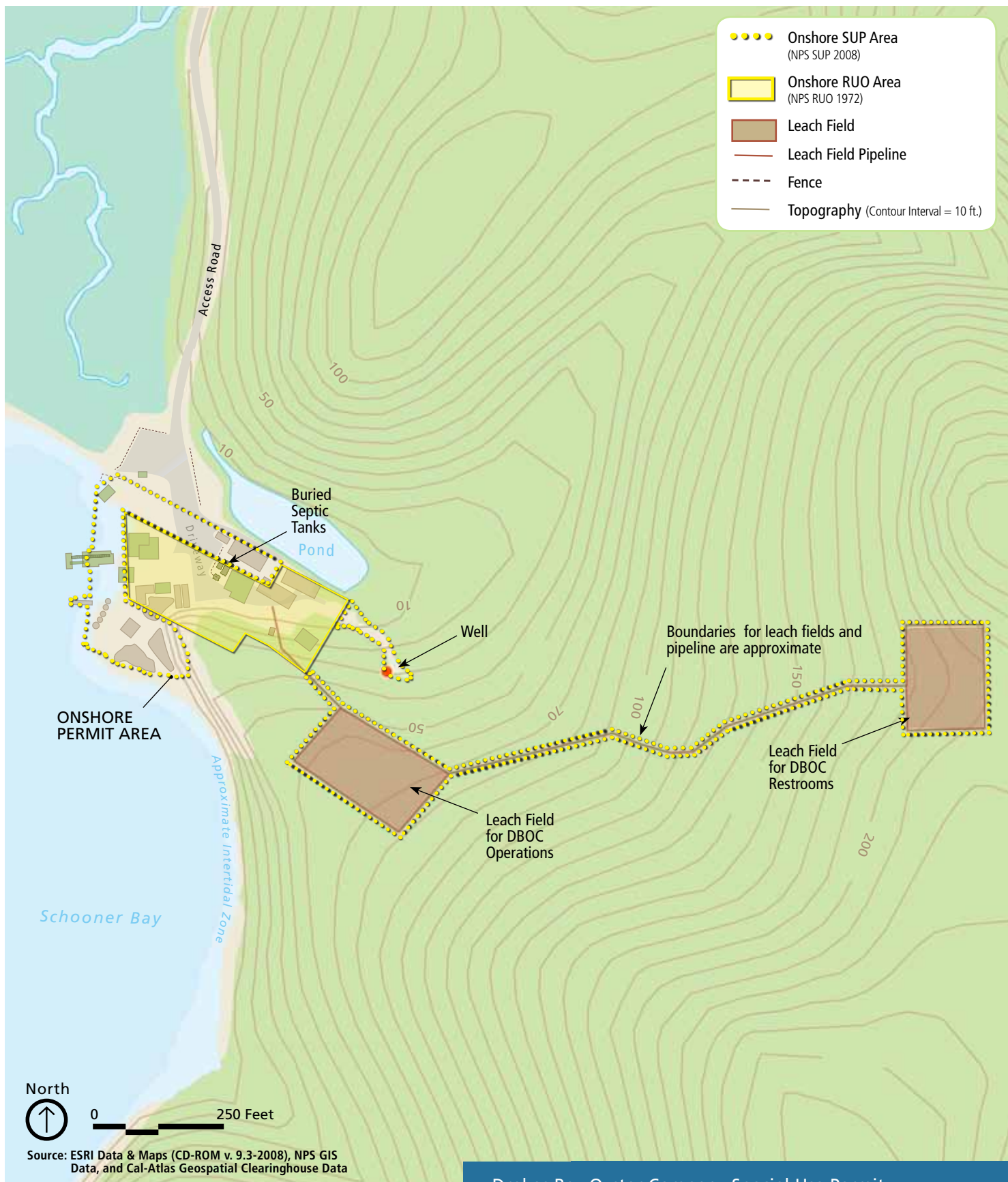
FIGURE ES-3  
Existing Conditions (Onshore Operations)



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**FIGURE ES-4**  
**Existing Water and Septic Utilities**

DBOC currently grows two species of shellfish: Pacific oyster and manila clam. The 2008 SUP authorized DBOC to generally operate within the same offshore boundaries as contained in Lease M-438-01 (1,049 acres)<sup>2</sup> and Lease M-438-02 (1 acre). Within the offshore lease boundaries, DBOC maintains 142 acres of shellfish growing areas. Shellfish growing areas are otherwise known as “culture beds” or simply “beds” and can include any of the shellfish cultivation methods. The 142 acres comprise 42 numbered culture beds (see figure ES-2). DBOC cultivates shellfish using two primary methods: rack culture and bag culture. Oysters are grown using both methods. Manila clams are grown using bag culture. DBOC maintains 95 wooden racks for cultivation, which total approximately 5 miles when laid end-to-end (also expressed as 7 acres), within Drakes Estero. Currently, six of these racks fall outside the permit boundaries. Additional detail about DBOC’s offshore facilities are described in chapter 2 of the EIS.

DBOC onshore facilities support the processing, sale, and initial stages of shellfish culture (see figure ES-3). For the most part, these facilities are located within the 1.5 acres of the original RUO, the additional 1.1 acres established with the issuance of the 2008 SUP, and 2.0 acres encompassing the well and septic areas (shown on figure ES-4). DBOC packages its shellfish on site and operates the only on-site shellfish cannery in California. DBOC facilities currently outside the authorized area include unused setting tanks and some of the oyster shell storage mounds. See chapter 2 of the EIS for additional detail related to DBOC’s onshore facilities.

## ISSUES AND IMPACT TOPICS

Many resources have the potential to be affected by either issuing or not issuing a SUP for continued mariculture within the Seashore. These resources were initially identified by NPS staff during internal scoping and were further refined through the public and agency scoping process. Some impact topics were considered but dismissed from further analysis because either (a) the resources do not exist in the project area or would not be impacted by the project or (b) impacts would have less than minor impacts. The tables below outline the issues and impact topics retained for further analysis (table ES-1) and those that were considered, but dismissed (table ES-2), and the rationale for doing so. Impact topics retained for detailed analysis within the EIS include wetlands, eelgrass, wildlife and wildlife habitat, special-status species, coastal flood zones, water quality, soundscapes, wilderness, visitor experience and recreation, socioeconomic resources, and NPS operations. Dismissed topics include vegetation, lightscapes, air quality, climate change and greenhouse gas emissions (carbon footprint), geological resources, paleontological resources, cultural resources, and environmental justice.

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<sup>2</sup> Since the consolidation of several allotments into Lease M-438-01 in 1979, the lease language has specified that the lease area is made up of two parcels totaling approximately 1,059 acres; however, the GIS data provided by CDFG in 2011 for this lease area measures 1,049 acres. For the purposes of this EIS, all area calculations are based on GIS data. Therefore, the latter measurement is used to represent existing conditions throughout this EIS.

TABLE ES-1. ISSUES AND IMPACT TOPICS RETAINED FOR ANALYSIS

Issue/Impact Topic	Rationale for Retention
Wetlands	<p>The identification of wetlands within the project area is necessary to ensure their protection in accordance with federal laws (section 404 of the Clean Water Act [CWA] and the Rivers and Harbors Act of 1899) and state laws (the California Coastal Act of 1976 and the California Environmental Quality Act). NPS <i>Management Policies 2006</i> states that NPS will implement a “no net loss of wetlands” policy and will (1) provide leadership and take action to prevent the destruction, loss, or degradation of wetlands; (2) preserve and enhance the natural and beneficial values of wetlands; and (3) avoid direct and indirect support of new construction in wetlands unless there are no practicable alternatives and the proposed action includes all practicable measures to minimize harm to wetlands (NPS 2006d). Guidance related to the management of wetlands is further clarified by Director’s Order 77-1: <i>Wetland Protection</i> (DO-77-1) (NPS 2002a). As defined by U.S. Army Corps of Engineers (USACE) and U.S. Fish and Wildlife Service (USFWS), wetland areas exist in the project area, both within Drakes Estero and along the shoreline where natural conditions persist. DBOC operations may have the potential to impact these wetlands through placement of materials (such as bags and trays) directly in wetlands, trampling of vegetated wetlands, and shading associated with racks, as well as people walking across mudflats, and propellers and boat hulls scraping the mud bottom and eelgrass beds. The impact topic of wetlands is retained for detailed analysis in the EIS.</p>
Eelgrass	<p>In Drakes Estero, eelgrass (<i>Zostera marina</i>) is the dominant form of submerged aquatic vegetation and is present throughout Drakes Estero in dense beds. Eelgrass beds provide important foraging and feeding ground for many aquatic organisms, they serve as the base of the food web in many coastal habitats, and they perform important environmental functions, such as trapping sediment, taking up excess nutrients, and protecting shorelines from erosion. Eelgrass beds are classified as a type of “special aquatic site,” a category of “Waters of the United States” afforded additional consideration under the CWA section 404 (b)(1) guidelines developed by the Environmental Protection Agency (EPA). Special aquatic sites possess characteristics of productivity, habitat, wildlife protection, or other important and easily disrupted ecological values. These sites are recognized as significantly influencing or positively contributing to the overall environmental health or vitality of the entire ecosystem of a region. DBOC operations in Drakes Estero and the eelgrass beds interact “via changes each makes to the immediate environment like altering water flow, sediment structure, light penetration, and nutrient supply. Other environmental changes arising from mariculture come from the addition of structures (e.g., bags, racks, and lines) and disturbances of transportation and culture operations” (NAS 2009). The termination or continuation of these activities related to DBOC operations could beneficially or adversely impact eelgrass. Therefore, the impact topic of eelgrass is retained for detailed analysis in the EIS.</p>
Wildlife and Wildlife Habitat	<p>Drakes Estero provides habitat for multiple native wildlife species, including benthic fauna (animals living on or in the submerged substrate), fish, harbor seals, and birds. Drakes Estero also includes those owned, nonnative species propagated by DBOC, as well as several nonnative invasive species such as the tunicate, <i>Didemnum vexillum</i> and the mud snail, <i>Batillaria attramentaria</i>. Commercial shellfish operations could potentially impact these species and their habitat through habitat competition, habitat improvement or degradation, noise and physical disruptions, and introduction of nonnative species. The impact topic of wildlife and wildlife habitat is retained for detailed analysis in the EIS.</p>
Special-Status Species	<p>The Endangered Species Act (ESA) mandates that all federal agencies consider the potential impacts of their actions on species listed as threatened or endangered in order to protect the species and preserve their habitats. USFWS and the National Marine Fisheries Service (NMFS) share responsibility for implementing the ESA. Per informal consultations with USFWS in 2010 and previous studies, seven federally listed threatened and endangered species were identified as potentially affected by activities within the project area. These include Myrtle’s silverspot butterfly (<i>Speyeria zerene myrtilae</i>), California red-legged frog (<i>Rana aurora draytoni</i>), central California coast Coho salmon (<i>Oncorhynchus kisutch</i>), central California coast steelhead (<i>O. mykiss</i>), leatherback sea turtle (<i>Dermochelys coriacea</i>), western snowy plover (<i>Charadrius alexandrinus nivosus</i>), and California least tern (<i>Sternula antillarum</i>). The Coho salmon and the least tern are also state-listed species. Based on the location of DBOC operations relative to special-status species and their habitat, and resultant threats to those species, the impact topic of special-status species is retained for detailed analysis in the EIS.</p>

TABLE ES-1. ISSUES AND IMPACT TOPICS RETAINED FOR ANALYSIS (CONTINUED)

Issue/Impact Topic	Rationale for Retention
Coastal Flood Zones	Pursuant to Director's Order 77-2: <i>Floodplain Management</i> (DO-77-2), NPS must strive to preserve floodplain values and minimize hazardous floodplain conditions (NPS 2003a). Although no formal floodplain mapping has been undertaken at the planning site, a topographic survey was performed at the onshore facilities based on North American Vertical Datum of 1988 (NAVD-88). The purpose of the survey was to verify the topographic elevations of the onshore features and correlate those elevations to elevations associated with flood events. Further, it has been observed that some buildings associated with DBOC operations have been prone to flooding during severe storm events. In addition, the National Oceanic and Atmospheric Administration (NOAA) identifies regions subject to potential tsunami inundation, and Drakes Estero falls within the tsunami inundation zone (State of California Emergency Management Agency 2009). Placement of structures within the 100-year floodplain is inconsistent with NPS floodplain management policies, and the continued presence of these structures in the floodplain has the potential to impact floodplain values, DBOC facilities, and the safety of those employees living in structures within the coastal flood zone. The impact topic of coastal flood zones is retained for detailed analysis in the EIS.
Water Quality	DBOC commercial shellfish operations within and adjacent to Drakes Estero have the potential to impact water quality, both surface waters and groundwater. Nonpoint sources of pollution specific to land development and the commercial shellfish operations include onshore impervious stormwater runoff, boat operation, pulse disturbances to Drakes Estero substrate from maintaining oyster racks and placing/overturning/removing bottom bags in Drakes Estero, accidental spill of fuel/oil, and accidental spill/leaks of wastewater from underground septic tanks. In addition, water used to clean the oysters and other discharges from sources used in the cultivation process may contribute to water quality impacts. Floating debris (plastic tubing, bags, piping, etc.) associated with the commercial shellfish operation may also impact water quality. As identified during public scoping, shellfish cultivation in Drakes Estero (specifically the presence of filter-feeding organisms) may result in beneficial impacts on water quality. The impact topic of water quality is retained for detailed analysis in the EIS.
Soundscapes	In accordance with NPS <i>Management Policies 2006</i> and Director's Order 47: <i>Soundscape Preservation and Noise Management</i> (DO-47), an important part of the NPS mission is preservation of natural soundscapes within units of the national park system (NPS 2006d, 2000). Natural soundscapes "encompass all the natural sounds that occur in parks, including the physical capacity for transmitting those natural sounds and the interrelationships among park natural sounds of different frequencies and volumes. Natural sounds occur within and beyond the range of sounds that humans can perceive, and they can be transmitted through air, water, or solid materials" (NPS 2006d). As identified during public scoping, components of DBOC operations, such as motorized boats and pneumatic drills, create noise that may impact park visitors and wildlife and disturb the natural soundscape of the area. The impact topic of soundscapes is retained for detailed analysis in the EIS.
Wilderness	A wilderness area is defined, in part, as "an area where the earth and its community of life are untrammeled by man, where man himself is a visitor who does not remain. . . . An area of undeveloped Federal land retaining its primeval character and influence, without permanent improvements or human habitation" (PL 88-577). Pursuant to PL 94-544 and 94-567, Congress designated 1,363 acres within Drakes Estero as potential wilderness. Drakes Estero was designated as potential wilderness rather than full wilderness due to the presence of the commercial oyster operation, a nonconforming use. Removal of DBOC operations upon expiration of existing authorizations would allow the congressionally designated potential wilderness to be converted to congressionally designated wilderness. Conversely, should a new SUP be issued, the area would remain as congressionally designated potential wilderness for another 10 years. The impact topic of wilderness is retained for detailed analysis in the EIS.



TABLE ES-1. ISSUES AND IMPACT TOPICS RETAINED FOR ANALYSIS (CONTINUED)

Issue/Impact Topic	Rationale for Retention
Visitor Experience and Recreation	NPS strives to provide opportunities for forms of enjoyment that are uniquely suited and appropriate to the natural and cultural resources found in park units. During public scoping it became evident that some visitors to the Seashore view the commercial oyster operation as an integral part of their visit while other visitors view the commercial operation as an adverse impact on their enjoyment of solitude and the natural setting and resources of the site, as well as their wilderness experience. The primary focus of DBOC is the commercial operation for sale of shellfish to restaurants and the wholesale shellfish market outside the park. These are not commercial services being offered to the visiting public to further the public's use and enjoyment of the park. As such, these are not visitor services. Expiration of existing authorizations may reduce the satisfaction of these visitors, because they would no longer be able to purchase oysters or interact with DBOC staff. The impact topic of visitor experience and recreation is retained for detailed analysis in the EIS.
Socioeconomic Resources	As part of the NEPA process, NPS assesses the impacts of each alternative on socioeconomic resources. Expiration of the existing RUO and associated SUP and termination of DBOC's commercial operations could result in beneficial and/or adverse impacts on the current staff and on DBOC, as well as on the regional economy and statewide shellfish production. The impact topic of socioeconomic resources is retained for detailed analysis in the EIS.
NPS Operations	Each of the proposed alternatives could result in changes to Seashore operations and infrastructure near and within Drakes Estero. Seashore staff and available funding are key elements to promoting and protecting natural and cultural resources within the Seashore. Issuance of a new SUP to DBOC would require improved SUP monitoring and enforcement by Seashore staff, including review of proposed changes at DBOC and coordination with other state and local agencies. The impact topic of NPS operations is retained for detailed analysis in the EIS.

TABLE ES-2. ISSUES AND IMPACT TOPICS CONSIDERED BUT DISMISSED FROM FURTHER ANALYSIS

Issue/Impact Topic	Rationale for Dismissal
Vegetation	Vegetation cover types within the Drakes Estero watershed include wetlands, coastal dune, coastal scrub, grassland, pasture, and riparian woodland. Coastal scrub and wetlands are the only vegetation types that exist within the immediate project area. Wetlands are discussed as a separate impact topic, because there is the potential for these resources to be impacted by the alternatives considered in the EIS. The coastal scrub vegetation cover type is present around the onshore DBOC facilities and along the main access road. The proposed alternatives would not directly impact the coastal scrub vegetation; therefore, the impact topic of vegetation is dismissed from further analysis in the EIS.
Lightscares	In accordance with NPS <i>Management Policies 2006</i> , NPS strives to preserve natural ambient landscapes and other values that exist in the absence of human-caused light (NPS 2006d). There are two pole-mounted overhead lights within the project area to provide safety lighting after dark. Low levels of light also emanate from the DBOC residences. DBOC does not perform commercial shellfish operations after dark. In addition, visitor use of the area after dark is minimal. These low levels of light do not have a noticeable impact on natural resources or visitor enjoyment. Given the proximity of the project area to the San Francisco metropolitan area, the lightscape within the Seashore has already been degraded by the light pollution surrounding San Francisco. The impact topic of lightscares is dismissed from further analysis in the EIS.

TABLE ES-2. ISSUES AND IMPACT TOPICS CONSIDERED BUT DISMISSED FROM FURTHER ANALYSIS (CONTINUED)

Issue/Impact Topic	Rationale for Dismissal
Air Quality	<p>The Seashore, a Class I airshed, is located within the San Francisco Bay nonattainment areas for 8-hour ozone, 1-hour ozone, and fine particulate matter (less than 2.5 micrometers) (PM<sub>2.5</sub>) as defined by the National Ambient Air Quality Standards set forth in the Clean Air Act (EPA 2011) and further specified by the Bay Area Air Quality Management District (BAAQMD 2010). The primary air pollutant sources associated with the San Francisco Bay Area are related to urban activities (i.e., commuting). Ongoing activities within the Seashore have a minimal contribution to air pollution in the nonattainment area.</p> <p>Volatile organic compounds (VOCs) are a general class of compounds containing hydrogen and carbon and are a precursor to the formation of the pollutant ozone. While concentrations of VOCs in the atmosphere are not generally measured, ground-level ozone is measured and used to assess potential health effects. When combustion temperatures are extremely high, as in automobile engines, atmospheric nitrogen gas may combine with oxygen gas to form various oxides of nitrogen. Of these, nitric oxide (NO) and nitrogen dioxide (NO<sub>2</sub>) are the most significant air pollutants. This group of pollutants is generally referred to as nitrogen oxides or NO<sub>x</sub>. Nitric oxide is relatively harmless to humans but quickly converts to NO<sub>2</sub>. Nitrogen dioxide has been found to be a lung irritant and can lead to respiratory illnesses. Nitrogen oxides, along with VOCs, are also precursors to ozone formation. Emissions of VOCs and NO<sub>x</sub> react in the presence of heat and sunlight to form ozone in the atmosphere. Accordingly, ozone is regulated as a regional pollutant and is not assessed on a project-specific basis.</p> <p>"De minimis" emissions are limits for general conformity with federal actions (i.e., "thresholds") for nonattainment ozone and particulate matter. Because ozone is a by-product of volatile organic compounds and nitrogen oxide, threshold levels for ozone are based on threshold levels of ozone precursors: VOCs and NO<sub>x</sub>. The threshold levels for VOCs and NO<sub>x</sub> are 54 pounds/day and 10 tons/year. Threshold levels for PM<sub>2.5</sub> also are 54 pounds/day and 10 tons/year (BAAQMD 2010).</p> <p>DBOC's direct and indirect emissions contribution to nonattainment was estimated for all activities (i.e., motorboats, maintenance equipment, employee vehicles, and trucks for transporting the shellfish). The results indicate that all DBOC emissions are equal to or below 3.5 tons per year for all nonattainment pollutants (chapter 1, table 1-1). The calculated levels for DBOC emissions related to NO<sub>x</sub> are 2 to 4 pounds/day and 0.3 to 0.5 tons/year. The calculated levels for reactive organic gas (ROG) are 11 to 24 pounds/day and 1.6 to 3.5 tons/year. The calculated levels for both ozone precursors, ROG<sup>3</sup> and NO<sub>x</sub>, from DBOC operations fall well below threshold levels. The levels of PM<sub>2.5</sub> discharge from DBOC boat emissions are considered to be negligible.</p> <p>DBOC operations meet general conformity requirements because their regional emissions are well below the de minimis threshold levels established by federal and state general conformity requirements. If the no-action alternative is selected, emission levels would be well below levels calculated for DBOC operations, as all motorized activity in the water and onshore would cease with the exception of vehicles using the access road for the kayak launch and occasional administrative use of motorized boats, which would be subject to evaluation under minimum requirements and minimum tool determination processes as required by the Wilderness Act. Based on the calculated levels, the impact topic of air quality is dismissed from detailed analysis in the EIS.</p>

<sup>3</sup> According to EPA, VOC, and ROG are synonymous. VOC excludes methane and ethane and ROG, as used by California, only references methane.

TABLE ES-2. ISSUES AND IMPACT TOPICS CONSIDERED BUT DISMISSED FROM FURTHER ANALYSIS (CONTINUED)

Issue/Impact Topic	Rationale for Dismissal
Climate Change and Greenhouse Gas Emissions (Carbon Footprint)	<p>Climate change refers to any significant change in average climatic conditions (such as mean temperature, precipitation, or wind) or variability (such as seasonality, storm frequency, etc.) lasting for an extended period (decades or longer). Recent reports by the U.S. Climate Change Science Program, the NAS, and the United Nations Intergovernmental Panel on Climate Change (IPCC) provide clear evidence that climate change is occurring and will accelerate in the coming decades. There is strong evidence that global climate change is being driven by human activities worldwide, primarily the burning of fossil fuels and tropical deforestation. These activities release carbon dioxide and other heat-trapping gases, commonly called "greenhouse gases," into the atmosphere (IPCC 2007a, 2007b, 2007c, 2007d).</p> <p>There are two aspects of climate change that must be considered in an environmental impact analysis: (1) Human impact on climate change: i.e., through actions, the potential to increase or decrease emissions of greenhouse gases that contribute to climate change; and (2) The impact of climate change on humans: i.e., how the resources that are managed are likely to change in response to changing climate conditions, and how that changes or otherwise affects management actions and the impacts of those actions on the resource.</p> <p>Some of the activities associated with DBOC operations result in fossil fuel consumption (e.g., motorboats within Drakes Estero and trucks associated with the transportation of shellfish). Equipment used to maintain DBOC facilities, access roads, and parking areas also consume fossil fuels. However, greenhouse gas emissions associated with any of the alternatives involving issuing a new SUP would likely be negligible.</p> <p>Additionally, some comments submitted during public scoping suggested that the quantity of greenhouse gas emissions (the carbon footprint) associated with oyster consumption would increase if a new SUP was not issued to DBOC (the no-action alternative) because of the loss of the local food source. Some comments suggested that without DBOC, the distance oysters would be transported to meet demand in the San Francisco Bay Area would greatly increase, thus increasing the overall greenhouse gas emissions. It is not clear how the shellfish market would respond should this local source cease operations. Local demand could be met in the future by various means. Oysters could be shipped in from outside the local area, which would increase the carbon footprint associated with transporting the product. Conversely, other local commercial shellfish operations may increase their production and distribution of oysters to the local market, which would result in a carbon footprint similar to existing conditions. Agencies are not required to engage in speculation or analyze indirect effects that are highly uncertain (CEQ 1981, Q18 [48 Fed. Reg. 18027]). While greenhouse gas emissions associated with the no-action alternative may potentially be greater due to increased transportation distances, they are also likely to be negligible in comparison to local, regional, and national greenhouse gas emissions.</p> <p>In addition, the effects of climate change on park resources over the 10-year planning horizon for the EIS are likely to be negligible. Issues associated with climate change's impact on the Seashore resources (rising sea temperatures, sea level rise, ocean acidification, etc.) are addressed in applicable sections of chapters 3 and 4. The contribution of the actions contemplated in the EIS on climate change is likely to be negligible and is dismissed from further analysis.</p>
Geological Resources	<p>NPS <i>Management Policies 2006</i> directs NPS to preserve and protect geologic resources as integral components of park natural systems (NPS 2006d). Cultivation of shellfish within Drakes Estero and the processing facilities on the land are unlikely to affect geologic processes and resources, including soils and topography. Current sediment transport processes, which may be impacted by actions proposed in the EIS, are analyzed in the water quality section of the EIS. The impact topic of geologic resources is dismissed from further analysis in the EIS.</p>

TABLE ES-2. ISSUES AND IMPACT TOPICS CONSIDERED BUT DISMISSED FROM FURTHER ANALYSIS (CONTINUED)

Issue/Impact Topic	Rationale for Dismissal
Paleontological Resources	<p>Paleontological resources are defined as “resources such as fossilized plants, animals, or their traces, including both organic and mineralized remains in body or trace form” (NPS 2006d). NPS <i>Management Policies 2006</i> directs NPS to preserve and protect paleontological resources in terms of the geologic data associated with the resource to provide information about the ancient environment (NPS 2006d). Paleontological resources have been identified within the Seashore, including concretions near the project area. These resources are outside the immediate project area and therefore would not be impacted by the proposed actions. Additionally, it is unlikely that activities associated with the proposed actions would disturb any undiscovered paleontological resources, as ground disturbance is not proposed outside the development area. The impact topic of paleontological resources is dismissed from further analysis in the EIS.</p>
Cultural Resources	<p>The National Historic Preservation Act (NHPA) recognizes five property types: districts, sites, buildings, structures, and objects. These categories are used to list properties in the National Register of Historic Places (National Register). To manage these property types, NPS “categorizes cultural resources as archeological resources, cultural landscapes, museum objects, and ethnographic resources” (NPS 2002b).</p> <p>The Determination of Eligibility (DOE) prepared for DBOC onshore and offshore operations (Caywood and Hagen 2011) and State Historic Preservation Officer (SHPO) concurrence (SHPO 2011), determined that while the oyster-growing facility in Drakes Estero is significantly associated with the rebirth and development of the California oyster industry in the 1930s, the property is ineligible for listing in the National Register because it lacks historic integrity. While the property retains integrity of location, setting, and association, and the property’s setting has not changed since the early 1930s, a combination of alterations, including a general lack of material and design integrity, as well as the addition of modern structures, has altered the appearance of the JOC (now DBOC) operation. Today, the plant bears little resemblance to the facility of the early 1960s, which in turn adversely affects the property’s integrity of feeling. In a letter dated April 5, 2011, NPS submitted the DOE to the California SHPO, requesting concurrence with the finding that the property is ineligible for listing on the National Register. NPS received a response from SHPO on August 4, 2011 (see appendix D) in which SHPO concurred with NPS determination that none of the facilities associated with DBOC’s operation are eligible for listing on the National Register (SHPO 2011).</p>
Archeological Resources	<p>Archeological resources are the remains of past human activity and records documenting the scientific or scholarly analysis of these remains. For over 2,000 years, humans have inhabited the Point Reyes Peninsula, employing its rich resources and modifying aspects of the landscape to meet their changing needs. Approximately 100 Coast Miwok archeological sites document a culture that was an integral part of the ecosystem (Sadin 2007). One known archeological site (CA-MRN-296) exists within the project area and is associated with the Coast Miwok whose descendents are members of the Federated Indians of Graton Rancheria, a federally recognized Tribe. The site is a contributing resource in a draft National Register of Historic Places district nomination for indigenous archeological sites within the Seashore. Under all proposed action alternatives, the known archeological site would be afforded additional protection by excluding it from the SUP boundary. There would be a slight potential for disturbance of the site to occur as a result of unauthorized access. Disturbance in the worst case could take the form of digging or looting. It would be unlikely though that any disturbance would result in a loss of integrity sufficient to alter the significance of the site.</p>

TABLE ES-2. ISSUES AND IMPACT TOPICS CONSIDERED BUT DISMISSED FROM FURTHER ANALYSIS (CONTINUED)

Issue/Impact Topic	Rationale for Dismissal
<i>Archeological Resources</i> (continued)	<p>In the event that unknown archeological resources are discovered during construction, the park's Cultural Resources Division will be notified immediately and work in the immediate area will cease until the discovery is evaluated by a qualified archeologist. The discovery process defined by 36 CFR 800.13, the implementing regulations for NHPA (16 U.S.C. 470), will be applied. Evaluation of the discovery's significance will include consultation as appropriate with the Federated Indians of Graton Rancheria, SHPO, and the Advisory Council on Historic Preservation. In the event that human remains, funerary objects, sacred objects, or objects of cultural patrimony are discovered during construction the process defined by 43 CFR 10.4-5, the implementing regulations of the Native American Graves Protection and Repatriation Act (25 U.S.C. 3001), will be applied. It will include but not necessarily be limited to immediate notification of the Seashore's Superintendent and Cultural Resources Division, cessation of work in the immediate vicinity, protecting the objects of discovery, notifying the culturally affiliated Tribe, consulting with the culturally affiliated Tribe, and preparing a written plan of action.</p> <p>For the purposes of section 106 of the NHPA, potential impacts under any of the alternatives would likely result in a determination of no adverse effect. For all ground disturbing activities within the onshore areas of DBOC, archeological identification studies including construction monitoring by a qualified archeologist may be required to determine the presence of unknown or buried archeological resources. The impact topic of archeological resources is dismissed from further analysis in the EIS.</p>
<i>Cultural Landscapes</i>	<p>According to NPS-28: <i>Cultural Resource Management Guideline</i> (NPS 2002b), a cultural landscape is a reflection of human adaptation and use of natural resources and is often expressed in the way land is organized and divided, patterns of settlement, land use, systems of circulation, and the types of structures that are built. The character of a cultural landscape is defined both by physical materials, such as roads, buildings, walls, and vegetation, and by use reflecting cultural values and traditions. No eligible cultural landscapes have been identified in the project area (Caywood and Hagen 2011); therefore, the impact topic of cultural landscapes is considered but dismissed from further analysis in the EIS. For purposes of section 106 of the NHPA, potential impacts under any of the alternatives would likely result in a determination of no historic properties affected.</p>
<i>Historic Structures</i>	<p>Because shellfish mariculture within Drakes Estero dates back approximately 77 years, a DOE was conducted to identify any properties within the project area that are eligible for listing on the National Register pursuant to section 106 of NHPA (36 CFR 800), as amended. A historic structure is defined by NPS-28 as "a constructed work, usually immovable by nature or design, consciously created to serve some human act" (NPS 2002b). To be listed on or eligible for listing on the National Register, a site, structure, object, or district must possess historic integrity of those features necessary to convey its significance, particularly with respect to location, setting, design, feeling, association, workmanship, and materials. The Seashore preserves historic structures, such as the Point Reyes Lighthouse, listed in the National Register, and the Lifeboat Station, a National Historic Landmark. Based on the results of the DOE, as described above, none of the structures within the project area has been identified as eligible for listing on the National Register; therefore, the project would not impact historic structures. Because there are no historic structures identified within the project site, this impact topic is dismissed from further analysis in the EIS. For purposes of section 106 of the NHPA, potential impacts under any of the alternatives would likely result in a determination of no historic properties affected.</p>
<i>Ethnographic Resources and Sacred Sites</i>	<p>An ethnographic resource is defined as any "site, structure, object, landscape, or natural resource feature assigned traditional legendary, religious, subsistence, or other significance in the cultural system of a group traditionally associated with it" (NPS 2002b). The Federated Indians of Graton Rancheria are culturally affiliated with the Seashore and have expressed concern that their cultural legacy may be impacted if a new SUP is issued to DBOC (FIGR 2007). However, no traditional cultural properties have been identified within the project area. One Coast Miwok archeological site has been identified within the project area; however, the project would not affect this site, as described above under "Archeological Resources." Therefore, the impact topic of ethnographic resources and sacred sites is dismissed from further analysis in the EIS.</p>

TABLE ES-2. ISSUES AND IMPACT TOPICS CONSIDERED BUT DISMISSED FROM FURTHER ANALYSIS (CONTINUED)

Issue/Impact Topic	Rationale for Dismissal
<i>Indian Trust Resources</i>	The federal Indian Trust is a legally enforceable obligation on the part of the United States to protect tribal lands, assets, resources, and treaty rights, and it creates a duty to carry out the mandates of federal laws with respect to Native American Tribes. Of the federally recognized Tribes pursuant to PL 103-454, 108 Stat. 4791, the Federated Indians of Graton Rancheria/Coast Miwok is the only Tribe affiliated with the Seashore. However, there are no known Indian Trust resources in the study area, and the lands composing the Seashore are not held in trust by the Secretary for the benefit of Indians. Therefore, the impact topic of Indian Trust resources is dismissed from further analysis in the EIS.
<i>Museum Collections</i>	A museum collection is an assemblage of objects, works of art, historic documents, and/or natural history specimens collected according to a rational scheme and maintained so that they can be preserved, studied, and interpreted for public benefit (NPS 2002b). The project area does not include any museum collection or objects; therefore, the impact topic of museum collections is dismissed from further analysis in the EIS.
Environmental Justice	<p>Executive Order 12898, "General Actions to Address Environmental Justice in Minority Populations and Low-income Populations," requires all federal agencies to identify and address the disproportionately high and/or adverse human health or environmental impacts of their programs and policies on minorities and low-income populations and communities (EPA 1994). Marin County has one of highest per capita incomes in the country, and its population is predominantly white. To evaluate potential impacts to low-income and minority populations, U.S Census 2000 data was compared to thresholds defined by the Metropolitan Transportation Commission (MTC) during development of their Transportation Improvement Program for the San Francisco Bay Area. The MTC established a low-income threshold of 30 percent, whereby any community whose population consists of more than 30 percent low-income residents would be considered a "community of concern" (MTC 2010). Similarly, the MTC's threshold for minority populations is 70 percent; therefore, any community whose population is comprised of more than 70 percent minorities would be considered a "community of concern" (MTC 2010). Although census data from 2009 is used in the Chapter 3 discussion of socioeconomic resources, census data from 2000 is the most current complete data available, broken out by census blocks and block groups and was used to identify environmental justice communities within Marin County.</p> <p>According to 2000 census data, the minority population in Marin County, numbering 39,489, is approximately 16 percent of the Marin County population, well below the regional (Bay Area) threshold of 70 percent, meaning that minorities are underrepresented in Marin County in comparison to the Bay Area region. Based on the 2009 minority data provided in Chapter 3, minorities accounted for 18.6 percent of the Marin County population, similar to 2000 data, and still well below the regional threshold. Forty-three census blocks (out of a total of 3,476) within Marin County, composing 0.5 percent of the county's population, are within areas where the concentration of minorities exceeds the regional threshold. The nearest census blocks to DBOC that exceed the regional threshold for minorities are within Inverness (total block population of 3 persons), approximately 5 miles east of DBOC, and Point Reyes Station (total block population of 1 person), approximately 10 miles southeast of DBOC.</p> <p>The low-income population within Marin County, 15,601, is 6.3 percent of the Marin County population, which is also well below the regional threshold of 30 percent. Only two census block groups within Marin County, representing 0.4 percent of the population, are considered environmental justice areas because low-income populations exceed the regional threshold. The two block groups with concentrations of low-income individuals above the regional threshold occur at the south edge of Marin County, in San Rafael, approximately 40 miles southeast of DBOC (figure 1-6) and further south on Angel Island. No census blocks considered environmental justice areas are located within the project area.</p>



TABLE ES-2. ISSUES AND IMPACT TOPICS CONSIDERED BUT DISMISSED FROM FURTHER ANALYSIS (CONTINUED)

Issue/Impact Topic	Rationale for Dismissal
Environmental Justice (continued)	Issuance of a new SUP to DBOC would provide income and housing to facility employees, many of whom individually fall into the category of low income or minority. Expiration of DBOC's existing authorizations would result in the loss of these jobs and on-site housing unless DBOC were able to relocate its operation to another area. The employees of DBOC represent approximately 0.01 percent of the population of Marin County and approximately 3 percent of the population of the Inverness Census Designated Place, which in itself is not considered to be an environmental justice area. It is unlikely that the actions proposed in this EIS would have a disproportionate impact on low-income and minority populations at a regional (countywide) scale. The impact topic of environmental justice is dismissed from further analysis in the EIS.

## ALTERNATIVES

The alternatives selected for detailed analysis are summarized below and in table ES-3. NEPA requires federal agencies to explore a range of reasonable alternatives and to analyze what impacts the alternatives could have on the human environment, which the act defines as the natural and physical environment and the relationship of people with that environment. The analysis of impacts is presented in “Chapter 4: Environmental Consequences.”

The alternatives under consideration must include a no-action alternative, pursuant to 40 CFR 1502.14. Alternative A is the no-action alternative in the EIS. Three action alternatives have been developed for the EIS. The alternatives presented in the EIS, in accordance with NEPA, were developed taking into consideration the results of internal discussions, review of public scoping comments, and consultation with local, state, and other federal agencies. Development of the action alternatives also was informed by the scope and scale of the existing DBOC operations and facilities, as authorized by the existing RUO and 2008 SUP. During the process of developing the EIS, DBOC comments, responses, and submittals to other agencies were reviewed. In addition, DBOC conducted a site tour with the authors. The alternatives development process also included a review of previous documents regarding operations and development within the project area, reference materials, and the recommendations of the NAS report *Shellfish Mariculture in Drakes Estero* (2009).

## ELEMENTS COMMON TO ALL ALTERNATIVES

There are a number of elements common to all alternatives, as listed below. They are as follows:

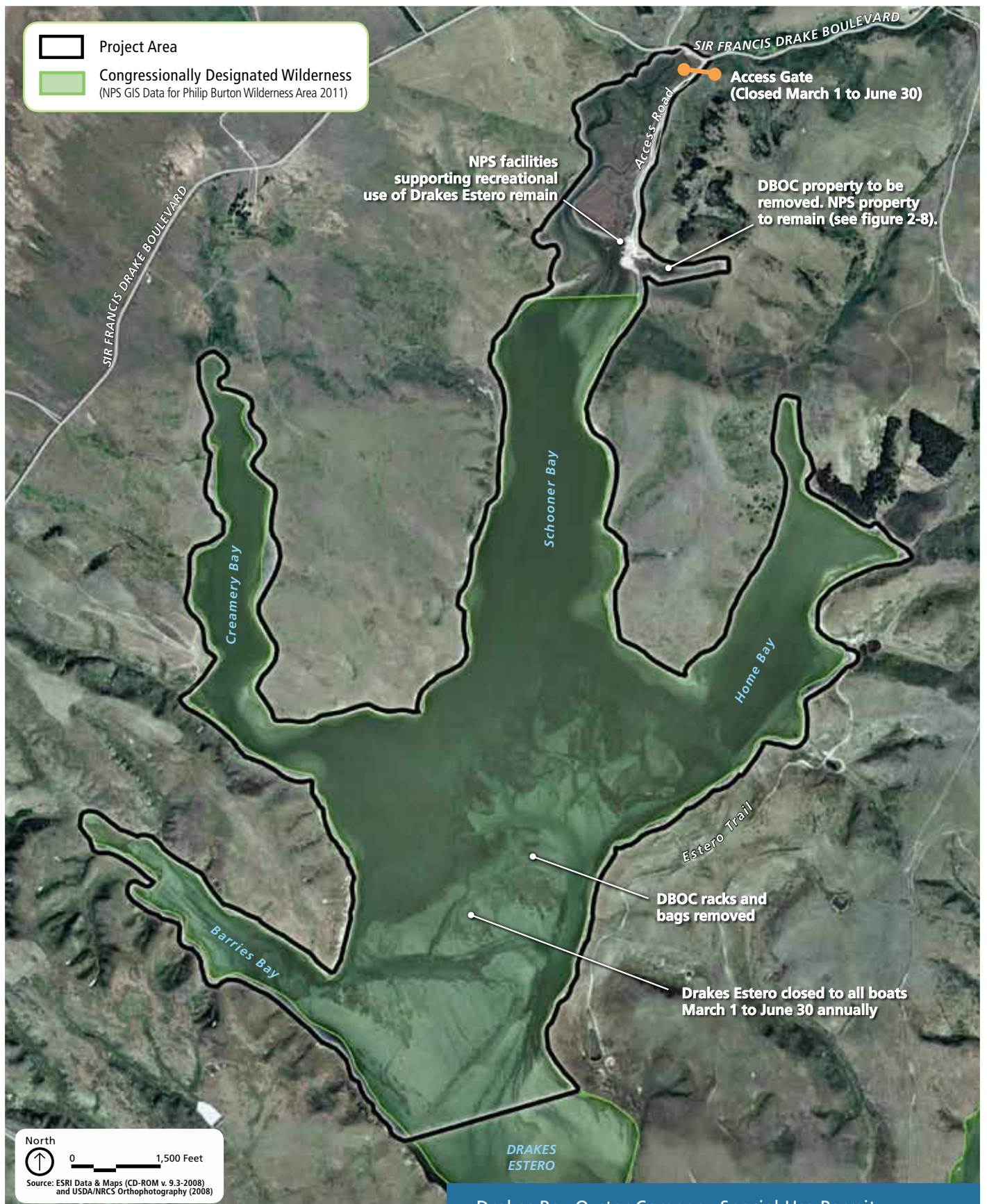
- The current NPS authorizations, which consist of the RUO and the 2008 SUP, expire on November 30, 2012.
- Subsequent to expiration of the SUP, the congressionally designated potential wilderness would be converted to congressionally designated wilderness, although the year in which this takes place would vary between the no-action (2012) and action alternatives (2022).
- NPS would continue to maintain the existing NPS facilities within the project area: the access road, a gravel parking lot, vault toilet, and an interpretive board.

- By the date on which NPS’s authorization(s) to DBOC expire (either 2012 or 2022), DBOC would remain responsible for the removal of certain buildings and structures and all personal property (including any improvements made to the area since 1972). The year in which these removal and restoration activities would take place would vary between the no-action (2012) and action alternatives (2022).
  - DBOC would be responsible for removing all shellfish and shellfish infrastructure including racks from within Drakes Estero as part of the closeout of the permit. There are a number of approaches to remove the racks, ranging from import of a small barge with hydraulic lift to pull the posts to deconstruction using existing barge and boats. While most of the removal activities would be manual, mechanized boats would be required for the duration of the removal activities. It is estimated that approximately 4,700 posts (2-inch by 6-inch boards) and more than 179,000 linear feet of pressure-treated lumber will be removed. It is likely that the removal may take one to two months. The timing of the rack removal would occur outside of the harbor seal closure period (March 1-June 30).
  - Removal of the bag infrastructure would likely occur in conjunction with harvest of the shellfish from Drakes Estero upon closeout. If conducted separately, it is estimated recovery of all anchor materials and lines could take up to 2 weeks and would require the use of boats and barges for hauling.
  - DBOC would be required to restore affected areas to “good order and condition” by the end of the permit term, as specified by section 23(a) of the SUP.
- For any ground disturbing activities conducted within the onshore permit area, archeological identification studies, including construction monitoring by a qualified archeologist, would be required to determine the presence of unknown or buried archeological resources. In the event that unknown archeological resources are discovered during construction, the park’s Cultural Resources Division would be notified immediately and work in the immediate area would cease until the discovery is evaluated by a qualified archeologist. The discovery process defined by 36 CFR 800.13, the implementing regulations for NHPA (16 U.S.C. 470), would be applied.

## **ALTERNATIVE A: NO NEW SPECIAL USE PERMIT—CONVERSION TO WILDERNESS (NO ACTION)**

Alternative A considers the expiration of the existing RUO and SUP and subsequent conversion to wilderness, consistent with PL 94-567. The existing SUP and RUO expire on November 30, 2012. Under Alternative A, the Secretary would not exercise the discretion granted to him under section 124 to issue a new 10-year SUP. Upon removal of the nonconforming structures from Drakes Estero, NPS would convert the area to wilderness. Figures ES-5 and ES-6 illustrate the offshore and onshore conditions that would be expected under this alternative. Specifically, under alternative A:

- DBOC would be required to remove certain buildings and structures, and all of its personal property and undertake steps to restore the area to good order and condition.
- All closeout procedures, including removal of structures, personal property, items related to shellfish cultivation and processing, including all racks and bag arrays distributed within Drakes Estero, would be completed consistent with the terms of the existing RUO and SUP.



## Drakes Bay Oyster Company Special Use Permit Environmental Impact Statement



National Park Service  
U.S. Department of the Interior

Point Reyes National Seashore

FIGURE ES-5

**Alternative A: No New Special Use Permit – Conversion to  
Wilderness (No-action) (Offshore Conditions)**



## Drakes Bay Oyster Company Special Use Permit Environmental Impact Statement

FIGURE ES-6

**Alternative A: No New Special Use Permit – Conversion to Wilderness (No-action) (Onshore Conditions)**



National Park Service  
U.S. Department of the Interior

Point Reyes National Seashore



## ELEMENTS COMMON TO ALL ACTION ALTERNATIVES

There are a number of elements that would be common to all action alternatives (alternatives B, C, and D). They are summarized here and in chapter 2 of the EIS and restated under each alternative. Under all action alternatives, the following actions would take place:

- A new SUP authorized under section 124 of PL 111-88 would be issued to DBOC for a period of 10 years. Because these alternatives include the authorization for DBOC to continue operating for 10 years, the NPS would delay conversion of congressionally designated potential wilderness to congressionally designated wilderness for 10 years. The new SUP would expire on November 30, 2022. No extensions or renewals would be issued because section 124 only authorizes one 10-year permit.
- DBOC would continue to process and pack shellfish in the onshore permit area. However, the scale of DBOC onshore operations would vary by alternative, and the configuration and condition of other onshore facilities would vary by alternative.
- The new SUP would be based on the existing SUP and would include sections of the RUO that are uniquely related to operations in the RUO area.
- DBOC would be required to pay the U. S. fair market value for the use of federal property, which includes onshore and offshore areas within the permit boundaries, as mandated by section 124. If the state water bottom lease continued after November 30, 2012, DBOC would be required to make lease payments to the state in addition to making fair market value payments to the United States.
- DBOC would be required to surrender its state water bottom lease effective November 30, 2012. DBOC would thereafter operate under the terms of the NPS permit. NPS would include certain provisions of the state water bottom lease directly into the new SUP, such as that relating to the escrow account for cleanup of aquaculture leases. California Department of Fish and Game (CDFG) would retain authority under Fish and Game Code to regulate the importation of aquatic organisms into the state by DBOC.
- NPS would exercise oversight of DBOC operations in accordance with the terms of the new permit. NPS would oversee compliance with terms of the SUP and adherence to terms and conditions of the permit including production levels, monitoring of boat operations, adherence to permit boundaries, etc.
- The new permit would require DBOC to remove certain buildings and facilities, any structures or improvements added to the property since 1972, and all its personal property (including shellfish and shellfish rack infrastructure) from the onshore and offshore operating areas. This includes the temporary office trailer, punching shed, temporary cannery, temporary storage, setting tanks, main dock, work platform, sediment basin, mobile homes, picnic area, shell storage, and all other equipment.
- Any new structures developed under the authority of the new permit would be considered personal property and would be removed prior to the expiration of the permit.
- DBOC would be required to restore affected areas to “good order and condition” by the end of the permit term, as specified by section 23(a) of the SUP. NPS would oversee this work and work with DBOC to establish an orderly timetable for removal and to ensure that it is completed prior to the expiration of the new SUP.

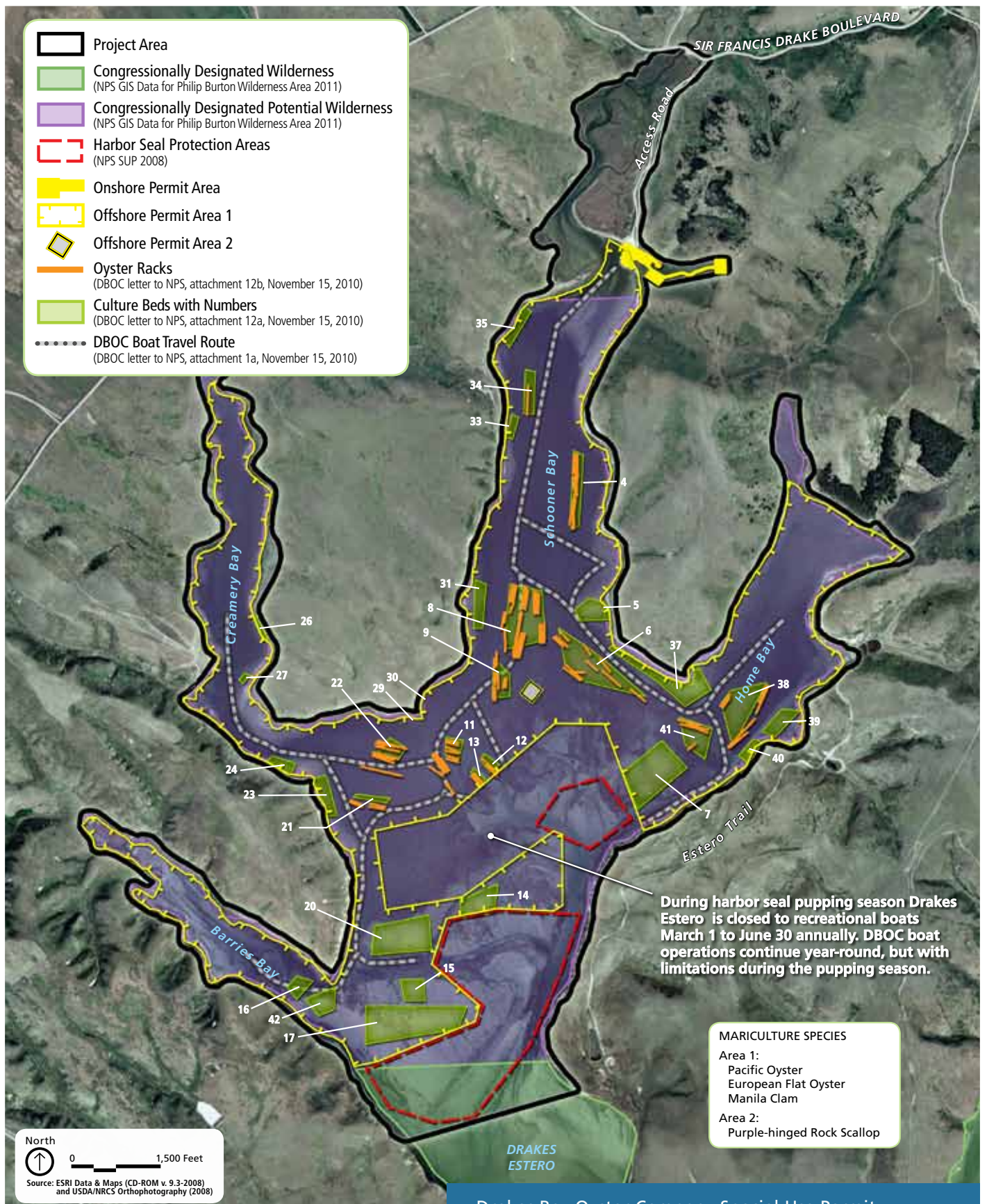
- NPS would adjust the bounds of the permit area to better address areas within Drakes Estero required for shellfish operations. Boundary adjustments would be made to encompass reasonable boat travel routes between culture beds and include the six racks currently located outside the permit boundaries. Boat operations would not be allowed outside of permit boundaries. DBOC would develop a vessel transit plan for implementation pending NPS review, which may include mooring areas and access lanes.
- Permit boundary adjustments also would exclude the harbor seal protection zones and a known archeological site from the new permit boundary. Specific adjustments are described in more detail in chapter 2 of the EIS.
- DBOC operations would be subject to the harbor seal protection protocol, which is part of the current SUP. This protocol prohibits boat travel and general operations, including placement of bags, moorings, and installation of floating racks, within the established harbor seal protection areas (see figure ES-2).
- NPS and CDPH would work to identify an appropriate site or sample timing (high tide) for paralytic shellfish poison (PSP) sampling that meets health and safety requirements, while reducing potential impacts on harbor seals. Additionally, NPS and CDPH would evaluate alternatives to the existing water sampling site within the seal protection area that could reduce the potential for disturbance related to required water quality sample collection.
- DBOC would use and maintain structures in both offshore and onshore areas to support their operations, with variations among the alternatives. Likewise, equipment currently deployed for these activities would also be in use for all action alternatives.
- DBOC would cultivate approximately 138 acres of Drakes Estero using a combination of hanging and bottom culture. Within the 138 acres of culture beds, DBOC would conduct hanging culture using the 95 existing racks in Drakes Estero and would conduct bag culture in up to 84 acres of Drakes Estero (although some of this 84 acres may be left fallow between uses).
- Changes to the permit boundary would incorporate the six racks currently outside the permit area. Any proposal for new racks would require additional review and compliance under the SUP. It is estimated that repair and replacement would occur on 5 percent of the rack structures per year.
- A one-time dredging event at the main dock would occur under the main dock would be dredged by DBOC. Dredging would take place at the outset of the permit term in an area approximately 30 feet wide by 60 feet long and to a depth of approximately 3 feet.
- As with the existing permit and RUO, the new permit would require DBOC to remove all its personal property at the end of the permit term, including racks, culture bags, and other commercial shellfish operations equipment from Drakes Estero. Shellfish owned by DBOC and remaining at the end of the new SUP term also would need to be removed.
- DBOC would replace the existing dock, work platform, and associated structures subject to NPS final review and approval due to the damage from the March 2011 storm. Rather than replacing these items in kind, DBOC has proposed to construct or install the following:
  - A new wooden floating dock (12 feet by 32 feet)
  - A new concrete work platform (approximately 55 feet by 24 feet)
  - New wooden ramps to connect the dock and work platform
  - A new conveyor
  - A washing system



## **ALTERNATIVE B: ISSUE NEW SPECIAL USE PERMIT—EXISTING ONSHORE FACILITIES AND INFRASTRUCTURE AND OFFSHORE OPERATIONS WOULD BE ALLOWED FOR A PERIOD OF 10 YEARS**

Alternative B considers a level of use consistent with conditions that were present in fall 2010 when NPS initiated evaluation under the EIS. The existing SUP and RUO expire on November 30, 2012. The Secretary would exercise the discretion granted to him under section 124 to issue a new 10-year SUP to DBOC, expiring November 30, 2022. Figures ES-7 and ES-8 illustrate the offshore and onshore conditions under this alternative. Specifically, under alternative B:

- Onshore facilities and infrastructure, including previously unpermitted infrastructure, would remain. This would be generally consistent with what is currently present on the site.
- The total acreage of the SUP area, both onshore and offshore, would be approximately 1,083 acres.
- With the exception of slight reductions to Bed 17 (which currently extends into the seal protection area), consistent with DBOC's requests, all existing shellfish growing areas would be included in the SUP area and would remain.
- Mariculture activities, including boat operations, would only take place within the established SUP area.
- Shellfish production would not exceed 600,000 pounds annually (inclusive of all harvested species). This level of production is consistent with the 2010 DBOC harvest.
- Pacific oysters, European flat oysters, and Manila clams could be cultivated on documented shellfish growing areas within the main permit area, Area 1 (currently known as Lease M-438-01). Purple-hinged rock scallops could only be grown in the existing 1-acre plot, Permit Area 2 (currently known as Lease M-438-02).
- DBOC would be required to pay the United States fair market value for the use of federal property, which includes onshore and offshore areas within the permit boundaries, as mandated by section 124.
- NPS would evaluate future requests regarding operational and infrastructure changes from DBOC for consistency with the intent of this alternative, which is to maintain existing conditions and levels of production.
- By November 30, 2022, DBOC would be required to remove certain buildings and structures and all of its personal property and to undertake steps to restore the area to good order and condition.



## Drakes Bay Oyster Company Special Use Permit Environmental Impact Statement

FIGURE ES-7

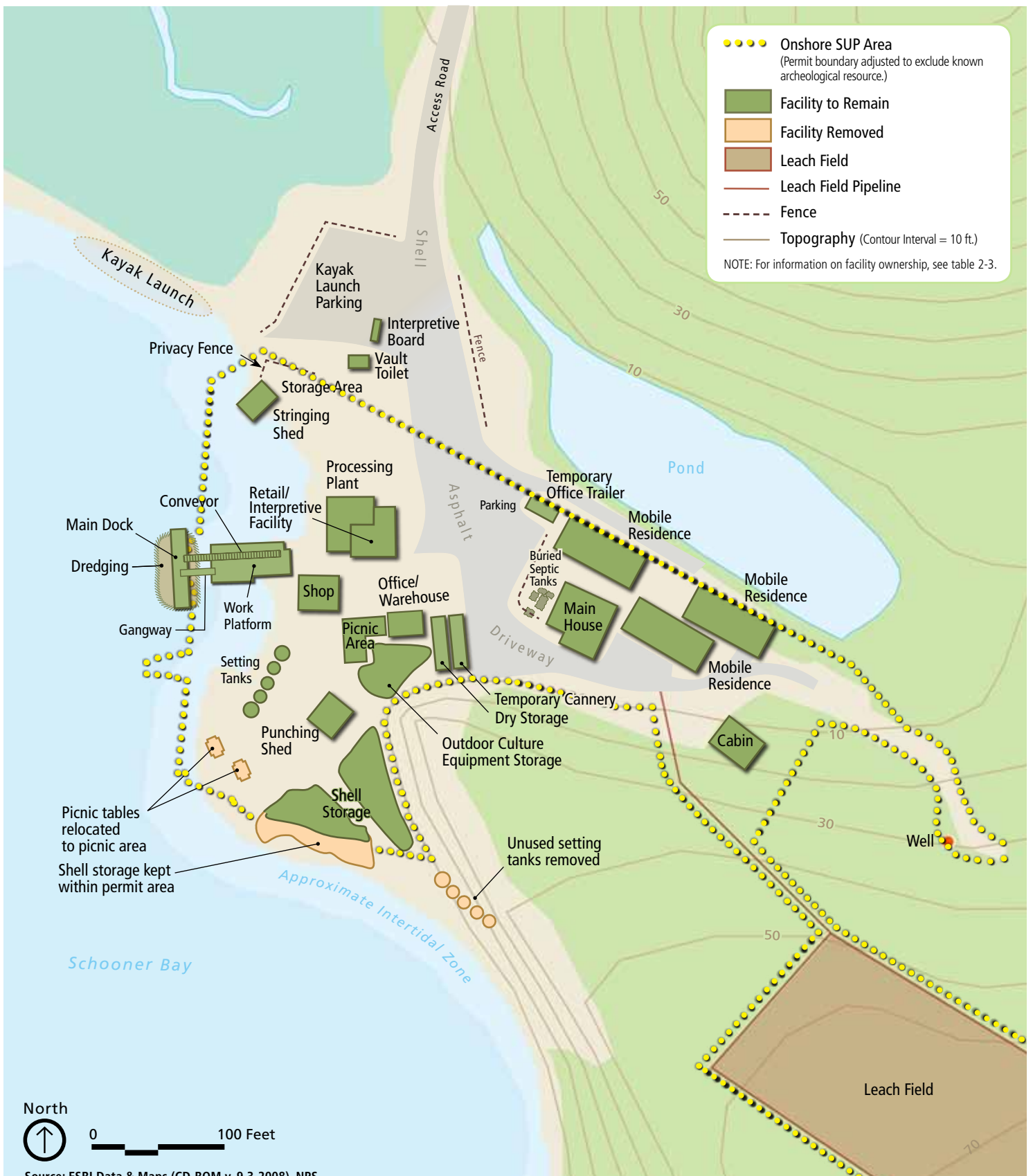
Alternative B: Issue New Special Use Permit – Existing Onshore Facilities and Infrastructure and Offshore Operations Would be Allowed for a Period of 10 Years (Offshore Operations)



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## Drakes Bay Oyster Company Special Use Permit Environmental Impact Statement

### FIGURE ES-8

**Alternative B: Issue New Special Use Permit – Existing Onshore Facilities and Infrastructure and Offshore Operations Would be Allowed for a Period of 10 Years (Onshore Operations)**



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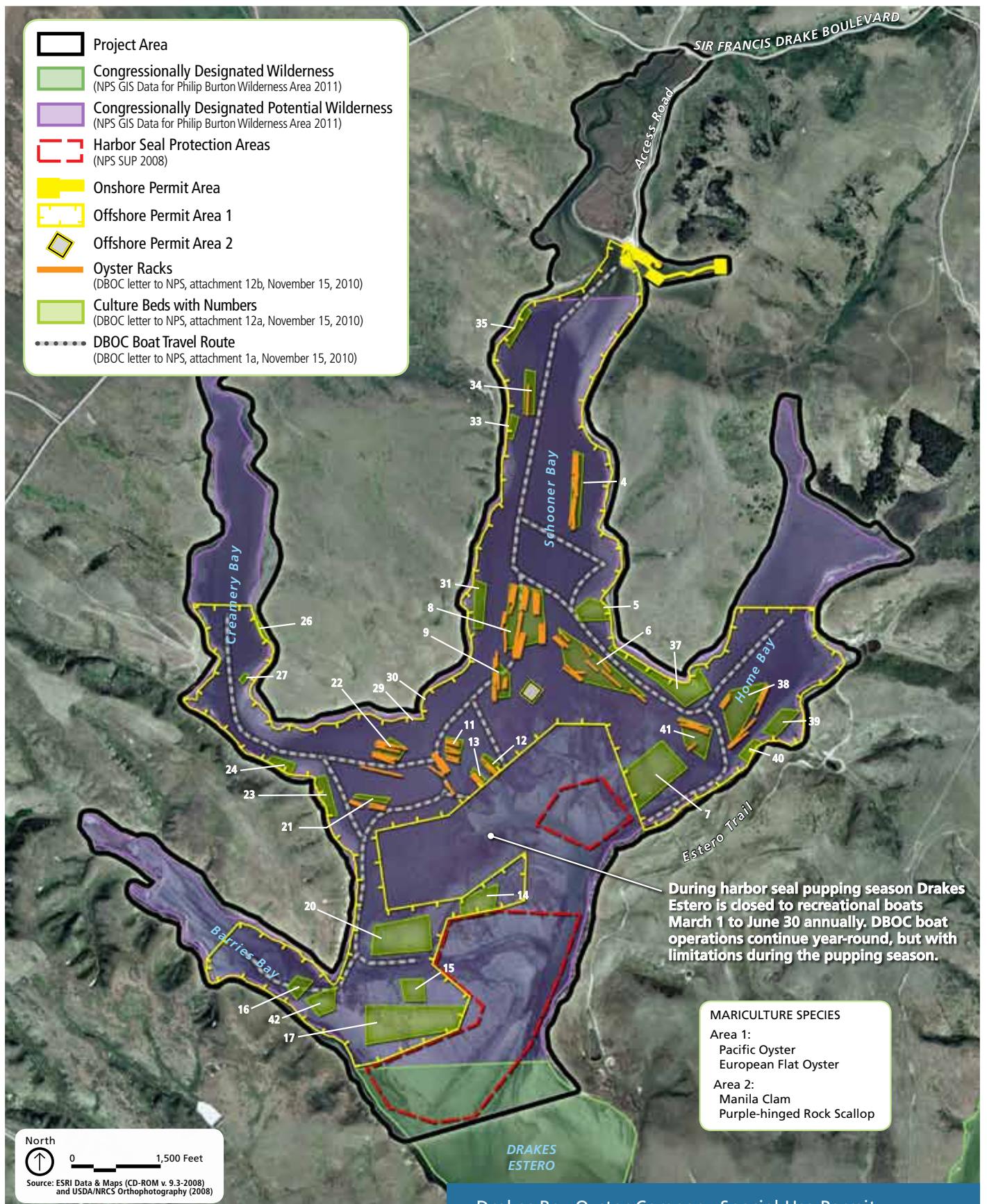
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## **ALTERNATIVE C: ISSUE NEW SPECIAL USE PERMIT—ONSHORE FACILITIES AND INFRASTRUCTURE AND OFFSHORE OPERATIONS PRESENT IN 2008 WOULD BE ALLOWED FOR A PERIOD OF 10 YEARS**

Alternative C considers a level of use that is consistent with the conditions and operations that existed at the time the current SUP was signed in April 2008. The existing SUP and RUO expire on November 30, 2012. Under Alternative C, the Secretary would exercise the discretion granted to him under section 124 to issue a new 10-year SUP to DBOC, expiring November 30, 2022. Figures ES-9 and ES-10 illustrate the offshore and onshore conditions under this alternative. Specifically, under alternative C:

- In contrast to alternative B, onshore infrastructure would be slightly reduced by removing unpermitted and nonessential facilities.
- The total acreage of the SUP area, including both offshore and onshore areas, would be approximately 901 acres. Those acres not included in the permit area under this alternative are not currently available for production due to state water quality harvest prohibitions.
- Mariculture activities, including boat operations, would only take place within the established SUP area.
- With the exception of slight reductions to Bed 17 (which currently extends into the seal protection area), consistent with DBOC's requests, all existing shellfish growing areas would be included in the SUP area and would remain.
- Shellfish production would not exceed 500,000 pounds annually (inclusive of all harvested species). This represents an approximately 10 percent increase above the average annual DBOC production for the period 2007 to 2009, which was approximately 450,000 pounds per year.
- Pacific oysters and European flat oysters could be grown on documented shellfish growing areas within the main offshore permit area, Area 1 (currently known as Lease M-438-01). Manila clams and purple-hinged rock scallops could only be cultivated in the existing 1-acre plot, Area 2 (currently known as Lease M-438-02).
- DBOC would be required to pay the U. S. fair market value for the use of federal property, which includes onshore and offshore areas within the permit boundaries, as mandated by section 124.
- NPS would evaluate future requests for operational and infrastructure changes from DBOC taking into consideration consistency of the proposed changes with 2008 conditions and levels of production.
- By November 30, 2022, DBOC would be required to remove certain buildings and structures, and all of its personal property, and undertake steps to restore the area to good order and condition.





## Drakes Bay Oyster Company Special Use Permit Environmental Impact Statement

FIGURE ES-9

Alternative C: Issue New Special Use Permit – Onshore Facilities and Infrastructure and Offshore Operations Present in 2008 Would be Allowed for a Period of 10 Years (Offshore Operations)



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## Drakes Bay Oyster Company Special Use Permit Environmental Impact Statement

### FIGURE ES-10

**Alternative C : Issue New Special Use Permit – Onshore Facilities and Infrastructure and Offshore Operations Present in 2008 Would be Allowed for a Period of 10 Years (Onshore Operations)**



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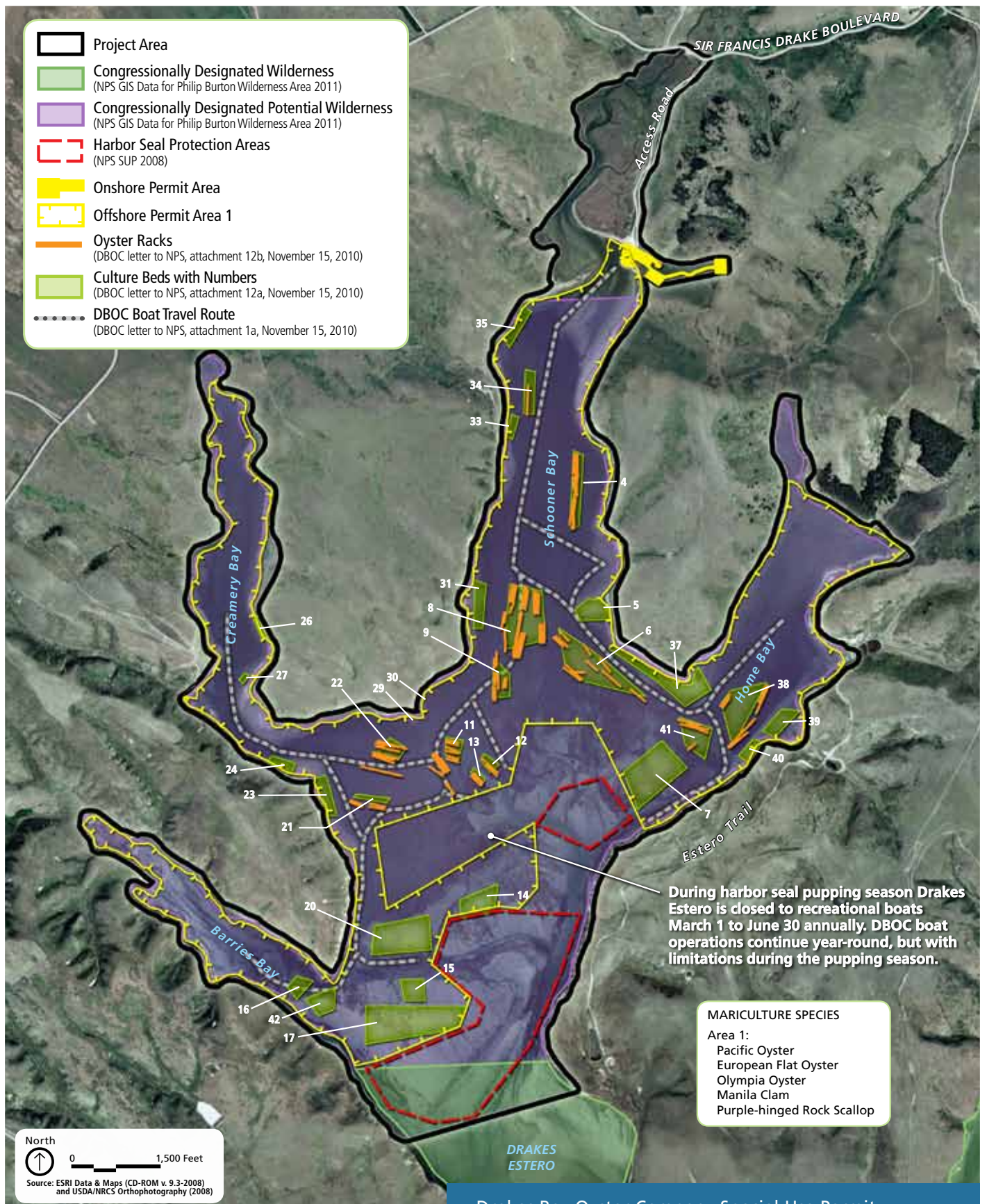
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## **ALTERNATIVE D: ISSUE NEW SPECIAL USE PERMIT—EXPANDED ONSHORE DEVELOPMENT AND OFFSHORE OPERATIONS WOULD BE ALLOWED FOR A PERIOD OF 10 YEARS**

Alternative D considers expansion of operations and development of new infrastructure as requested by DBOC as part of the EIS process. The existing SUP and RUO expire on November 30, 2012. Under alternative D, the Secretary would exercise the discretion granted to him under section 124 to issue a new 10-year SUP to DBOC, expiring November 30, 2022. Figures ES-11, ES-12, and ES-13 illustrate the offshore and onshore conditions under this alternative. Specifically, under alternative D:

- Two development proposals submitted by DBOC are evaluated at the conceptual level in this EIS. Additional planning, design, environmental compliance (including NEPA), and approval would be required prior to proceeding with construction of proposed new facilities.
- The total acreage of the SUP area, including both offshore and onshore areas, would be approximately 1,087 acres, which incorporates the boundary adjustment requested by DBOC.
- With the exception of slight reductions to Bed 17 (which currently extends into the seal protection area), consistent with DBOC's requests, all existing shellfish growing areas would be included in the SUP area and would remain.
- Mariculture activities, including boat operations, would only take place within the established SUP area.
- Shellfish production would not exceed 850,000 pounds annually (inclusive of all harvested species). This production level is based on DBOC's projections of maximum production levels (submitted to CCC).
- Pacific oysters, European flat oysters, Manila clams, Olympia oysters, and purple-hinged rock scallops could be cultivated in documented shellfish growing areas within the offshore permit area. The 1-acre plot, currently known as Lease M-438-02, would not be maintained as a distinct shellfish growing area.
- DBOC would be required to pay the United States fair market value for the use of federal property, which includes onshore and offshore areas within the permit boundaries, as mandated by section 124.
- NPS would evaluate future requests from DBOC for consistency with the intent of this alternative, which is to allow for expanded operations within the scope of the conceptual proposal; approval/compliance for future development would be through a tiered planning process.
- By November 30, 2022, DBOC would be responsible for the removal of all infrastructure developed under this alternative, as well as all personal property. DBOC would be required to restore the area to good order and condition.



## Drakes Bay Oyster Company Special Use Permit Environmental Impact Statement

FIGURE ES-11

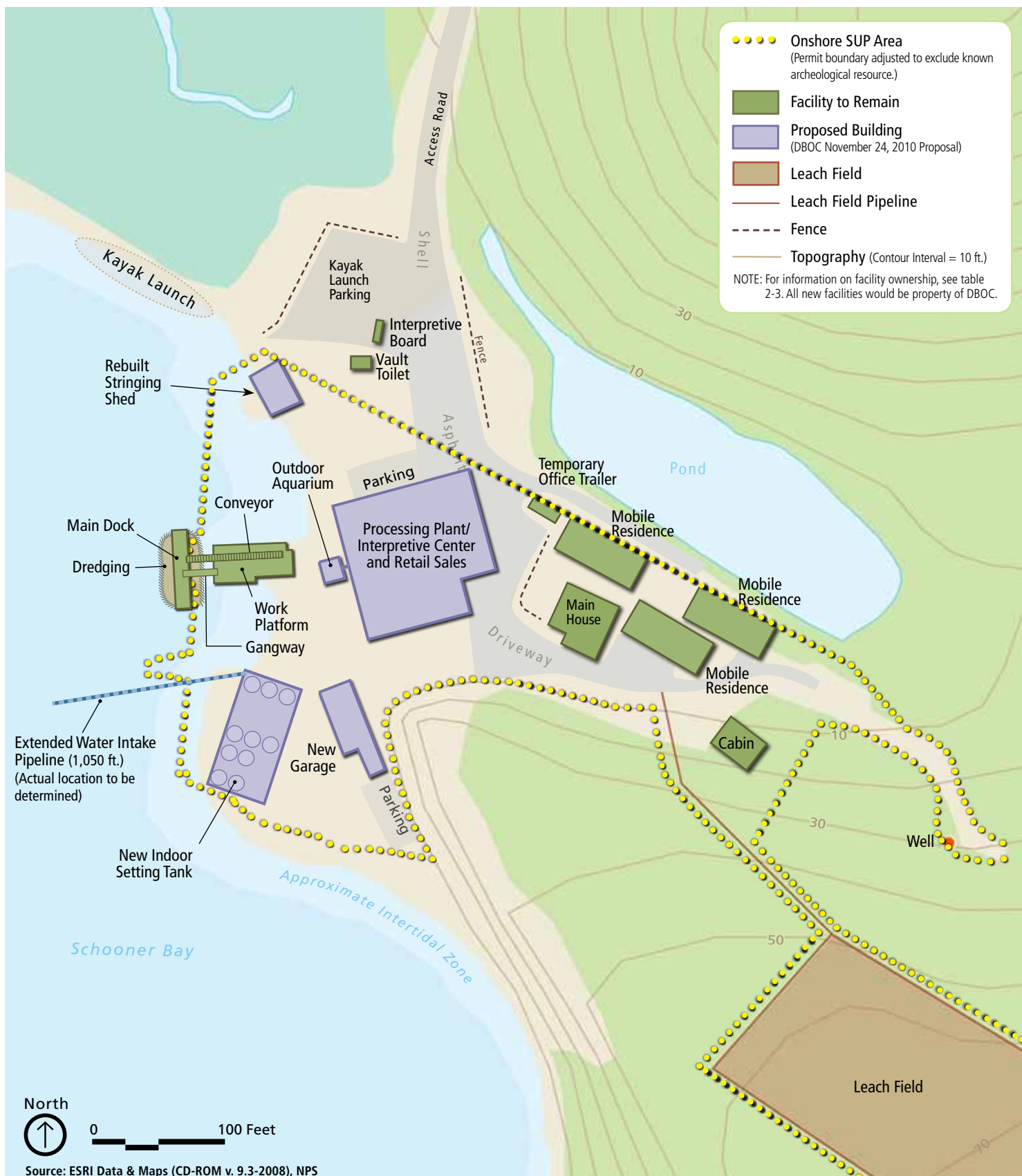
**Alternative D: Issue New Special Use Permit – Expanded Onshore Development and Offshore Operations Would be Allowed for a Period of 10 Years (Offshore Operations)**



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## Drakes Bay Oyster Company Special Use Permit Environmental Impact Statement

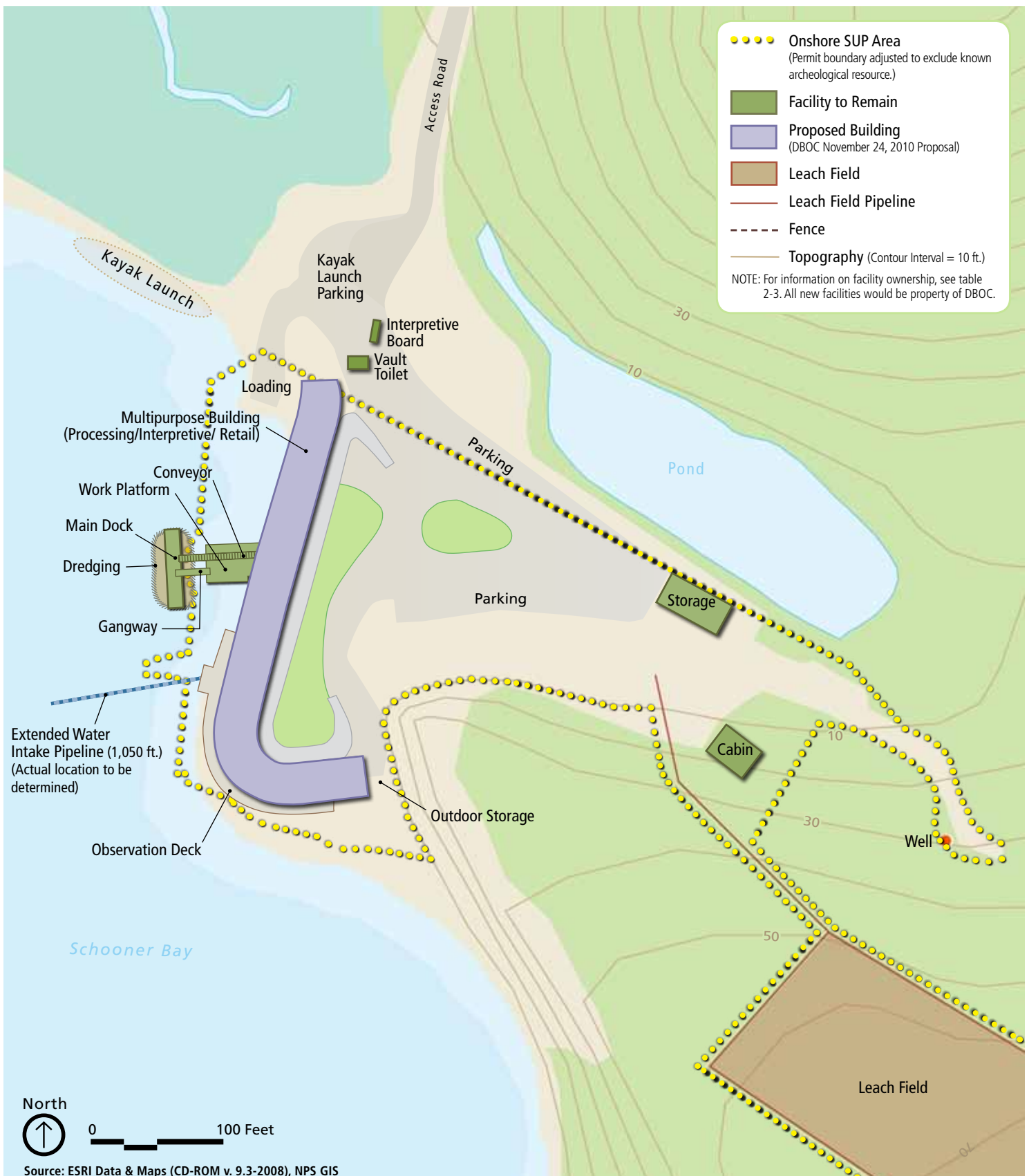
FIGURE ES-12

**Alternative D: Issue New Special Use Permit – Expanded Onshore Development and Offshore Operations Would be Allowed for a Period of 10 Years (Onshore Operations – Option 1)**



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## Drakes Bay Oyster Company Special Use Permit Environmental Impact Statement

FIGURE ES-13

**Alternative D: Issue New Special Use Permit – Expanded Onshore Development and Offshore Operations Would be Allowed for a Period of 10 Years (Onshore Operations – Option 2)**



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## SUMMARY OF THE ALTERNATIVES

Table 2-5 provides a summary of the alternatives presented above.

TABLE 2-5. SUMMARY OF ALTERNATIVES

	Alternative A: No New Special Use Permit—Conversion to Wilderness (No-action)	Alternative B: Issue New Special Use Permit—Existing Onshore Facilities and Infrastructure and Offshore Operations Would Be Allowed for a Period of 10 Years	Alternative C: Issue New Special Use Permit—Onshore Facilities and Infrastructure and Offshore Operations Present in 2008 Would Be Allowed for a Period of 10 Years	Alternative D: Issue New Special Use Permit—Expanded Onshore Development and Offshore Operations Would Be Allowed for a Period of 10 Years
New SUP	Existing authorizations expire on November 30, 2012. No new SUP for DBOC operations would be issued.	A new SUP for DBOC operations would be issued, expiring on November 30, 2022.	Same as alternative B.	Same as alternative B.
Mariculture Species	N/A	Area 1 (1,077 acres): <ul style="list-style-type: none"> <li>▪ Pacific oysters</li> <li>▪ European flat oyster</li> <li>▪ Manila clams<sup>a</sup></li> </ul> Area 2 (1.0 acre): <ul style="list-style-type: none"> <li>▪ Purple-hinged rock scallops</li> </ul>	Area 1 (896 acres): <ul style="list-style-type: none"> <li>▪ Pacific oysters</li> <li>▪ European flat oyster</li> </ul> Area 2 (1.0 acre): <ul style="list-style-type: none"> <li>▪ Purple-hinged rock scallops</li> <li>▪ Manila clams</li> </ul>	Area 1 (1,082 acres): <ul style="list-style-type: none"> <li>▪ Pacific oysters</li> <li>▪ European flat oyster</li> <li>▪ Olympia oysters</li> <li>▪ Manila clams</li> <li>▪ Purple-hinged rock scallops</li> </ul> Area 2 would be removed.
Acquisition of Larvae and Seed	N/A	All imported.	All imported.	Pacific oysters and Manila clams imported. Olympia oysters and purple-hinged rock scallops collected on site.
Culture Methods	N/A	<ul style="list-style-type: none"> <li>▪ Japanese hanging culture</li> <li>▪ French tube culture</li> <li>▪ Bottom bags</li> <li>▪ Floating bags</li> <li>▪ Floating trays</li> </ul>	Same as alternative B.	Same as alternative B.
Production Limits	N/A	600,000 pounds of shellfish per year.	500,000 pounds of shellfish per year.	850,000 pounds of shellfish per year.

<sup>a</sup> Items have not previously been permitted by NPS

N/A = not applicable

TABLE 2-5. SUMMARY OF ALTERNATIVES (CONTINUED)

	Alternative A	Alternative B	Alternative C	Alternative D
Offshore Permit Boundaries	N/A	<p>Offshore SUP boundaries would be based on existing leases, with two adjustments to Area 1: (1) The two parcels would be joined in Schooner Bay to allow boats to use the main channel and (2) areas within harbor seal protection areas would be excluded.</p> <p>Area 2 would be maintained for cultivation of purple-hinged rock scallops.</p> <p>Offshore permit area would include 1,078 acres.</p>	<p>Area 1 would be the same as alternative B except the southeast boundary of alternative C would follow either the harbor seal protection area boundary or the proposed DBOC shellfish growing area boundary, whichever is more protective of established harbor seal haul-out areas.</p> <p>Area 2 would be maintained for cultivation of Manila clams and purple-hinged rock scallops.</p> <p>Offshore permit area would include 897 acres.</p>	<p>Offshore SUP boundaries would be based on DBOC's proposed adjustment of the shellfish growing area boundary, with the same two adjustments noted under alternative B.</p> <p>Area 2 would not be maintained as a separate growing area.</p> <p>Offshore permit area would include 1,082 acres.</p>
Offshore Infrastructure	All aquaculture materials, including racks, bags, and other materials would be removed from Drakes Estero as part of closeout activities. Approximately 179,000 linear feet of pressure treated lumber would be removed in addition to removal of remaining culture material.	Ongoing maintenance of racks, assuming 5 percent replacement or repair annually, may include repair or replacement of approximately 1,285 feet of rack and 8,900 feet of lumber per year.	Same as Alternative B	Same as Alternative B
Vessel Transit Plan	N/A	A vessel transit plan for DBOC boat use within Drakes Estero would be developed and submitted to NPS for approval.	Same as alternative B.	Same as alternative B.

N/A = not applicable



TABLE 2-5. SUMMARY OF ALTERNATIVES (CONTINUED)

	Alternative A	Alternative B	Alternative C	Alternative D
DBOC Boat Operations	Use of motorized boats in Drakes Estero would cease.	Two motorboats and two nonmotorized barges would be operated in Drakes Estero, approximately 12 trips per day, 8 hours a day, combined.	Same as alternative B.	Same as alternative B, except boat operations may increase due to increased production limits.
Harbor Seal Protection Protocol	N/A	The existing protocol would be included in the new SUP, including seasonal closure of lateral channel and maintenance of a 100-yard buffer from any hauled-out harbor seal at any location and time by DBOC boats and staff.	Same as alternative B.	Same as alternative B.
Onshore Permit Boundaries	N/A	Onshore SUP boundaries would be based on existing NPS authorizations, excluding a known archeological resource.  Onshore permit area would total 4.3 acres, including the areas used for water and septic utilities.	Same as alternative B.	Same as alternative B.
DBOC Onshore Facilities: Staff Housing	The main house and cabin would remain as NPS property following SUP expiration. DBOC would be responsible for removing mobile homes following expiration of the SUP.	On-site housing would be provided for DBOC staff in 2 permanent houses and 3 mobile homes, providing a total of 14 bedrooms.	Same as alternative B.	The level of staff housing that would be provided under this alternative has not been determined.
DBOC Onshore Facilities: Picnic Area	Picnic tables and associated materials are considered personal property and would be removed by DBOC upon expiration of the SUP.	A dozen picnic benches would be provided for DBOC visitors within the permit area. <sup>a</sup>	No picnic area would be provided at DBOC. NPS would provide tables outside the permit area.	A picnic area may be provided in some form.

N/A = not applicable

TABLE 2-5. SUMMARY OF ALTERNATIVES (CONTINUED)

	Alternative A	Alternative B	Alternative C	Alternative D
DBOC Onshore Facilities: Processing Plant	DBOC would remove private property within the building. This building is NPS property and would remain on site.	The existing single-story processing plant would continue to house shellfish processing, retail, and interpretive facilities at the existing scale.	Same as alternative B.	The existing processing plant would be removed and replaced in some form by a larger building.
DBOC Onshore Facilities: Cannery	This temporary structure was placed by DBOC and would be removed following SUP expiration.	The cannery would continue to be housed in the existing shipping container. <sup>a</sup>	Same as alternative B.	The temporary cannery container would be removed and this function served within the new larger processing plant.
DBOC Onshore Facilities: Setting Tanks	These structures are considered personal property. DBOC would be responsible for removal following the expiration of the SUP.	Seeding would take place in the existing tanks (indoor and outdoor <sup>a</sup> ).	Same as alternative B.	A new seeding plant may be constructed to replace the existing facilities.
Wilderness Status	Following removal of nonconforming uses in Drakes Estero, the congressionally designated potential wilderness would be converted to congressionally designated wilderness in 2012.	A new SUP would be issued for DBOC operations until November 30, 2022. This would delay conversion of congressionally designated potential wilderness to congressionally designated wilderness for 10 years.	Same as alternative B.	Same as alternative B.
Other NPS Operations and Facilities	The existing access road, parking lot, interpretive board, and vault toilet would be maintained. NPS also would install a gate to limit recreational access to Drakes Estero during harbor seal pupping season.	Same as alternative A, without the addition of the gate.	Same as alternative A, without the addition of the gate.	Same as alternative A, without the addition of the gate.

<sup>a</sup> Items have not previously been permitted by NPS

## ENVIRONMENTAL CONSEQUENCES

Impacts of the alternatives were assessed in accordance with NPS Director's Order 12 and Handbook: *Conservation Planning, Environmental Impact Analysis and Decision-Making* (NPS 2001b). The summary of environmental consequences considers the actions being proposed and relevant cumulative impacts. The potential environmental consequences of the actions are addressed for wetlands, eelgrass, wildlife and wildlife habitat (benthic fauna, fish, harbor seals, and birds), special-status species, coastal flood zones, water quality, soundscapes, wilderness, visitor experience and recreation, socioeconomic resources, and NPS operations.

For each impact topic, methods were identified to measure the change in the Seashore's resources that would occur with implementation of each of the action alternatives. Intensity definitions were established for each impact topic to help understand the severity and magnitude of changes in resource conditions, both adverse and beneficial.

Each action alternative was compared to existing conditions to determine the context, duration, and intensity of impacts on each resource. Existing conditions relative to each impact topic are described in chapter 3 of the EIS. The environmental consequences associated with each alternative, discussed according to impact topic, are summarized in table ES-4 below, and are detailed in chapter 4 of the EIS.

TABLE ES-4. SUMMARY OF ENVIRONMENTAL CONSEQUENCES

Alternative A	Alternative B	Alternative C	Alternative D
Action/Impact	Action/Impact	Action/Impact	Action/Impact
<b>Wetlands</b>			
<p>Overall, alternative A would result in long-term beneficial impacts on wetlands within the project area. No wetlands would be permanently lost. The removal of personal property would increase the potential that the project area could be converted back to historic wetland habitat. Specifically, the removal of approximately 5 linear miles of racks and up to 88 acres of bags from nonvegetated sandbars and mudflats in Drakes Estero would allow benthic organisms in Drakes Estero to recolonize the space previously occupied by the bags. Additionally, erosive forces on sediments caused by tidal water flowing across and around bags would be eliminated, restoring natural hydrodynamics in up to 88 acres of sandbars and mudflats available for use by DBOC. Further, removal of the bags, racks, and other shellfish cultivation equipment from up to 142 acres of Drakes Estero would also reduce the potential for introduction and spread of invasive species such as the nonnative tunicate <i>Didemnum</i>. Reduction in propeller-caused turbidity in the water column also would result in increased sunlight penetration and therefore increased primary production. Removal of racks would result in short-term minor adverse impacts on wetlands because of a temporary increase in turbidity during removal of onshore structures, approximately 4,700 posts (2-inch by 6-inch boards) from the sediment within Drakes Estero, and up to 88 acres of bottom bags. This increase in turbidity would be highly localized and would last approximately one to two months. The cumulative impact would be long-term beneficial, and alternative A would contribute an appreciable beneficial increment to the cumulative impact.</p>	<p>During the life of the 10-year permit, impacts on wetlands under alternative B would be short-term minor adverse and long-term moderate adverse. Within the 138 acres of documented shellfish growing beds, actions associated with the placement of bottom bags on up to 84 acres of tidal mudflats/sandbars would continue under alternative B. Bottom bags have been placed in approximately 22 acres of mudflats and sandbars each of the past two years. Other impacts include pulse disturbances to mudflats and sandbars from the placement and rotation of bags/trays, DBOC staff walking across the mudflats/sandbars, and boat propellers and hulls scraping the bottom sediment. Onshore operations may cause a minor decrease in wetland functions and values from refuse and runoff along the shoreline if not collected and hauled offsite. No wetlands would be permanently converted to uplands under this alternative; however, impacts would be clearly detectable and could appreciably affect individuals or groups of species, communities, or natural processes for an additional 10 years. Temporary impacts would be associated with dredging under the new dock. Dredging would occur within a 30- by 60-foot area at the dock, resulting in a local short-term minor adverse impact on the silted bottom of Drakes Estero, with impacts expected to last one week due to a localized increase in sedimentation. The cumulative impact would be long-term moderate adverse, and alternative B would contribute an appreciable adverse increment to the cumulative impact.</p> <p>By obtaining state and federal permits, alternative B would be consistent with relevant law and policy related to management of wetlands. DBOC's</p>	<p>During the life of the 10-year permit, impacts on wetlands under alternative C would be short-term minor adverse and long-term moderate adverse. Actions associated with the placement of bottom bags on up to 84 acres of tidal mudflats/sandbars would continue under alternative C. Of the 138 acres available for use, bottom bags have been placed in approximately 22 acres of mudflats/sandbars each of the past two years and could be placed in up to 84 acres in Drakes Estero. Other impacts include pulse disturbances to mudflats/sandbars from the placement and rotation of bags/trays, DBOC staff walking across the mudflats/sandbars, and boat propellers and hulls scraping the bottom sediment. As under alternative B, onshore operations may cause a minor decrease in wetland functions and values from refuse and runoff along the shoreline if not collected and hauled offsite. No wetlands would be permanently converted to uplands under this alternative; however, impacts would be clearly detectable and could appreciably affect individuals or groups of species, communities, or natural processes for an additional 10 years. Temporary impacts would be associated with dredging under the new dock within a 30- by 60-foot area at the dock, resulting in a local short-term minor adverse impact on the silted bottom of Drakes Estero, with impacts expected to last one week due to a localized increase in sedimentation. The cumulative impact would be long-term moderate adverse, and alternative C would contribute an appreciable adverse increment to the cumulative impact.</p> <p>By obtaining relevant state and federal permits, alternative C would be consistent with relevant law and policy related to management of</p>	<p>During the life of the 10-year permit, impacts on wetlands under alternative D would be short-term minor adverse and long-term moderate adverse. Actions associated with the placement of bottom bags on up to 84 acres of tidal mudflats/sandbars would continue under alternative D. Of the 138 acres available for use, bottom bags have been placed in approximately 22 acres of mudflats/sandbars each of the past two years and could be placed in up to 84 acres in Drakes Estero. Other impacts include pulse disturbances to mudflats/sandbars from the placement and rotation of bags/trays, DBOC staff walking across the mudflats/sandbars, and boat propellers and hulls scraping the mud bottom. Because of the potential for higher production under this alternative (approximately 40 percent greater than alternative B and 70 percent greater than alternative C), the impacts associated with these actions would likely be greater than alternative B or C, but are still expected to be at a moderate level. As under alternatives B and C, onshore operations may cause a minor decrease in wetland functions and values from refuse and runoff along the shoreline if not collected and hauled offsite. No wetlands would be permanently converted to uplands under this alternative; however, impacts would be clearly detectable and could appreciably affect individuals or groups of species, communities, or natural processes for an additional 10 years. Temporary impacts would be associated with dredging under the new dock (30- by 60-foot area), placement of a new 1,050-foot intake pipe along the bottom of Drakes Estero, and construction of a new processing facility. These actions are expected to result in short-term, minor adverse impacts due to an increase in local turbidity levels. The cumulative impact</p>

TABLE ES-4. SUMMARY OF ENVIRONMENTAL CONSEQUENCES (CONTINUED)

Alternative A	Alternative B	Alternative C	Alternative D
Action/Impact	Action/Impact	Action/Impact	Action/Impact
<p>With respect to wetlands, alternative A is consistent with relevant law and policy. The natural recovery of wetlands would be consistent with NPS <i>Management Policies 2006</i> and DO-77-1, which sets a goal of a "net gain" of wetlands (NPS 2006d, 2002a). USACE would be consulted to determine whether or not removal of commercial shellfish infrastructure would require permitting.</p>	<p>commercial shellfish operations and any dredge or fill activities within the waters of the United States (including Drakes Estero and the pond behind the mobile homes) are subject to permitting by USACE. Dredging the area around the dock would require USACE permit authorization. In a letter to NPS dated November 16, 2010, USACE stated:</p> <p>"The aquaculture activities are within our jurisdiction and a permit is required. Review of our files indicates that the Drakes Bay Oyster Company aquaculture operation does not have a current permit application or permit on file. The Corps advises that the Drakes Bay Oyster Company submit a permit application to ensure their activities comply with our regulations. Application for Corps authorization should be made to this office." (USACE 2010)</p> <p>The letter goes on to note that, if an individual permit is required, DBOC will need to "demonstrate to the Corps that any proposed fill is necessary because there are no practicable alternatives, as outlined in the U.S. Environmental Protection Agency's Section 404(b)(1) Guidelines" (USACE 2010).</p> <p>Lastly, any future actions would be reviewed by NPS under DO-77-1; however, minor water-dependent actions (such as the installation of the new dock) are likely to be excepted from a statement of findings (per section 4.2.1 of NPS Procedural Manual 77-1; NPS 2002a).</p>	<p>wetlands. DBOC's commercial shellfish operations and any dredge or fill activities within the waters of the United States (including Drakes Estero and the pond behind the mobile homes) are subject to permitting by USACE. Dredging the area around the dock would require USACE permit authorization. In a letter to NPS dated November 16, 2010, USACE stated:</p> <p>"The aquaculture activities are within our jurisdiction and a permit is required. Review of our files indicates that the Drakes Bay Oyster Company aquaculture operation does not have a current permit application or permit on file. The Corps advises that the Drakes Bay Oyster Company submit a permit application to ensure their activities comply with our regulations. Application for Corps authorization should be made to this office." (USACE 2010)</p> <p>The letter goes on to note that, if an individual permit is required, DBOC will need to "demonstrate to the Corps that any proposed fill is necessary because there are no practicable alternatives, as outlined in the U.S. Environmental Protection Agency's Section 404(b)(1) Guidelines" (USACE 2010).</p> <p>Lastly, any future actions would be reviewed by the NPS under DO-77-1; however, minor water-dependent actions (such as the installation of the new dock) are likely to be excepted from a statement of findings (per section 4.2.1 of NPS Procedural Manual 77-1; NPS 2002a).</p>	<p>would be long-term moderate adverse, and alternative D would contribute an appreciable adverse increment to the overall cumulative impact.</p> <p>By obtaining relevant state and federal permits, alternative D would be consistent with relevant law and policy related to management of wetlands. DBOC's commercial shellfish operations and any dredge or fill activities within the waters of the United States (including Drakes Estero and the pond behind the mobile homes) are subject to permitting by USACE. Installation of the intake pipe and dredging the area around the dock would require USACE permit authorization. In a letter to NPS dated November 16, 2010, USACE stated:</p> <p>"The aquaculture activities are within our jurisdiction and a permit is required. Review of our files indicates that the Drakes Bay Oyster Company aquaculture operation does not have a current permit application or permit on file. The Corps advises that the Drakes Bay Oyster Company submit a permit application to ensure their activities comply with our regulations. Application for Corps authorization should be made to this office." (USACE 2010)</p> <p>The letter goes on to note that, if an individual permit is required, DBOC will need to "demonstrate to the Corps that any proposed fill is necessary because there are no practicable alternatives, as outlined in the U.S. Environmental Protection Agency's Section 404(b)(1) Guidelines"</p>

TABLE ES-4. SUMMARY OF ENVIRONMENTAL CONSEQUENCES (CONTINUED)

Alternative A	Alternative B	Alternative C	Alternative D
Action/Impact	Action/Impact	Action/Impact	Action/Impact
			(USACE 2010). Lastly, any future actions would be reviewed by the NPS under DO-77-1; however, minor water-dependent actions (such as the installation of the new dock and placement of the water intake line) are likely to be excepted from a statement of findings (per section 4.2.1 of NPS Procedural Manual 77-1; NPS 2002a).
<b>Eelgrass</b>			
<p>Overall, alternative A would result in long-term beneficial impacts on eelgrass habitat due to the termination of DBOC operations within Drakes Estero, as well as the removal of structures that currently inhibit eelgrass abundance and serve as potential points of introduction and added substrate for expansion of invasive species (e.g., tunicates) and epiphytic algae. There may be some highly localized adverse impacts on eelgrass associated with removal of the commercially grown shellfish because they provide some benefits associated with nutrient cycling and water filtration; however, the overall long-term impacts of alternative A on eelgrass would be beneficial. Alternative A also would result in short-term minor adverse impacts because removal of mariculture infrastructure would result in localized increases in sedimentation that would last less than two months. The cumulative impact would be long-term beneficial, and alternative A would contribute an appreciable beneficial increment to the overall cumulative impact.</p> <p>With respect to eelgrass, alternative A is consistent with relevant law and policy because it would preserve and enhance (1) a special aquatic site, a category of waters of the United States afforded additional consideration under the CWA,</p>	<p>Overall, alternative B would result in long-term moderate adverse impacts on eelgrass in Drakes Estero due to the operation of DBOC boats for another 10 years and the continued presence of commercial shellfish infrastructure within Drakes Estero. DBOC activities in Drakes Estero under alternative B would allow the continuation of actions associated with commercial shellfish operations that could damage eelgrass habitat, such as propeller scarring (estimated at 8.5 miles based on 2010 aerial photography), boat wake erosion, and temporary increases in turbidity from sediment resuspension given the area of boat operations within Drakes Estero. It is anticipated that the amount of scarring under alternative B would remain similar to that observed in the 2010 aerial photographs. Further, the continuation of DBOC activities would increase the potential for shellfish mariculture-related introductions of nonnative species (e.g., colonial tunicates) and epiphytic algae, which would have a long-term adverse impact on eelgrass. Maintenance of offshore infrastructure would continue to preclude eelgrass colonization underneath the beds and approximately 7 acres of racks. Beneficial ecosystem effects typically attributed to bivalves, such as nutrient cycling and water clarity, would continue, but these beneficial impacts would be expected to be relatively small in a west coast estuary like Drakes Estero due to high sediment-</p>	<p>Overall, alternative C would result in long-term moderate adverse impacts on eelgrass in Drakes Estero due to the operation of DBOC boats for an additional 10 years and the continued presence of shellfish infrastructure within Drakes Estero. DBOC activities in Drakes Estero under alternative C would allow the continuation of actions associated with commercial shellfish operations that could damage eelgrass habitat, such as propeller scarring (estimated at 8.5 miles based on 2010 aerial photography), boat wake erosion, and temporary increases in turbidity from sediment resuspension given the area of boat operations within Drakes Estero. It is anticipated that because the level of boat use would remain similar, the amount of scarring under alternative C would remain similar to that observed in the 2010 aerial photographs. Further, the continuation of DBOC activities would increase the potential for shellfish mariculture-related introductions of nonnative species (e.g., colonial tunicates) and epiphytic algae. Maintenance of offshore infrastructure would continue to preclude eelgrass colonization underneath the beds and approximately 7 acres of racks. Beneficial ecosystem effects typically attributed to bivalves, such as nutrient cycling and water clarity, would continue, but these beneficial impacts would be expected to be relatively small in a west coast estuary like Drakes Estero due to</p>	<p>Overall, alternative D would result in long-term moderate adverse impacts on eelgrass in Drakes Estero due to an additional 10 years of DBOC operations. DBOC activities in Drakes Estero under alternative D would allow the continuation of and potential increase in actions associated with commercial shellfish mariculture that result in damage to eelgrass habitat, such as propeller scarring (estimated at 8.5 miles based on 2010 aerial photography), boat wake erosion, and temporary increases in turbidity from sediment resuspension. It is anticipated that due to the likely increase in boat traffic and area of vessel operations that the potential for scarring may be increased from the levels observed in the 2010 aerial photography. Further, the continuation of DBOC activities would increase the potential for shellfish mariculture-related introductions of nonnative species (e.g., colonial tunicates) and epiphytic algae. Maintenance of offshore infrastructure would continue to preclude eelgrass colonization underneath the beds and racks. Beneficial ecosystem effects typically attributed to bivalves, such as nutrient cycling and water clarity, would continue, but these beneficial impacts would be expected to be relatively minor in a west coast estuary like Drakes Estero (i.e., with high sediment-nutrient content, extensive tidal flushing, and proximity to nutrient-rich upwelling zones along the Pacific coast). Finally,</p>



TABLE ES-4. SUMMARY OF ENVIRONMENTAL CONSEQUENCES (CONTINUED)

Alternative A	Alternative B	Alternative C	Alternative D
Action/Impact	Action/Impact	Action/Impact	Action/Impact
(2) essential fish habitat (habitat of particular concern) under the Groundfish Plan, and (3) native species and natural processes encouraged by NPS Management Policies 2006.	<p>nutrient content, extensive tidal flushing, and proximity to nutrient-rich upwelling zones along the Pacific coast. Finally, maintenance of oyster racks within Drakes Estero would prolong the erosional condition that is occurring under the racks. In general, impacts would be clearly detectable and could appreciably affect individuals or groups of species, communities, or natural processes. The NAS concluded that mariculture in Drakes Estero results in impacts on eelgrass from the presence of racks and from boat propeller scars, but these impacts are somewhat offset by the “rapid regeneration capacity” for eelgrass and “that eelgrass productivity can be locally enhanced by the cultured oysters through a reduction in turbidity and fertilization via nutrient regeneration” (NAS 2009). Although there are some highly localized beneficial impacts on eelgrass associated with commercial shellfish operations, the overall impact of alternative B on eelgrass would be moderate and adverse. The cumulative impact would be long-term moderate adverse, and alternative B would contribute an appreciable adverse increment to the overall cumulative impact.</p> <p>With respect to eelgrass, alternative B does not further the goals set forth in existing law and policy because it would allow ongoing adverse impacts on (1) a special aquatic site, a category of waters of the United States afforded additional consideration under the CWA, (2) essential fish habitat (habitat of particular concern) under the Groundfish Plan, and (3) native species and natural processes (including native species management) under NPS Management Policies 2006.</p>	<p>high sediment-nutrient content, extensive tidal flushing, and proximity to nutrient-rich upwelling zones along the Pacific coast. Finally, maintenance of oyster racks within Drakes Estero would prolong the erosional condition that is occurring under the racks. In general, impacts would be clearly detectable and could appreciably affect individuals or groups of species, communities, or natural processes. The NAS concluded that mariculture in Drakes Estero results in impacts on eelgrass from the presence of racks and from boat propeller scars, but these impacts are somewhat offset by the “rapid regeneration capacity” for eelgrass and “that eelgrass productivity can be locally enhanced by the cultured oysters through a reduction in turbidity and fertilization via nutrient regeneration” (NAS 2009). Although there are some highly localized beneficial impacts on eelgrass associated with shellfish operations, the impact of alternative C on eelgrass would be moderate and adverse. The cumulative impact would be long-term moderate adverse, and alternative C would contribute an appreciable adverse increment to the cumulative impact.</p> <p>With respect to eelgrass, alternative C does not further the goals set forth in existing law and policy because it would allow ongoing adverse impacts on (1) a special aquatic site, a category of waters of the United States afforded additional consideration under the CWA, (2) essential fish habitat (habitat of particular concern) under the Groundfish Plan, and (3) native species and natural processes (including native species management) under NPS Management Policies 2006.</p>	<p>maintenance of oyster racks within Drakes Estero would prolong the erosional condition that is occurring under the racks. These adverse impacts would be of greater magnitude than those associated with alternatives B and C due to the likely increase in boat traffic in Drakes Estero associated with the increased level of production (approximately 40 percent greater than alternative B and 70 percent greater than alternative C), and the increased use of bags and racks in shellfish operations, but are still expected to be of a moderate intensity. Impacts would be clearly detectable and could appreciably affect individual plants, eelgrass meadows, and natural processes (such as eelgrass colonization and/or regeneration). The cumulative impact would be long-term moderate adverse, and alternative D would contribute an appreciable adverse increment to the overall cumulative impact.</p> <p>With respect to eelgrass, alternative D does not further the goals set forth in existing law and policy because it would allow ongoing adverse impacts on (1) a special aquatic site, a category of waters of the United States afforded additional consideration under the CWA, (2) essential fish habitat (habitat of particular concern) under the Groundfish Plan, and (3) native species and natural processes (including native species management) under NPS Management Policies 2006.</p>

TABLE ES-4. SUMMARY OF ENVIRONMENTAL CONSEQUENCES (CONTINUED)

Alternative A	Alternative B	Alternative C	Alternative D
Action/Impact	Action/Impact	Action/Impact	Action/Impact
<b>Wildlife and Wildlife Habitat: Benthic Fauna</b>			
<p>Overall, alternative A would result in long-term beneficial impacts on native benthic fauna because the termination of DBOC operations and associated mariculture activities within Drakes Estero would remove nonnative species from Drakes Estero and reduce risk for the spread of nonnative and invasive species in the future. Alternative A would result in the removal of mariculture structures supporting more than 10 million oysters currently growing in Drakes Estero, as well as several hundred thousand Manila clams in bags. Although some habitat for certain benthic species would be removed when DBOC's offshore infrastructure is removed, alternative natural habitats (e.g., eelgrass beds) are expected to replace these structures. Further, the removal of structures under alternative A would also remove substrates that support invasive tunicates and other fouling species. Several native benthic species, such as bivalves, polychaete worms, and ostracods would benefit from the removal of offshore infrastructure, particularly up to 88 acres of mudflats and sandbars where bottom bags can be placed (22 acres have been planted with bottom bags each of the past two years). Such species are adapted to the soft bottom habitat and eelgrass that would likely replace the mariculture structures once they are removed. The cumulative impact would be beneficial, and alternative A would contribute an appreciable beneficial increment to the beneficial cumulative impact.</p> <p>Alternative A would be consistent with the guidance set forth in NPS Management Policies 2006 for the maintenance and restoration of natural native ecosystems, including the eradication of exotic species where these species</p>	<p>Overall, alternative B would result in long-term moderate adverse impacts on native benthic fauna due to an additional 10 years of DBOC operations and associated human activities within Drakes Estero, and the potential for such activities to serve as vectors for introduction of nonnative invasive species. Specifically, the cultivation of nonnative species within Drakes Estero at production levels of 600,000 pounds of shellfish meat annually would result in approximately 7.06 million individual organisms being added to and subsequently harvested from Drakes Estero on an annual basis. Based on DBOC proof of use reports, the acreage of sand bars and mudflats occupied at this level of production is 50 percent greater than that reported for 2008 in the 2009 NAS report. This would appreciably affect the natural benthic community, the consequences of which could include nonnative species competitively excluding native species of bivalves and other benthic organisms, introduction of molluscan diseases, and other harmful nonnative species being imported unintentionally (such as the invasive tunicate <i>Didemnum</i>). Use of both bottom bags and racks has been implicated in detectable changes in benthic communities. The maintenance and continued use of DBOC offshore infrastructure would result in a slight decrease in benthic invertebrate abundance where the racks are currently located, owing mostly to the lack of eelgrass in these areas. In addition, the continuation of bag cultivation in Drakes Estero would maintain artificial structured habitat for some benthic invertebrates, but would also allow for non-catch mortality to continue, as described above, which would have an adverse impact on native bivalves. Further, the continued use of offshore infrastructure would maintain the</p>	<p>Overall, alternative C would result in long-term moderate adverse impacts on benthic fauna due to an additional 10 years of commercial shellfish operations and associated human activities within Drakes Estero, and the potential for such activities to serve as vectors for introduction of nonnative invasive species. Specifically, production levels under alternative C (500,000 pounds of shellfish meat) would result in 5.88 million individuals being harvested from Drakes Estero annually. The cultivation of nonnative species within Drakes Estero would appreciably affect the communities of the natural benthic community, including introduction of molluscan diseases and other nonnative species imported unintentionally (such as the invasive tunicate <i>Didemnum</i>). However, the area in which Manila clams will be grown is a small area where no sandbars exist, which would limit the potential for this species to naturalize in Drakes Estero as compared with alternatives B and D. The use of both bottom bags and racks has been implicated in detectable changes in benthic communities. The slight reduction in shellfish production levels between alternative B (600,000 pounds) and alternative C (500,000 pounds) indicates that the level of impact on benthic fauna resulting from alternative C would be slightly less than that from alternative B; however, these impacts would be clearly detectable and could appreciably affect the individual species, communities, or natural processes. Cumulative impacts would be long-term moderate adverse, and alternative C would contribute an appreciable adverse increment to the overall cumulative impact.</p> <p>The introduction and maintenance of nonnative species in Drakes Estero does not further the goal</p>	<p>Overall, alternative D would result in long-term moderate adverse impacts on native benthic fauna due to an additional 10 years of DBOC operations and associated human activities within Drakes Estero, and the potential for such activities to serve as vectors for introduction of nonnative invasive species. Specifically, the increase in shellfish production levels to 850,000 pounds shucked weight (approximately 10 million individual organisms harvested annually) represents a marked increase over alternatives B and C (approximately 40 percent greater than alternative B and 70 percent greater than alternative C); therefore, it is assumed alternative D would result in the greatest level of impact on native benthic fauna among all alternatives. The cultivation of nonnative species within Drakes Estero would appreciably affect the natural benthic community, including introduction and spread of molluscan diseases and other nonnative species imported unintentionally (such as the invasive tunicate <i>Didemnum</i>). While certain species introduced under alternative D are native to the region (e.g., purple-hinged rock scallops and Olympia oysters), they are not readily present in Drakes Estero in adult form. The use of both bottom bags and racks has been implicated in detectable changes in benthic communities. These impacts would be clearly detectable and could appreciably affect the individual species, communities, or natural processes. Cumulative impacts would be long-term moderate adverse, and alternative D would contribute an appreciable adverse increment to the overall cumulative impact.</p> <p>The introduction and maintenance of nonnative species in Drakes Estero does not further the goal</p>

TABLE ES-4. SUMMARY OF ENVIRONMENTAL CONSEQUENCES (CONTINUED)

Alternative A	Alternative B	Alternative C	Alternative D
Action/Impact	Action/Impact	Action/Impact	Action/Impact
interfere with natural processes and habitat (NPS 2006d).	<p>potential for Didemnum expansion, and associated mariculture activities (such as infrastructure maintenance, vessel traffic, and harvesting) would pose a risk for further dispersal of this nonnative invasive tunicate via colonial fragments. The potential for increase in overall cover of Didemnum would have an adverse impact on species diversity. Lastly, the nonnative Manila clam would be produced on a much wider scale under this alternative than under existing conditions, which increases the chance of naturally breeding populations of this species becoming established in Drakes Estero (NAS 2004, 2009). These impacts would be clearly detectable and could appreciably affect individual species, communities, or natural processes. The cumulative impact would be long-term moderate adverse, and alternative B would contribute an appreciable adverse increment to the overall cumulative impact.</p> <p>The introduction and maintenance of nonnative species in Drakes Estero does not further the goal of NPS Management Policies 2006, which is to minimize the impacts of human activities on native benthic fauna populations. All species that could be cultivated are nonnative with the exception of the purple-hinged rock scallop, which is native to the rocky California coast but is only likely to be found in Drakes Estero in larval form.</p>	of NPS Management Policies 2006, which is to minimize the impacts of human activities on native benthic fauna populations. All species that could be cultivated are nonnative with the exception of the purple-hinged rock scallop, which is native to the rocky California coast but is only likely to be found in Drakes Estero in larval form.	of NPS Management Policies 2006, which is to minimize the impacts of human activities on native benthic fauna populations. All species that could be cultivated are nonnative with the exception of the purple-hinged rock scallop, which is native to the rocky California coast but is only likely to be found in Drakes Estero in larval form, and the Olympia oyster, which also prefers a hard substrate and is not present in Drakes Estero in large numbers. Additionally, DBOC's proposal to collect native shellfish larvae within Drakes Estero would not be consistent with the NPS mission, per Management Policies 2006 (NPS 2006d) or regulations.
<b>Wildlife and Wildlife Habitat: Fish</b>			
<p>Overall, alternative A would result in long-term beneficial impacts on fish due to the restoration of natural fish habitat, particularly those attributed to Pacific groundfish habitat in the Groundfish Plan, which in turn would provide increased cover for fish from piscivorous birds and other fish as well as increased prey for larger groundfish.</p> <p>Alternative A would result in a more natural</p>	<p>Overall, alternative B would result in long-term minor adverse impacts on fish because while the natural species composition would remain altered due to the presence of non-natural structured habitat, impacts would be relatively localized and confined to the 7 acres of racks and would not affect the overall structure of any natural community. The maintenance of shellfish racks</p>	<p>Overall, alternative C would result in long-term minor adverse impacts on fish because while the natural species composition would remain altered due to the presence of non-natural structured habitat, impacts would be relatively localized and confined to the 7 acres of racks and would not affect the overall structure of any natural community. The maintenance of shellfish racks</p>	<p>Overall, alternative D would result in long-term minor adverse impacts on fish because while the natural species composition would remain altered due to the presence of non-natural structured habitat, impacts would be relatively localized and confined to the 7 acres of racks and would not affect the overall structure of any natural community. The maintenance of shellfish racks</p>

TABLE ES-4. SUMMARY OF ENVIRONMENTAL CONSEQUENCES (CONTINUED)

Alternative A	Alternative B	Alternative C	Alternative D
Action/Impact	Action/Impact	Action/Impact	Action/Impact
<p>species composition within the project area. Alternative A also would result in short-term minor adverse impacts because disruption of fish during rack removal from Drakes Estero would be localized and slightly detectable, but would not affect the overall structure of any natural community. The cumulative impact would be beneficial, and alternative A would contribute a noticeable beneficial increment to the overall cumulative impact.</p> <p>Alternative A would be consistent with the guidance set forth in NPS Management Policies 2006 for the maintenance and restoration of natural native ecosystems, including restoration of native fish communities (NPS 2006d). Additionally, this alternative would be consistent with the goals set forth in the Magnuson-Stevens Fishery Conservation and Management Act because the essential fish habitat (habitat of particular concern) designated within the Pacific Fishery Management Council's Groundfish Management Plan would be maintained and improved.</p>	<p>would continue to displace approximately 7 acres of natural fish habitat which would otherwise provide increased cover for fish from piscivorous birds and other fish as well as increased prey for larger groundfish, particularly those attributed to Pacific groundfish habitat in the Groundfish Plan. The cumulative impact would be long-term beneficial, and alternative B would contribute a noticeable adverse increment to the overall beneficial cumulative impact.</p> <p>With regards to fish, continued operation of DBOC for 10 additional years would not be consistent with relevant law and policy. The continued maintenance of a non-natural community in Drakes Estero does not further the goal of NPS Management Policies 2006 to preserve and restore natural communities and ecosystems. Perpetuation of non-natural habitat would continue to attract fish communities that would not naturally be found in Drakes Estero. Additionally, this alternative would not be consistent with the goals set forth in the Magnuson-Stevens Fishery Conservation and Management Act because damage to eelgrass designated as essential fish habitat (habitat of particular concern) within the Pacific Fishery Management Council's Groundfish Management Plan would continue.</p>	<p>would continue to displace approximately 7 acres of natural fish habitat which would otherwise provide increased cover for fish from piscivorous birds and other fish as well as increased prey for larger groundfish, particularly those attributed to Pacific groundfish habitat in the Groundfish Plan. The cumulative impact would be long-term beneficial, and alternative C would contribute a noticeable adverse increment to the overall beneficial cumulative impact.</p> <p>With regards to fish, continued operation of DBOC for 10 additional years would not be consistent with relevant law and policy. The continued maintenance of a non-natural community in Drakes Estero does not further the goal of NPS Management Policies 2006 to preserve and restore natural communities and ecosystems. Perpetuation of non-natural habitat would continue to attract fish communities that would not naturally be found in Drakes Estero. Additionally, this alternative would not be consistent with the goals set forth in the Magnuson-Stevens Fishery Conservation and Management Act because damage to eelgrass designated as essential fish habitat (habitat of particular concern) within the Pacific Fishery Management Council's Groundfish Management Plan would continue.</p>	<p>would continue to displace approximately 7 acres of natural fish habitat which would otherwise provide increased cover for fish from piscivorous birds and other fish as well as increased prey for larger groundfish, particularly those attributed to Pacific groundfish habitat in the Groundfish Plan. The cumulative impact would be long-term beneficial, and alternative D would contribute a noticeable adverse increment to the beneficial cumulative impact.</p> <p>With regards to fish, continued operation of DBOC for 10 additional years would not be consistent with relevant law and policy. The continued maintenance of a non-natural community in Drakes Estero does not further the goal of NPS Management Policies 2006 to preserve and restore natural communities and ecosystems. Perpetuation of non-natural habitat would continue to attract fish communities that would not naturally be found in Drakes Estero. Additionally, this alternative would not be consistent with the goals set forth in the Magnuson-Stevens Fishery Conservation and Management Act because damage to eelgrass designated as essential fish habitat (habitat of particular concern) within the Pacific Fishery Management Council's Groundfish Management Plan would continue.</p>
<b>Wildlife and Wildlife Habitat: Harbor Seals</b>			
<p>Overall, alternative A would result in long-term beneficial impacts on harbor seals due to the termination of DBOC operations and associated human activities within Drakes Estero. Disturbance would be limited to recreational kayakers, hikers on the adjacent landscape, and aircraft. The former two would be prohibited (and physically excluded from accessing the kayak launch) during harbor seal pupping season.</p>	<p>Overall, alternative B would result in long-term moderate adverse impacts on harbor seals due to continuation of commercial shellfish operations within Drakes Estero year-round, for another 10 years, and the associated use of motorboats and bottom bag cultivation on sandbars and mudflats adjacent to the designated harbor seal protection areas. This would result in continued human presence and potential harbor seal disturbances</p>	<p>Overall, alternative C would result in long-term moderate adverse impacts on harbor seals due to continuation of commercial shellfish operations within Drakes Estero year-round, for another 10 years, and the associated use of motorboats and bottom bag cultivation on sandbars and mudflats adjacent to the designated harbor seal protection areas. This would result in continued human presence and potential harbor seal disturbances</p>	<p>Overall, alternative D would result in long-term moderate adverse impacts on harbor seals due to continuation of commercial shellfish operations within Drakes Estero year-round, for another 10 years, and the associated use of motorboats and bottom bag cultivation on mudflats adjacent to the designated harbor seal protection areas. This would result in continued human presence and potential harbor seal disturbances throughout the</p>

TABLE ES-4. SUMMARY OF ENVIRONMENTAL CONSEQUENCES (CONTINUED)

Alternative A	Alternative B	Alternative C	Alternative D
Action/Impact	Action/Impact	Action/Impact	Action/Impact
<p>Based on current research (Becker, Press, and Allen 2011), the termination of shellfish mariculture in Drakes Estero may benefit the distribution and abundance of the native harbor seal population. Alternative A may also result in short-term minor adverse impacts due to impacts associated with rack removal, which would be localized and slightly detectable, but would not affect the overall structure of any natural community. These activities would be conducted outside of the harbor seal pupping season to minimize adverse impacts. The cumulative impact would be long-term beneficial, and alternative A would contribute an appreciable beneficial increment to the overall cumulative impact.</p> <p>With respect to harbor seals, alternative A is consistent with relevant law and policy because removal of DBOC operations from Drakes Estero would remove an unnatural stimulus that currently affects harbor seal behavior. Additionally, the decrease in disturbance to this species would be consistent with MMPA (16 USC 1361 et seq., 1401–1407, 1538, 4107).</p>	<p>throughout the year. Although the mandatory buffer of 100 yards from hauled-out harbor seals (year round) and other restrictions during the harbor seal pupping season would be retained in the SUP issued to DBOC, alternative B would result in moderate adverse impacts on harbor seals due to the potential for displacement and continued disturbances that are known to disrupt harbor seal behavior. The impacts associated with alternative B would be clearly detectable and could appreciably affect harbor seals and harbor seal habitat. The cumulative impact would be long-term moderate adverse, and alternative B would contribute an appreciable adverse increment to the overall cumulative impact.</p> <p>With respect to harbor seals, alternative B does not further the goals of relevant law and policy because continued DBOC operations in Drakes Estero would maintain an unnatural stimulus that has the potential to affect harbor seal behavior. NPS Management Policies 2006 specify that NPS managers should strive to preserve and restore “behaviors of native plant and animal populations and the communities and ecosystems in which they occur” (NPS 2006d). Additionally, the continued disturbance to this species would be subject to regulation by the MMPA (16 USC 1361 et seq., 1401–1407, 1538, 4107). The MMPA prohibits, with certain exceptions, the take of marine mammals in U.S. waters and by U.S. citizens, and the importation of marine mammals and marine mammal products into the United States. Under the MMPA, “take” is defined as “harass, hunt, capture, kill or collect, or attempt to harass, hunt, capture, kill or collect.” “Harassment” is defined as “any act of pursuit, torment, or annoyance which has the potential to injure a marine mammal in the wild, or has the potential to disturb a marine mammal in the wild</p>	<p>throughout the year. Although the mandatory buffer of 100 yards from hauled-out harbor seals (year round) and other restrictions during the harbor seal pupping season would be retained in the SUP issued to DBOC, alternative C would result in moderate adverse impacts on harbor seals due to the potential for displacement and continued disturbances that are known to disrupt harbor seal behavior. The impacts associated with alternative C would be clearly detectable and could appreciably affect harbor seals and harbor seal habitat. The cumulative impact would be long-term moderate adverse, and alternative C would contribute an appreciable adverse increment to the overall cumulative impact.</p> <p>With respect to harbor seals, alternative C does not further the goals of relevant law and policy because continued DBOC operations in Drakes Estero would maintain an unnatural stimulus that has the potential to affect harbor seal behavior. NPS Management Policies 2006 specify that NPS managers should strive to preserve and restore “behaviors of native plant and animal populations and the communities and ecosystems in which they occur” (NPS 2006d). Additionally, the continued disturbance to this species would be subject to regulation by the MMPA (16 USC 1361 et seq., 1401–1407, 1538, 4107). The MMPA prohibits, with certain exceptions, the take of marine mammals in U.S. waters and by U.S. citizens, and the importation of marine mammals and marine mammal products into the United States. Under the MMPA, “take” is defined as “harass, hunt, capture, kill or collect, or attempt to harass, hunt, capture, kill or collect.” “Harassment” is defined as “any act of pursuit, torment, or annoyance which has the potential to injure a marine mammal in the wild, or has the potential to disturb a marine mammal in the wild</p>	<p>year. Although the mandatory buffer of 100 yards from hauled-out harbor seals (year round) and other restrictions during the harbor seal pupping season would be retained in the SUP issued to DBOC, alternative D would result in moderate adverse impacts on harbor seals due to the potential for displacement and continued disturbances that are known to disrupt harbor seal behavior. The adverse impacts associated with alternative D would be of greater magnitude than those associated with alternatives B and C due to the likely increase in boat traffic in Drakes Estero associated with increased production levels (approximately 40 percent greater than alternative B and 70 percent greater than alternative C), but are still expected to be moderate in intensity and would be clearly detectable and could appreciably affect harbor seals and harbor seal habitat. The cumulative impact would be long-term moderate adverse, and alternative D would contribute an appreciable adverse increment to the overall cumulative impact.</p> <p>With respect to harbor seals, alternative D does not further the goals of relevant law and policy because continued DBOC operations in Drakes Estero would maintain an unnatural stimulus that has the potential to affect harbor seal behavior. NPS Management Policies 2006 specify that NPS managers should strive to preserve and restore “behaviors of native plant and animal populations and the communities and ecosystems in which they occur” (NPS 2006d). Additionally, the continued disturbance to this species would be subject to regulation by the MMPA (16 USC 1361 et seq., 1401–1407, 1538, 4107). The MMPA prohibits, with certain exceptions, the take of marine mammals in U.S. waters and by U.S. citizens, and the importation of marine mammals and marine mammal products into the United</p>



TABLE ES-4. SUMMARY OF ENVIRONMENTAL CONSEQUENCES (CONTINUED)

Alternative A	Alternative B	Alternative C	Alternative D
Action/Impact	Action/Impact	Action/Impact	Action/Impact
	by causing disruption of behavioral patterns, including, but not limited to, migration, breathing, nursing, breeding, feeding, or sheltering." Under the MMPA, if an activity is defined as harassment under the above criteria, a specific permit called an Incidental Harassment Authorization may be required.	by causing disruption of behavioral patterns, including, but not limited to, migration, breathing, nursing, breeding, feeding, or sheltering." Under the MMPA, if an activity is defined as harassment under the above criteria, a specific permit called an Incidental Harassment Authorization may be required.	States. Under the MMPA, "take" is defined as "harass, hunt, capture, kill or collect, or attempt to harass, hunt, capture, kill or collect." "Harassment" is defined as "any act of pursuit, torment, or annoyance which has the potential to injure a marine mammal in the wild, or has the potential to disturb a marine mammal in the wild by causing disruption of behavioral patterns, including, but not limited to, migration, breathing, nursing, breeding, feeding, or sheltering." Under the MMPA, if an activity is defined as harassment under the above criteria, a specific permit called an Incidental Harassment Authorization may be required.
<b>Wildlife and Wildlife Habitat: Birds</b>			
Overall, alternative A would result in long-term beneficial impacts on birds due to the removal of the commercial shellfish operation within Drakes Estero and its associated human activities. Removal of DBOC motorboats and related activities would minimize the disruption of biological activities such as foraging and resting. Intertidal areas previously used by DBOC for the bottom bag cultivation in commercial operations would result in up to 88 additional acres of foraging and resting habitat for resident and migratory birds. Alternative A may result in adverse impacts to birds from rack removal, but the impacts would be short-term and minor because they would be highly localized and would not affect the overall structure of any natural community. Cumulative impacts would be long-term beneficial and alternative A would contribute an appreciable beneficial increment to the overall cumulative impacts.	Alternative B would result in long-term moderate adverse impacts on birds and bird habitat due to the continuation of commercial shellfish operations and the associated human activities within Drakes Estero for an additional 10 years. Continued use of motorboats and other noise-producing equipment, as well as maintenance of shellfish growing structures, within Drakes Estero would continue to disrupt biological activity of birds, such as foraging and resting behavior, potentially leading to a reduction in fitness and reproductive success. Noise disturbance from DBOC operations would also alter other biological activities of birds using Drakes Estero, such as predator avoidance. The impacts of alternative B would be clearly detectable and could appreciably affect birds and bird habitat within the project area. The cumulative impact would be long-term moderate adverse, and alternative B would contribute an appreciable adverse increment to the overall impact.	Alternative C would result in long-term moderate adverse impacts on birds and bird habitat due to the continuation of commercial shellfish operations within Drakes Estero for an additional 10 years and the associated human activities. Continued use of motorboats and other noise-producing equipment, as well as maintenance of shellfish growing structures, within Drakes Estero would continue to disrupt biological activity of birds, such as foraging and resting behavior, potentially leading to a reduction in fitness and reproductive success. Noise disturbance from DBOC operations would also alter other biological activities of birds using Drakes Estero, such as predator avoidance. The impacts of alternative C would be clearly detectable and could appreciably affect birds and bird habitat within the project area. The cumulative impact would be long-term moderate adverse, and alternative C would contribute an appreciable adverse increment to the cumulative impact.	Alternative D would result in long-term moderate adverse impacts on birds and bird habitat due to the continuation of commercial shellfish operations within Drakes Estero for an additional 10 years and the associated human activities. Continued use of motorboats and other noise-producing equipment, as well as maintenance of shellfish growing structures, within Drakes Estero would continue to disrupt biological activity of birds, such as foraging and resting behavior, potentially leading to a reduction in fitness and reproductive success. Noise disturbance from DBOC operations would also alter other biological activities of birds using Drakes Estero, such as predator avoidance. These adverse impacts would be greater than those associated with alternatives B and C due to the likely increase in DBOC boat traffic in Drakes Estero associated with increased production (approximately 40 percent greater than alternative B and 70 percent greater than alternative C), but are still expected to be moderate in intensity, would remain clearly detectable and could appreciably affect birds and bird habitat within the project area. The
Alternative A would be consistent with the goals set forth in both NPS Management Policies 2006 and the MBTA. NPS Management Policies 2006	With respect to birds, alternative B would not be consistent with the goals set forth in the NPS	With respect to birds, alternative C would not be consistent with the goals set forth in the NPS	

TABLE ES-4. SUMMARY OF ENVIRONMENTAL CONSEQUENCES (CONTINUED)

Alternative A	Alternative B	Alternative C	Alternative D
Action/Impact	Action/Impact	Action/Impact	Action/Impact
specify that NPS managers should strive to preserve and restore "behaviors of native plant and animal populations and the communities and ecosystems in which they occur" (NPS 2006d). The MBTA (16 USC 703–712, as amended) makes it illegal for people to "take" migratory birds, their eggs, feathers or nests.	Management Policies 2006, which specifies that NPS managers should strive to preserve and restore "behaviors of native plant and animal populations and the communities and ecosystems in which they occur" (NPS 2006d). No actions are anticipated to be inconsistent with the MBTA (16 USC 703–712, as amended), which makes it illegal to "take" migratory birds, their eggs, feathers or nests.	Management Policies 2006, which specifies that NPS managers should strive to preserve and restore "behaviors of native plant and animal populations and the communities and ecosystems in which they occur" (NPS 2006d). No actions are anticipated to be inconsistent with the MBTA (16 USC 703–712, as amended), which makes it illegal to "take" migratory birds, their eggs, feathers or nests.	cumulative impact would be long-term moderate adverse, and alternative D would contribute an appreciable adverse increment to the overall impact.  With respect to birds, alternative D would not be consistent with the goals set forth in the NPS Management Policies 2006, which specifies that NPS managers should strive to preserve and restore "behaviors of native plant and animal populations and the communities and ecosystems in which they occur" (NPS 2006d). No actions are anticipated to be inconsistent with the MBTA (16 USC 703–712, as amended), which makes it illegal for people to "take" migratory birds, their eggs, feathers or nests.
<b>Special-Status Species</b>			
Overall, alternative A would result in long-term beneficial impacts on special-status species (federally listed animal species) and critical habitat. Alternative A may also result in short-term minor adverse impacts to special-status species during removal of DBOC facilities and personal property because removal could disturb individuals or cause temporary sedimentation within designated critical habitat. The short-term impacts related to removal would be highly localized and would last up to two months. The cumulative impact would be long-term beneficial, and alternative A would contribute a noticeable beneficial increment to the overall cumulative impact.  For all special-status species discussed above, alternative A would be consistent with relevant law and policy. Alternative A would forward the goal set forth in NPS Management Policies 2006, which states that the NPS will "survey for, protect,	Overall, alternative B would result in continued long-term minor adverse impacts on federally listed animal species for an additional 10 years because ongoing DBOC operations could cause a disruption in individuals and/or designated critical habitat. Cumulative impacts would be long-term beneficial, and alternative B would contribute a noticeable adverse increment to the overall cumulative impact.  For all special-status species discussed above, alternative B would be consistent with relevant law and policy. However, alternative B would not fulfill the goals articulated in NPS Management Policies 2006 as well as alternative A. NPS Management Policies 2006, which states that the NPS will "survey for, protect, and strive to recover all species native to national park service units that are listed under the Endangered Species Act" (NPS 2006d). UFWFS and NMFS are given the authority under the ESA to determine whether or	Overall, alternative C would result in continued long-term minor adverse impacts on federally listed animal species for an additional 10 years because ongoing DBOC operations could cause a disruption in individuals and/or designated critical habitat. Cumulative impacts would be long-term beneficial, and alternative C would contribute a noticeable adverse increment to the overall cumulative impact.  For all special-status species discussed above, alternative C would be consistent with relevant law and policy. However, alternative C would not fulfill the goals articulated in NPS Management Policies 2006 as well as alternative A. NPS Management Policies 2006, which states that the NPS will "survey for, protect, and strive to recover all species native to national park service units that are listed under the Endangered Species Act" (NPS 2006d). UFWFS and NMFS are given the authority under the ESA to determine whether or	Overall, alternative D would result in long-term minor adverse impacts on special-status species for an additional 10 years due to the continued operation of a commercial shellfish operation within Drakes Estero. As discussed above, the impacts of alternative D may be greater than alternatives B and C due to increased production levels (approximately 40 percent greater than alternative B and 70 percent greater than alternative C). Alternative D would also have short-term minor adverse impacts on Myrtle's silverspot butterfly and California red-legged frog critical habitat during redevelopment of the site because of the potential for habitat to be displaced and the increased risk for vehicle strikes. The cumulative impact would be long-term beneficial, and alternative D would contribute a noticeable adverse increment to the overall cumulative impact.  For all special-status species discussed above,

TABLE ES-4. SUMMARY OF ENVIRONMENTAL CONSEQUENCES (CONTINUED)

Alternative A	Alternative B	Alternative C	Alternative D
Action/Impact	Action/Impact	Action/Impact	Action/Impact
and strive to recover all species native to national park service units that are listed under the Endangered Species Act* (NPS 2006d). Alternative A would also fulfill the federal mandate set forth by the ESA to conserve listed species and ensure that their actions do not jeopardize the continued existence of the listed species.	not actions jeopardize the continued existence of listed species. NPS will complete consultation with USFWS and/or NMFS would be prior to the release of the final EIS to ensure that the action would not jeopardize the species' continued existence or result in destruction or adverse modification of critical habitat.	not actions jeopardize the continued existence of listed species. NPS will complete consultation with USFWS and/or NMFS would be prior to the release of the final EIS to ensure that the action would not jeopardize the species' continued existence or result in destruction or adverse modification of critical habitat.	alternative D would be consistent with relevant law and policy. However, alternative D would not fulfill the goals articulated in NPS Management Policies 2006 as well as alternative A. NPS Management Policies 2006, which states that the NPS will "survey for, protect, and strive to recover all species native to national park service units that are listed under the Endangered Species Act" (NPS 2006d). USFWS and NMFS are given the authority under the ESA to determine whether or not actions jeopardize the continued existence of listed species. NPS will complete consultation with USFWS and/or NMFS would be prior to the release of the Final EIS to ensure that the action would not jeopardize the species' continued existence or result in destruction or adverse modification of critical habitat.
<b>Coastal Flood Zones</b>			
Overall, alternative A would result in long-term beneficial impacts on the coastal flood zone due to an increase in flood storage capacity of the onshore area and the removal of structures and materials that have the potential to cause damage during a flood event. The cumulative impact would be beneficial, and alternative A would contribute a noticeable beneficial increment to the cumulative impacts.	Overall, alternative B would result in long-term moderate adverse impacts on the coastal flood zone within the project area for an additional 10 years because continued DBOC operations would take place within the flood zone and would result in continued potential for flood damage to property and/or environmental contamination at the project site. Offshore structures and materials could be damaged and/or dislodged during a flood event, potentially causing damage to resources within Drakes Estero. Onshore, it is anticipated that the punching shed, shop, processing plant, and stringing shed would be inundated during a 100-year flood event, potentially causing damage to the structures and contents as well as local contamination. Shell piles would reduce flood storage capacity in the area, while proposed dredging in the vicinity of the dock would offset these impacts to some extent. Wastewater collection tanks would also be inundated during a 100-year flood event,	Overall, alternative C would result in long-term moderate adverse impacts on the coastal flood zone within the project area for an additional 10 years because continued DBOC operations would take place within the flood zone and would result in continued potential for flood damage to property and/or environmental contamination at the project site. Offshore structures and materials could be damaged and/or dislodged during a flood event, potentially causing damage to resources within Drakes Estero. Onshore, it is anticipated that the punching shed, shop, processing plant, and stringing shed would be inundated during a 100-year flood event, potentially causing damage to the structures and contents as well as local contamination. Shell piles would reduce flood storage capacity in the area, while proposed dredging in the vicinity of the dock would offset these impacts to some extent. Wastewater collection tanks would also be inundated during a 100-year flood event,	Overall, alternative D would result in long-term moderate adverse impacts on the coastal flood zone due to continued mariculture operations. Existing structures are within the flood zone, which could result in increased potential for flood damage to property or environmental contamination at the project site. Compared to alternatives B and C, alternative D would result in increased flood zone impacts from the offshore facilities due to additional racks and bottom bags to accommodate the higher shellfish production level. The construction of new facilities may take place within the flood zone if alternative site locations outside of the flood zone but within the SUP area were determined to be infeasible through a subsequent planning process. If located within the flood zone, the new facility would result in continued potential for flood damage to property and/or environmental contamination at the project site. Wastewater collection systems would remain as described in alternatives B and
With respect to coastal flood zones, alternative A is consistent with relevant law and policy. Removal of structures and residences within the flood zone would fulfill the goals set forth by Presidential Executive Order 11988, "Floodplain Management" and the subsequent NPS Director's Order 77-2 and Procedural Manual 77-2: Floodplain Management, which are intended to properly conserve, manage, and protect flood zones on NPS lands to protect human health and the environment and prevent damage to property			

TABLE ES-4. SUMMARY OF ENVIRONMENTAL CONSEQUENCES (CONTINUED)

Alternative A	Alternative B	Alternative C	Alternative D
Action/Impact	Action/Impact	Action/Impact	Action/Impact
in the event of a flood event.	<p>potentially causing leaks of untreated wastewater to enter Drakes Estero. The cumulative impact would be long-term moderate adverse, and alternative B would contribute an appreciable adverse increment to the overall cumulative impact.</p> <p>NPS guidelines require that new actions within the flood zone comply with Procedural Manual 77-2: Floodplain Management. This alternative would allow the continued use of nonconforming structures, and no new structures would be placed in the coastal flood zone. As such, this alternative would comply with existing NPS guidelines and procedures.</p>	<p>potentially causing leaks of untreated wastewater to enter Drakes Estero. The cumulative impact would be long-term moderate adverse, and alternative C would contribute an appreciable adverse increment to the cumulative impact.</p> <p>NPS guidelines require that new actions within the flood zone comply with Procedural Manual 77-2: Floodplain Management. This alternative would allow the continued use of nonconforming structures, and no new structures would be placed in the coastal flood zone. As such, this alternative would comply with existing NPS guidelines and procedures.</p>	<p>C, and flood zone impacts from other structures (punching shed, stringing shed, dock, washing station, and mobile homes) would be the same as those under alternatives B and C. An increase in production would likely result in additional shell being added to the shell piles located within the flood zone, resulting in a reduction of flood storage capacity. The cumulative impact would be long-term moderate adverse, and alternative D would contribute an appreciable adverse increment to the cumulative impact.</p> <p>Alternative D is the only alternative that includes new onshore development, which is a Class I Action specified in the Procedural Manual 77-2: Floodplain Management. As such, the new structure would require a Statement of Findings (SOF) if alternative site locations outside of the coastal flood zone but within the SUP area were determined to be infeasible. The SOF process would ensure the structure is properly designed and constructed in a way that minimizes impacts to the flood zone.</p>
<b>Water Quality</b>			
Overall, alternative A would result in long-term beneficial impacts on water quality as a result of reduced non-point-source runoff and the elimination of future disturbances to the Drakes Estero bottom from boats and offshore structures. Bivalves filter and process suspended solids, nutrients, and phytoplankton from the water column resulting in cleaner, less turbid water. Drakes Estero is not a highly turbid coastal embayment (NAS 2009), so bivalve contributions to water clarity would likely be limited relatively minor and limited. Based on west coast research (Dumbauld, Ruesink, and Rumrill 2009), the positive ecosystem effects typically attributed to bivalves, such as nutrient cycling and water	Overall, this alternative would result in long-term minor adverse impacts on water quality for another 10 years. Alternative B would have recurring but not long-lasting effects on water quality and would be within historical water quality standards. Cultivated shellfish as filter feeders would remain in Drakes Estero under this alternative, offering localized long-term beneficial impacts to water quality by removing suspended solids, nutrients, and phytoplankton from the water column. Sediment disturbances from offshore mariculture activities (bags/trays, boats, wading DBOC employees) would be locally temporary (pulsing) and would dissipate after each tide cycle, resulting in short-term minor	Overall, alternative C would result in long-term minor adverse impacts on water quality for another 10 years. Alternative C would have recurring but not long-lasting effects on water quality and would be within historical water quality standards. Cultivated shellfish would remain in Drakes Estero for another 10 years under this alternative, offering localized beneficial water filtering functions from the removal of suspended solids, nutrients, and phytoplankton from the water column. Impacts to water quality include those described under alternative B. In particular, sediment disturbances from offshore mariculture activities (bags/trays, boats, wading DBOC employees) would be locally temporary (pulsing)	Overall, alternative D would have short-term minor adverse and long-term minor adverse impacts on water quality due to offshore and onshore activities associated with commercial shellfish operations within Drakes Estero. Alternative D would not be expected to exceed water quality standards, have long-lasting effects on water quality or impede the goals and objectives of NPS policies on water quality. Alternative D would have the highest population of cultivated shellfish occupying Drakes Estero. As a result, localized water quality benefits from filter feeding bivalves would be greatest compared to the other alternatives. The impacts associated with alternative D would be similar to

TABLE ES-4. SUMMARY OF ENVIRONMENTAL CONSEQUENCES (CONTINUED)

Alternative A	Alternative B	Alternative C	Alternative D
Action/Impact	Action/Impact	Action/Impact	Action/Impact
<p>clarity, would be expected to be relatively minor in west coast estuaries like Drakes Estero. This is because the nutrient dynamics in these systems are driven by coastal upwelling and a strong tidal cycle which flushes small estuaries like Drakes Estero on a daily basis. However, to the extent that localized beneficial effects from DBOC bivalves influence eelgrass productivity near DBOC beds and racks (see discussion under alternative B), the removal of DBOC-cultured bivalves under alternative A would result in adverse impacts on eelgrass at these sites. Thus, minor adverse impacts to water quality in Drakes Estero would be expected to occur under this alternative. Removal of the racks and bags would cause a short-term minor adverse impact on water quality due to the sediment disturbances from personnel removing the offshore structures. These adverse impacts would be temporary and localized. The cumulative impact would be long-term beneficial, and alternative A would contribute a noticeable beneficial impact to the cumulative impact.</p> <p>With regards to water quality, alternative A would satisfy the goals and objectives of NPS Management Policies 2006 (NPS 2006d) and would be consistent with the purpose of the CWA, which is to "restore and maintain the chemical, physical, and biological integrity of the nation's waters."</p>	<p>adverse impacts on water quality. Dredging around the floating dock would be expected to create temporary disturbances to the water column from increased turbidity. This action would cause short-term minor adverse impacts on water quality. The point-source discharges (washing station and setting tanks) under this alternative would continue, but no new point-source outputs would be introduced. Point-source discharges would include small amounts of marine sediments and fouling organisms removed at the washing station; no chemical contaminants would be discharged into Drakes Estero under this alternative. Non-point-source pollution from runoff is currently very small (less than 3 acres of impervious surface within a watershed of several square miles). The cumulative impact would be long-term minor adverse, and alternative B would contribute a noticeable adverse increment to the cumulative impact.</p> <p>With regards to water quality, alternative B would satisfy the goals and objectives of NPS Management Policies 2006 (NPS 2006d) and would be consistent with the purpose of the CWA, which is to "restore and maintain the chemical, physical, and biological integrity of the nation's waters."</p>	<p>and would dissipate after each tide cycle, resulting in short-term minor adverse impacts on water quality. Dredging around the floating dock would be expected to create temporary disturbances to the water column from increased turbidity, resulting in short-term minor adverse impacts on water quality. Point-source discharges would include small amounts of marine sediments and fouling organisms removed at the washing station; no chemical contaminants would be discharged into Drakes Estero under this alternative. Nonpoint-source pollution from runoff is currently very small (less than 3 acres of impervious surface within a watershed of several square miles). The cumulative impact would be long-term minor adverse, and alternative C would contribute a noticeable adverse increment to the overall cumulative impacts.</p> <p>With regards to water quality, alternative C would satisfy the goals and objectives of NPS Management Policies 2006 (NPS 2006d) and would be consistent with the purpose of the CWA, which is to "restore and maintain the chemical, physical, and biological integrity of the nation's waters."</p>	<p>those described under alternatives B and C. However, this alternative may cause slightly higher rates of sediment disturbance in Drakes Estero, compared to alternatives B and C, due to more frequent boat trips and bag/tray management. Onshore discharge into Drakes Estero of pumped water serving the washing station and setting tanks would be expected to add minor adverse impacts to water quality. In addition, onshore sediment may enter waters due to the construction of new facilities, although this action could be mitigated with the installation of silt fencing. Alternative D also would result in short-term minor adverse impacts on water quality during construction of new DBOC facilities because impacts would include temporary (lasting less than a year), localized impacts that would not have long-lasting effects on water quality. The cumulative impact would be long-term minor adverse, and alternative D would contribute a noticeable adverse increment to the cumulative impact.</p> <p>With regards to water quality, alternative D would satisfy the goals and objectives of NPS Management Policies 2006 (NPS 2006d) and would be consistent with the purpose of the CWA, which is to "restore and maintain the chemical, physical, and biological integrity of the nation's waters."</p>
<b>Soundscapes</b>			
<p>Alternative A would result in long-term beneficial impacts due to the elimination of human-caused noise levels associated with the commercial shellfish operation. Alternative A would also result in adverse impacts to soundscapes because the noise associated with the use of heavy machinery and motorized boats to remove DBOC structures</p>	<p>Overall, alternative B would result in short-term minor and long-term major adverse impacts on soundscapes. Short-term minor adverse impacts on the natural soundscape would result from the use of heavy machinery during replacement of the main dock, work platform, and associated structures. The use of heavy machinery would be</p>	<p>Overall, alternative C would result in short-term minor and long-term major adverse impacts on soundscapes. Short-term minor adverse impacts on soundscapes would result from the use of heavy machinery during replacement of the main dock, work platform, and associated structures. The use of heavy machinery would be at a level</p>	<p>Overall, alternative D would result in short-term moderate and long-term major adverse impacts on soundscapes. Alternative D would result in short-term moderate adverse impacts on soundscapes due to the use of heavy machinery during the construction of additional onshore facilities. The use of heavy machinery would be at</p>



TABLE ES-4. SUMMARY OF ENVIRONMENTAL CONSEQUENCES (CONTINUED)

Alternative A	Alternative B	Alternative C	Alternative D
Action/Impact	Action/Impact	Action/Impact	Action/Impact
<p>and property would be at a level that would cause vocal communication to be difficult at a distance of less than 16 feet. However, this impact would interfere with the natural soundscape for less than 5 percent of one year; therefore, Alternative A would result in short-term minor to moderate adverse impacts on soundscapes. The cumulative impact would be long-term beneficial, and alternative A would contribute an appreciable beneficial increment to the cumulative impact.</p> <p>With regard to soundscapes, alternative A would further the goals for soundscape management as set forth in relevant law and policy. NPS Management Policies 2006 and Director's Order 47: Soundscape Preservation and Noise Management direct NPS managers to preserve and restore the natural soundscape, where possible.</p>	<p>at a level that would cause vocal communication to be difficult at distances of less than 16 feet. However, this impact would interfere with the natural soundscape for less than 5 percent of one year; therefore, alternative B would result in short-term minor adverse impacts to the natural soundscape. Alternative B would also result in continued long-term major adverse impacts on the natural soundscape due to the operation of boats and other onshore machinery that would be at a level that would cause vocal communication to be difficult at distances of less than 16 feet. This impact would interfere with the natural soundscape between 14 and 29 percent of the time over the 10-year SUP term; therefore, alternative B would result in long-term major adverse impacts on the natural soundscape. The cumulative impact would be long-term major adverse, and alternative B would contribute an appreciable increment to the cumulative impact.</p> <p>With regard to soundscapes, alternative B would not further the goals for soundscape management as set forth in relevant law and policy. For instance, NPS Management Policies 2006 (NPS 2006d) directs park managers to take steps to restore and maintain natural soundscapes, whereas alternative B would include continued impacts to the natural soundscape from DBOC activities. This aspect of Alternative B would also be inconsistent with 36 CFR 2.12 because it would allow DBOC to continue to use several mechanical tools that emit noise over 60 dBA at 50 feet. In addition to DBOC trucks, pneumatic drill, and oyster tumbler operating onshore, DBOC would continue to operate its motorboats in potential wilderness, where motorboats are not allowed (except for those used occasionally by NPS for administration of the wilderness in accordance with a minimum requirements</p>	<p>that would cause vocal communication to be difficult at distances of less than 16 feet. However, this impact would interfere with the natural soundscape for less than 5 percent of one year; therefore, alternative C would result in short-term minor adverse impacts to the natural soundscape. Alternative C would also result in continued long-term major adverse impacts on the natural soundscape due to the operation of boats and other onshore machinery that would be at a level that would cause vocal communication to be difficult at distances of less than 16 feet. This impact would interfere with the natural soundscape between 14 and 29 percent of the time; therefore, alternative C would result in long-term major adverse impacts on the natural soundscape. The cumulative impact would be long-term major adverse, and alternative C would contribute an appreciable adverse increment to the cumulative impact.</p> <p>With regard to soundscapes, alternative C would not further the goals for soundscape management as set forth in relevant law and policy. For instance, NPS Management Policies 2006 (NPS 2006d) directs park managers to take steps to restore and maintain natural soundscapes, whereas alternative C would include continued impacts to the natural soundscape from DBOC activities. This aspect of alternative C would also be inconsistent with 36 CFR 2.12 because it would allow DBOC to continue to use several mechanical tools that emit noise over 60 dBA at 50 feet. In addition to DBOC trucks, pneumatic drill, and oyster tumbler operating onshore, DBOC would continue to operate its motorboats in potential wilderness, where motorboats are not allowed (except for those used occasionally by NPS for administration of the wilderness in accordance with a minimum requirements</p>	<p>a level that would cause vocal communication to be difficult at distances of less than 16 feet. However, this impact would interfere with the natural soundscape for between 5 and 10 percent of one year, therefore alternative D would result in short-term moderate adverse impacts to the natural soundscape. The operation of boats and other onshore machinery for an additional 10 years would result in long-term major adverse impacts. Impacts would be at a level that would cause vocal communication to be difficult at distances of less than 16 feet and would interfere with the natural soundscape between 14 and 29 percent of the time. The cumulative impact on soundscapes would be long-term major adverse, and alternative D would contribute an appreciable adverse increment to the cumulative impact.</p> <p>With regard to soundscapes, alternative D would not further the goals for soundscape management as set forth in relevant law and policy. For instance, NPS Management Policies 2006 (NPS 2006d) directs park managers to take steps to restore and maintain natural soundscapes, whereas alternative D would include continued impacts to the natural soundscape from DBOC activities. This aspect of Alternative D would also be inconsistent with 36 CFR 2.12 because it would allow DBOC to continue to use several mechanical tools that emit noise over 60 dBA at 50 feet. In addition to DBOC trucks, pneumatic drill, and oyster tumbler operating onshore, DBOC would continue to operate its motorboats in potential wilderness, where motorboats are not allowed (except for those used occasionally by NPS for administration of the wilderness in accordance with a minimum requirements analysis). Contributions of human-caused noise to the natural soundscape are also a detriment to wilderness values, as described in more detail</p>

TABLE ES-4. SUMMARY OF ENVIRONMENTAL CONSEQUENCES (CONTINUED)

Alternative A	Alternative B	Alternative C	Alternative D
Action/Impact	Action/Impact	Action/Impact	Action/Impact
	analysis). Contributions of human-caused noise to the natural soundscape are also a detriment to wilderness values, as described in more detail under that impact topic.	analysis). Contributions of human-caused noise to the natural soundscape are also a detriment to wilderness values, as described in more detail under that impact topic.	under that impact topic.
<b>Wilderness</b>			
<p>Overall, alternative A would result in long-term beneficial impacts on wilderness because cessation of DBOC operations and removal of DBOC facilities would result in a readily apparent, widespread enhancement of wilderness character. The enhancement of wilderness character would be due to removal of a commercial shellfish operation that detracts from wilderness character in the following ways:</p> <ul style="list-style-type: none"> <li>■ cultivation of nonnative shellfish (approximately 585,000 in 2010)</li> <li>■ maintenance of human-made mariculture infrastructure including 5 miles of racks and up to 88 acres of bottom bags in up to 142 acres of Drakes Estero</li> <li>■ motorboat travel taking place for up to 8 hours per day, 6 days per week, in approximately 740 acres of Drakes Estero</li> <li>■ generation of human-caused noise affecting wilderness</li> </ul> <p>The cumulative impact would be long-term and beneficial, and alternative A would contribute an appreciable beneficial increment to the cumulative impact.</p> <p>Alternative A would enable NPS to fulfill its obligations under the acts designating wilderness within the Seashore—PL 94-544 and PL 94-567—and NPS Management Policies 2006 to actively seek to remove from potential wilderness the temporary, nonconforming conditions that</p>	<p>Overall, alternative B would result in long-term major adverse impacts on wilderness for an additional 10 years because it would result in a readily apparent, widespread, adverse impact on wilderness character and would prevent conversion to congressionally designated wilderness from congressionally designated potential wilderness. The elements of DBOC's commercial shellfish operation that detract from wilderness character include:</p> <ul style="list-style-type: none"> <li>■ cultivation of nonnative shellfish (up to 600,000 pounds per year, although a small portion of this production may be purple-hinged rock scallop which may be native to Drakes Estero in larval form but is not likely to be found in Drakes Estero)</li> <li>■ maintenance of human-made mariculture infrastructure including 5 miles of racks and up to 84 acres of bottom bags in up to 138 acres of Drakes Estero</li> <li>■ motorboat travel taking place for up to 8 hours per day, 6 days per week, in approximately 740 acres of Drakes Estero and damaging approximately 8.5 linear miles of eelgrass</li> <li>■ generation of human-caused noise affecting wilderness (emanating from both inside and outside wilderness)</li> </ul> <p>The cumulative impact would be long-term major adverse, and alternative B would contribute an appreciable adverse increment to the cumulative impact.</p>	<p>Overall, alternative C would result in long-term major adverse impacts on wilderness for an additional 10 years because it would result in a readily apparent, widespread, adverse impact on wilderness character and would prevent conversion to congressionally designated wilderness from congressionally designated potential wilderness. The elements of DBOC's commercial shellfish operation that detract from wilderness character include:</p> <ul style="list-style-type: none"> <li>■ cultivation of nonnative shellfish (up to 500,000 pounds per year, although a small portion of this production may be purple-hinged rock scallop which may be native to Drakes Estero in larval form but is not likely to be found in Drakes Estero)</li> <li>■ maintenance of human-made mariculture infrastructure including 7 miles of racks and up to 84 acres of bottom bags in up to 138 acres of Drakes Estero</li> <li>■ motorboat travel taking place for up to 8 hours per day, 6 days per week, in approximately 740 acres of Drakes Estero and damaging approximately 8.5 linear miles of eelgrass</li> <li>■ generation of human-caused noise affecting wilderness (emanating from both inside and outside wilderness)</li> </ul> <p>The cumulative impact would be long-term major adverse, and alternative C would contribute an appreciable adverse increment to the cumulative impact.</p>	<p>Overall, alternative D would result in long-term major adverse impacts on wilderness for an additional 10 years because it would result in a readily apparent, widespread, adverse impact on wilderness character and would prevent conversion to congressionally designated wilderness from congressionally designated potential wilderness. The elements of DBOC's commercial shellfish operation that detract from wilderness character include:</p> <ul style="list-style-type: none"> <li>■ cultivation of nonnative shellfish (up to 850,000 pounds per year, although a portion of this production may be purple-hinged rock scallop which may be native to Drakes Estero in larval form but is not likely to be found in Drakes Estero)</li> <li>■ maintenance of human-made mariculture infrastructure including 7 miles of racks and up to 84 acres of bottom bags in up to 138 acres of Drakes Estero</li> <li>■ motorboat travel taking place for up to 8 hours per day, 6 days per week, in approximately 740 acres of Drakes Estero and damaging approximately 8.5 linear miles of eelgrass</li> <li>■ generation of human-caused noise affecting wilderness (emanating from both inside and outside wilderness)</li> </ul> <p>The cumulative impact on wilderness would be long-term major adverse, and alternative D would contribute an appreciable adverse increment to</p>

TABLE ES-4. SUMMARY OF ENVIRONMENTAL CONSEQUENCES (CONTINUED)

Alternative A	Alternative B	Alternative C	Alternative D
Action/Impact	Action/Impact	Action/Impact	Action/Impact
preclude wilderness designation (NPS 2006d).	Alternative B would prevent NPS from fulfilling its obligations under the acts designating wilderness within the Seashore—PL 94-544 and PL 94-567—and NPS Management Policies 2006 to actively seek to remove from potential wilderness the temporary, nonconforming conditions that preclude wilderness designation. However, section 124 of PL 111-88 allows the Secretary to issue a permit to DBOC notwithstanding any other law, including the 1976 wilderness legislation. During the term of the new permit, NPS would continue to manage Drakes Estero in accordance with the Wilderness Act and complementary NPS policy to the extent possible. However, motorboats and in-water infrastructure are necessary to support the shellfish operation. The use of motorboats six days per week, the presence of infrastructure related to the existing commercial shellfish operations, and the presence of a commercial enterprise within Drakes Estero would substantially detract from the wilderness characteristics of Drakes Estero for an additional 10 years.	Alternative C would prevent NPS from fulfilling its obligations under the acts designating wilderness within Point Reyes National Seashore—PL 94-544 and PL 94-567—and NPS Management Policies 2006 to actively seek to remove from potential wilderness the temporary, nonconforming conditions that preclude wilderness designation (NPS 2006d). However, section 124 of PL 111-88 allows the Secretary to issue a permit to DBOC notwithstanding any other law, including the 1976 wilderness legislation. During the term of the new permit, NPS would continue to manage Drakes Estero in accordance with the Wilderness Act and complementary NPS policy to the extent possible. However, motorboats and in-water infrastructure are necessary to support the shellfish operation. The use of motorboats six days per week, the presence of infrastructure related to commercial shellfish operations, and the presence of a commercial enterprise within Drakes Estero would substantially detract from the wilderness characteristics of Drakes Estero for an additional 10 years.	the cumulative impacts.  Alternative D would prevent NPS from fulfilling its obligations under the acts designating wilderness within Point Reyes National Seashore—PL 94-544 and PL 94-567—and NPS Management Policies 2006 to actively seek to remove from potential wilderness the temporary, nonconforming conditions that preclude wilderness designation (NPS 2006d). However, section 124 of PL 111-88 allows the Secretary to issue a permit to DBOC notwithstanding any other law, including the 1976 wilderness legislation. During the term of the new permit, NPS would continue to manage Drakes Estero in accordance with the Wilderness Act and complementary NPS policy to the extent possible. However, motorboats and in-water infrastructure are necessary to support the shellfish operation. The use of motorboats six days per week, the presence of infrastructure related to commercial shellfish operations, and the presence of a commercial enterprise within Drakes Estero would substantially detract from the wilderness characteristics of Drakes Estero for an additional 10 years.
Visitor Experience and Recreation			
Overall, alternative A would result in long-term beneficial impacts to visitor experience and recreation because it would increase the opportunity for solitude and primitive, unconfined recreation. Alternative A would maintain visitor access to Drakes Estero, limiting access to pedestrians during the annual seal pupping season (March 1 to June 30). As described above, those looking to experience an active commercial shellfish operation could be adversely impacted by alternative A. However, this population comprises 2.5 percent of the total	Overall, alternative B would result in a long-term moderate adverse impact on visitor experience and recreation within the project area for an additional 10 years because continued commercial shellfish operations within Drakes Estero (the primary resource area) would be readily apparent and would affect many visitors to the Seashore. The impacts would somewhat inhibit visitor enjoyment of resources for which the Seashore was established. Visual and sound disturbances associated with commercial shellfish operations would be readily apparent in the	Overall, alternative C would result in a long-term, moderate, adverse impact on visitor experience and recreation in the project area for an additional 10 years because continued commercial shellfish operations within Drakes Estero (the primary resource area) would be readily apparent and would affect many visitors to the Seashore. The impacts would somewhat inhibit visitor enjoyment of resources for which the Seashore was established. DBOC operations would be generally unchanged under alternative C, for an additional 10 years, despite some modifications proposed to	As described above, alternative D would result in a long-term moderate adverse impact on visitor experience and recreation within the project area for an additional 10 years because continued commercial shellfish operations within Drakes Estero (the primary resource area) would be readily apparent and would affect many visitors to the Seashore. The impacts would somewhat inhibit visitor enjoyment of resources for which the Seashore was established. Under alternative D, the visitor experience and recreational opportunities provided by DBOC would be

TABLE ES-4. SUMMARY OF ENVIRONMENTAL CONSEQUENCES (CONTINUED)

Alternative A	Alternative B	Alternative C	Alternative D
Action/Impact	Action/Impact	Action/Impact	Action/Impact
<p>annual visitors to the Seashore and other opportunities to experience an active commercial shellfish operation are provided in the immediate area. In addition, commercial shellfish operations are not considered a visitor service, a requirement for concession contracts within the Seashore. The cumulative impact would be beneficial, and alternative A would contribute an appreciable increment to the overall beneficial cumulative impacts.</p> <p>With respect to visitor experience and recreation, alternative A is consistent with relevant law and policy because removal of DBOC would not represent the loss of a visitor service. Visitor services are defined by law as public accommodations, facilities, and services that are necessary and appropriate for public use and enjoyment of the Seashore (36 C.F.R. §51.3).</p>	<p>project area, and would be particularly adverse for visitors looking to enjoy solitude and primitive or unconfined type recreation within wilderness. Onshore and offshore structures and associated debris related to shellfish operations could detract from the views of Drakes Estero, especially during low tide when offshore equipment such as racks and bags are visible. Motorized boats also would continue to operate in Drakes Estero, which detracts from the natural soundscapes of the Seashore. The approximately 2.5 percent of visitors to the Seashore who are interested in experiencing an active commercial shellfish operation may consider alternative B to have a beneficial impact. However, the primary focus of DBOC is the commercial operation for sale of shellfish to restaurants and the wholesale shellfish market outside the park. These are not commercial services being offered to the visiting public to further the public's use and enjoyment of the park. Additionally, as described in alternative A, other opportunities to visit active shellfish operations are provided near the project area. The cumulative impact would be long-term moderate adverse, and alternative B would contribute an appreciable adverse increment to the cumulative impact.</p> <p>With respect to visitor experience and recreation, this alternative does not further the goals of relevant law and policy. Visitor services must be consistent, to the highest practicable degree, with the preservation and conservation of the resources and values of the Seashore (16 U.S.C. §§5951(b), 5952; 36 C.F.R. §51.3) (definition of "visitor service"). DBOC's operations are not consistent with the values for which Drakes Estero was congressionally designated as wilderness.</p>	<p>the existing facilities and production levels. The visitor experience and recreational opportunities at the site would be similar to current conditions, except that the existing, unpermitted picnic area would be removed and would be replaced by NPS. Visual and sound disturbances associated with commercial shellfish operations would be readily apparent in the project area, and the impact would be particularly adverse for visitors looking to enjoy solitude and primitive, unconfined type recreation within the Seashore. Onshore and offshore structures and associated debris related to shellfish operations could detract from the views of Drakes Estero, especially during low tide when offshore equipment such as racks and bags are visible. Motorized boats also would continue to operate in Drakes Estero, which detracts from the natural soundscapes of the Seashore. The approximately 2.5 percent of visitors to the Seashore who are interested in experiencing an active commercial shellfish operation may consider alternative C to have a beneficial impact. The primary focus of DBOC is the commercial operation for sale of shellfish to restaurants and the wholesale shellfish market outside the park. These are not commercial services being offered to the visiting public to further the public's use and enjoyment of the Seashore. Additionally, as described in alternative A, other opportunities to visit active shellfish operations are provided near the project area. The cumulative impact would be long-term moderate adverse, and alternative C would contribute an appreciable adverse increment to the cumulative impact.</p> <p>With respect to visitor experience and recreation, alternative C does not further the goals of relevant law and policy. Visitor services must be consistent, to the highest practicable degree, with the preservation and conservation of the</p>	<p>generally similar to current conditions, despite proposed modifications to existing facilities and operations. Similar to alternatives B and C, visual and sound disturbances associated with commercial shellfish operations would be readily apparent in the project area, and this impact would be particularly adverse for visitors seeking solitude and a primitive, unconfined type of recreation. These adverse impacts would be greater than under alternatives B and C due to the increased production limits (approximately 40 percent greater than alternative B and 70 percent greater than alternative C), which would likely increase motorized boat activity and the quantity of bags and associated mariculture items within Drakes Estero. Additionally, in the short-term, construction activities associated with alternative D could result in additional adverse impacts on visitor experience and recreation in Drakes Estero. In particular, such activities could further disturb soundscapes and views within Drakes Estero. The approximately 2.5 percent of visitors to the Seashore who are interested in experiencing an active commercial shellfish operation may consider alternative D to have a greater beneficial impact than the other alternatives. However, the primary focus of DBOC is the commercial operation for sale of shellfish to restaurants and the wholesale shellfish market outside the park. These are not commercial services being offered to the visiting public to further the public's use and enjoyment of the park. Additionally, as described in alternative A, other opportunities to visit active shellfish operations are provided near the project area. The cumulative impact on visitor experience and recreation would be long-term moderate adverse, and alternative D would contribute an appreciable adverse increment to the cumulative impact.</p>

TABLE ES-4. SUMMARY OF ENVIRONMENTAL CONSEQUENCES (CONTINUED)

Alternative A	Alternative B	Alternative C	Alternative D
Action/Impact	Action/Impact	Action/Impact	Action/Impact
		resources and values of the Seashore (16 U.S.C. §§5951(b), 5952; 36 C.F.R. §51.3) (definition of "visitor service"). DBOC's operations are not consistent with the values for which Drakes Estero was congressionally designated as wilderness.	With respect to visitor experience and recreation, alternative D does not further the goals of relevant law and policy. Visitor services must be consistent, to the highest practicable degree, with the preservation and conservation of the resources and values of the Seashore (16 U.S.C. §§5951(b), 5952; 36 C.F.R. §51.3) (definition of "visitor service"). DBOC's operations are not consistent with the values for which Drakes Estero was congressionally designated as wilderness.
<b>Socioeconomic Resources</b>			
Overall, alternative A would result in long-term minor adverse impacts on regional socioeconomic resources. DBOC staff and their families would experience a direct, adverse impact under alternative A due to the loss of jobs and housing. However, from a regional perspective, these impacts would be minimal, and would not affect the overall regional economy. DBOC staff comprises 0.01 percent of the Marin County population and 2.9 percent of the Inverness population (U.S. Census Bureau 2005–2009). Jobs lost in connection with the closure of DBOC make up only a small percentage of the total labor force for Marin and Sonoma counties and Inverness, and even with the added job loss, assuming these jobs are not replaced by expanded mariculture operations elsewhere, unemployment rates within Marin County and Inverness CDP would be well below statewide averages, at 7.9 percent and zero percent respectively (U.S. Census Bureau 2005–2009). In addition, the relocated households encompass a small percentage of the total households in the surrounding communities (less than 0.01 percent of the housing in Marin County and 0.4 percent of the homes in Inverness) (U.S. Census Bureau 2005–2009). Therefore, even if all former staff	Overall, alternative B would result in long-term beneficial impacts on socioeconomic resources due to the continued operation of a commercial shellfish facility within Drakes Estero for another 10 years. DBOC would continue to provide employment and housing to DBOC staff and their families. DBOC's contribution to the regional tax base would not change substantially from current levels (taxes are based on production levels), and DBOC would continue to provide a local food source for the region, for an additional 10 years, in quantities similar to current distribution. Additionally, it is assumed that visitor spending at the Seashore would continue at current levels. The cumulative impact on both the regional economy and statewide shellfish production would be long-term beneficial, and alternative B would contribute a noticeable beneficial increment to the cumulative impact.	Overall, alternative C would result in long-term beneficial impacts on socioeconomic resources due to the continued operation of a commercial shellfish facility within Drakes Estero for another 10 years. DBOC would continue to provide employment and housing to DBOC staff and their families. DBOC's contribution to the regional tax base (which is based on production rates) would not change substantially and DBOC would provide a local food source for the region, for an additional 10 years, in quantities similar to current distribution. Additionally, it is assumed that visitor spending at the Seashore would continue at current levels. The cumulative impact on both the regional economy and statewide shellfish production would be long-term beneficial, and alternative C would contribute a noticeable beneficial increment to the cumulative impact.	Overall, alternative D would result in long-term beneficial impacts on regional socioeconomic resources. Option 1 of alternative D would not change the availability of housing for DBOC staff and their families. In contrast, Option 2 of alternative D, which would include the elimination of four on-site housing units, would have an adverse direct impact on DBOC staff and the families that live on site.  Under both options, DBOC would maintain its contributions to the regional economy in a manner similar to current conditions, for an additional 10 years, with some exceptions.  The potential for increased shellfish production under alternative D could result in an increase in DBOC staff, providing additional jobs for local workers. Although the new facilities at DBOC could minimally increase visitation to shellfish operation, it is assumed that visitor spending associated with the Seashore as a whole would continue at current levels.  The relocated households proposed under Option 2 represent a very small percentage of the total



TABLE ES-4. SUMMARY OF ENVIRONMENTAL CONSEQUENCES (CONTINUED)

Alternative A	Alternative B	Alternative C	Alternative D
Action/Impact	Action/Impact	Action/Impact	Action/Impact
<p>relocates to another community and/or county, the impact on the regional economy would be minimal. Additionally, it is assumed that the Seashore, as a whole, would continue to contribute to the regional economy, at current levels, through local spending (approximately \$86 million in 2009) and by supporting jobs (resulted in \$13 million in added value to the region in 2009) (NPS 2011d). The cumulative impact on the regional economy would be long-term minor adverse, and alternative A would contribute a noticeable adverse increment to the cumulative impact.</p> <p>Alternative A could result in long-term major adverse impacts to California's shellfish market because DBOC produces 16–34 percent of the oysters harvested in California and 13–28 percent of the total shellfish grown in the state. The cessation of commercial shellfish operations within Drakes Estero would be highly noticeable and could substantially influence the production of shellfish in California. The cumulative impact on the California shellfish market would be long-term minor adverse, and alternative A would contribute a noticeable adverse increment to the cumulative impact.</p>			<p>households in the surrounding communities (less than 0.01 percent of the housing in Marin County and 0.4 percent of the homes in Inverness) (U.S. Census Bureau 2005–2009). Therefore, even if all DBOC staff that currently reside in on-site housing move to another community and/or county, the impact on the regional economy would be minimal. Additionally, some short-term jobs would be created once new onshore facilities are approved by the NPS and developed by DBOC. The cumulative impact on the regional economy would be long-term beneficial, and alternative D would contribute a noticeable beneficial increment to the cumulative impact.</p> <p>Both Option 1 and Option 2 of alternative D would result in long-term beneficial impacts to shellfish production in California because DBOC would continue to contribute to the statewide shellfish market for an additional 10 years. Additionally, the increased production limits proposed under this alternative would allow DBOC to cultivate more diverse and larger quantities of shellfish, including the purple-hinged rock scallop and the Olympia oyster, which are not currently produced at DBOC. These increased production limits could result in DBOC increasing their contribution to the California shellfish market. The cumulative impact on statewide shellfish production would be long-term beneficial, and alternative D would contribute a noticeable beneficial increment to the cumulative impact.</p>
<b>NPS Operations</b>			
Overall, alternative A would result in long-term minor adverse impacts on NPS operations because impacts would be slightly detectable but would not hinder the overall ability of the NPS to provide services, manage resources, or operate the Seashore. Additional NPS staff would be	Overall, alternative B would result in long-term minor adverse impacts on NPS operations because this alternative would require establishment of one staff position to coordinate park oversight and enforcement of the existing operations. The NPS would oversee and enforce	Overall, alternative C would result in a long-term minor adverse impact on NPS operations because this alternative would require establishment of one staff position to coordinate park oversight and enforcement of the existing operations. The NPS would oversee and enforce	Overall, alternative D would result in long-term minor adverse impacts on NPS operations because this alternative would require establishment of one dedicated staff position to coordinate park oversight and enforcement of the existing operations as well as an additional staff

TABLE ES-4. SUMMARY OF ENVIRONMENTAL CONSEQUENCES (CONTINUED)

Alternative A	Alternative B	Alternative C	Alternative D
Action/Impact	Action/Impact	Action/Impact	Action/Impact
required for monitoring/enforcing Drakes Estero during boat closure periods (estimated approximately 1-2 FTE); however, such efforts would not hinder the overall ability of the NPS to provide services, manage resources, or operate the Seashore. The cumulative impact would be long-term minor adverse, and alternative A would contribute noticeable adverse increment to the overall cumulative impact.	all aspects of the operation within the permit area. The staff increase under alternative B represents less than 1 percent of the overall FTE employed by the Seashore. These impacts would be slightly detectable but would not hinder the overall ability of the NPS to provide services, manage resources, or operate the Seashore. The cumulative impact would be long-term minor adverse, and alternative B would contribute a noticeable adverse increment to the overall cumulative impact.	all aspects of the operation within the permit area. The staff increase under alternative C represents less than 1 percent of the overall FTE employed by the Seashore. These impacts would be slightly detectable but would not hinder the overall ability of the NPS to provide services, manage resources, or operate the Seashore. The cumulative impact would be long-term minor adverse, and alternative C would contribute a noticeable adverse increment to the overall cumulative impact.	position to coordinate NEPA compliance for the proposed onshore development. The NPS would oversee and enforce all aspects of the operation within the permit area. The staff increase under alternative D represents less than 2 percent of the overall FTE employed by the Seashore. These impacts would be slightly detectable but would not hinder the overall ability of the NPS to provide services, manage resources, or operate the Seashore. The cumulative impact on NPS operations would be long-term minor adverse, and alternative D would contribute a noticeable adverse increment to the cumulative impact.

## **CONSULTATION AND COORDINATION**

A combination of activities, including public scoping, formal public meetings, internal workshops and agency briefings, has helped to guide NPS in developing the EIS.

## **SCOPING PROCESS AND PUBLIC PARTICIPATION**

Scoping is a process that allows the agency to discuss the proposed action with stakeholders, interested and affected parties, and the public, as well as internally with agency personnel. To determine the scope of issues to be analyzed in depth in this EIS, internal meetings were conducted with Seashore staff, three public scoping meetings were held at different locations in the vicinity of the Seashore during the public scoping period, and relevant agency consultations were initiated.

### **Internal Scoping**

An internal scoping meeting was held in September 2010 to initiate the EIS process and to define the initial scope of the EIS. Attendees included Seashore officials, DOI Solicitor's Office, representatives from NPS Pacific West Region, NPS Environmental Quality Division, and their contractors. Following the public and agency scoping period described below, the interdisciplinary planning team considered public comments for use in the development and refinement of project purpose and need, issues, impact topics, alternatives, and impact analysis for the EIS.

### **Public Scoping and Outreach**

The public scoping period was open for a total of 50 days between October 8, 2010, and November 26, 2010. An NPS press release was published by Bay Area news outlets on October 5, 2010, announcing the dates, times, and places of the public scoping meetings. On October 8, 2010, NPS sent a scoping letter to more than 500 interested individuals and organizations notifying them of the opportunity to comment, and the NPS Planning, Environment, and Public Comment (PEPC) web-site was activated as a vehicle for the public to submit comments. The Federal Register published a Notice of Intent (NOI) to prepare an EIS on October 22, 2010 (NPS 2010d). The public comment period officially closed on November 26, 2010. More than 4,000 comment letters were submitted to NPS during the public comment period. On January 31, 2011, NPS posted the Public Comment Analysis Report and all public correspondence on-line at [http://www.nps.gov/pore/parkmgmt/planning\\_dboc\\_sup\\_scoping\\_comments.htm](http://www.nps.gov/pore/parkmgmt/planning_dboc_sup_scoping_comments.htm). Comments received during the public scoping process helped to inform the range of alternatives, as well as the impact topics to be addressed by the EIS.

In addition, in keeping with a statement of principles that was signed by DBOC and NPS in 2008, NPS met with DBOC during the scoping process to discuss DBOC's interest in obtaining a permit under section 124. In addition to this meeting, DBOC submitted scoping comments and other information regarding its operation during the initial scoping period and in subsequent requests through March 15, 2011. NPS fully considered DBOC's interests in developing the range of alternatives and impact topics that are addressed in this EIS.

## COOPERATING AGENCIES

In accordance with NEPA (42 U.S.C. 4321-4370h) and the CEQ regulations sections 1501.5 and 1501.6, NPS invited the California Coastal Commission (CCC), CDFG, EPA, NMFS, San Francisco Bay Regional Water Quality Control Board, USACE, the Marine Mammal Council (MMC), and USFWS to be cooperating agencies for the EIS process. Four agencies have entered into an agreement with NPS to be cooperating agencies in the development of the EIS: CDFG, USACE, NMFS, and the EPA. Each of these cooperating agencies has special technical expertise related to the issues under consideration in the EIS.

## AGENCY CONSULTATION

In addition to collecting comments from the public, NPS also initiated scoping with relevant agencies. Letters were sent out to notify the agencies of the intent to begin preparation of the EIS and to solicit agency comments and suggestions regarding the proposed project and its potential environmental effects on resources under their respective jurisdictions. The agencies were asked to identify issues that should be analyzed in the EIS, determine the appropriate scope of the environmental analysis, identify potential management actions to be taken should the project commence, and determine whether agency permits or approvals would be required.

In addition to establishing which agencies would serve as cooperating agencies, as described above, other agencies were consulted to aid in identification of potential issues to be addressed in the EIS.

Consultation was undertaken in accordance with the following laws and policies:

- Coastal Zone Management Act Consistency (CCC and NOAA's Office of Ocean and Coastal Resource Management)
- Magnuson-Stevens Act Consultation (NMFS)
- Marine Mammal Protection Act Consultation (NMFS)
- Section 7 Consultation (USFWS, NPS, and NMFS)
- Section 106 Consultation (SHPO, Advisory Council on Historic Preservation)
- State Clearinghouse (NPS)
- Tribal Consultation (The Federated Indians of Graton Rancheria)

## ENDNOTES

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<sup>i</sup> Letter from Field Solicitor, San Francisco Field Office, U.S. Department of the Interior, to Point Reyes National Seashore, February 26, 2004, regarding the Point Reyes Wilderness Act.

“This memorandum opinion reviews the Point Reyes wilderness situation as it related to the Johnson Oyster Company 40-year Reservation of Use and Occupancy with expires in 2011, or might be terminated sooner for cause or other processes. The Wilderness Act of 1964, and the Point Reyes Wilderness Act of 1976, provide the guidance for implementation of wilderness within the Seashore and are the basis for the NPS’s obligations to manage the subject land and waters toward conversion of the potential wilderness areas to wilderness status.”

<sup>ii</sup> Letter from Field Solicitor, San Francisco Field Office, U.S. Department of the Interior, to Point Reyes National Seashore, February 26, 2004, regarding the Point Reyes Wilderness Act.

“Further, the Park Service’s Management Policies clearly state that the Park Service must make decisions regarding the management of potential wilderness even though some activities may temporarily detract from its wilderness character. The Park Service is to manage potential wilderness as wilderness to the extent that existing non-conforming conditions allow. The Park Service is also required to actively seek to remove from potential wilderness the temporary, non-conforming conditions that preclude wilderness designation.

Hence, the Park Service is mandated by the Wilderness Act, the Point Reyes Wilderness Act and its Management Policies to convert potential wilderness, i.e., the Johnson Oyster Company tract and adjoining Estero, to wilderness status as soon as the non conforming use can be eliminated.”



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# ACRONYMS AND ABBREVIATIONS

<b>ACHP</b>	Advisory Council on Historic Preservation
<b>ANSI</b>	American National Standards Institute
<b>BAAQMD</b>	Bay Area Quality Management District
<b>CARB</b>	California Air Resources Board
<b>CCC</b>	California Coastal Commission
<b>CCCBR</b>	Central California Coast Biosphere Reserve
<b>CDFG</b>	California Department of Fish and Game
<b>CDPH</b>	California Department of Public Health
<b>CEQ</b>	Council on Environmental Quality
<b>CFGC</b>	California Fish and Game Commission
<b>CFR</b>	Code of Federal Regulations
<b>CNPS</b>	California Native Plant Society
<b>CSLC</b>	California State Lands Commission
<b>CWA</b>	Clean Water Act
<b>CZMA</b>	Coastal Zone Management Act
<b>dBA</b>	A-weighted decibel scale
<b>DBOC</b>	Drakes Bay Oyster Company
<b>DO</b>	Director's Order
<b>DOE</b>	Determination of Eligibility
<b>DOI</b>	U.S. Department of the Interior
<b>EA</b>	environmental assessment
<b>EIS</b>	environmental impact statement
<b>EPA</b>	U.S. Environmental Protection Agency
<b>EQD</b>	Environmental Quality Division (NPS)
<b>ESA</b>	Endangered Species Act
<b>FEMA</b>	Federal Emergency Management Agency
<b>FES</b>	final environmental statement
<b>FHWA</b>	Federal Highway Administration
<b>FIGR</b>	The Federated Indians of Graton Rancheria
<b>FONSI</b>	finding of no significant impact
<b>FTA</b>	Federal Transit Administration
<b>FTE</b>	full-time equivalent

<b>GMP</b>	general management plan
<b>GPS</b>	global positioning system
<b>Harbor District</b>	Humboldt Bay Harbor, Recreation, and Conservation District
<b>IBA</b>	Important Bird Area
<b>IPCC</b>	Intergovernmental Panel on Climate Change
<b>ISO</b>	International Organization for Standardization
<b>JOC</b>	Johnson Oyster Company
<b>MBTA</b>	Migratory Bird Treaty Act
<b>MMC</b>	Marine Mammal Commission
<b>MLPA</b>	Marine Life Protection Act
<b>MMPA</b>	Marine Mammal Protection Act
<b>MPA</b>	Marine Protected Area
<b>MSX</b>	multinucleated sphere unknown
<b>MTC</b>	Metropolitan Transportation Commission
<b>NAS</b>	National Academy of Sciences, National Research Council
<b>National Register</b>	National Register of Historic Places
<b>NAVD-88</b>	North American Vertical Datum of 1988
<b>NEPA</b>	National Environmental Policy Act
<b>NHPA</b>	National Historic Preservation Act
<b>NMFS</b>	National Marine Fisheries Service (NOAA)
<b>NOAA</b>	National Oceanic and Atmospheric Administration
<b>NOI</b>	Notice of Intent
<b>NO<sub>x</sub></b>	nitrogen oxides
<b>NPCA</b>	National Parks Conservation Association
<b>NPS</b>	National Park Service
<b>NRC</b>	National Research Council
<b>OCRM</b>	Office of Ocean and Coastal Resource Management (NOAA)
<b>Pb</b>	lead
<b>PCSGA</b>	Pacific Coast Shellfish Growers Association
<b>PEIR</b>	Programmatic Environmental Impact Report
<b>PEPC</b>	Planning, Environment, and Public Comment web-site (NPS)
<b>PFMC</b>	Pacific Fishery Management Council
<b>PL</b>	Public Law
<b>PM<sub>2.5</sub></b>	particulate matter less than 2.5 micrometers
<b>PRNSA</b>	Point Reyes National Seashore Association
<b>PSP</b>	paralytic shellfish poison
<b>PVC</b>	polyvinylchloride
<b>ROD</b>	record of decision

<b>ROG</b>	reactive organic gas
<b>RUO</b>	reservation of use and occupancy
<b>scallops</b>	purple hinged rock scallops ( <i>Hinnites multirugosus</i> )
<b>Seashore</b>	Point Reyes National Seashore
<b>Secretary</b>	Secretary of the Interior
<b>section 124</b>	Section 124 of Public Law 111-88 of the Department of the Interior, Environment, and Related Agencies Appropriations Act of 2010
<b>SHPO</b>	State Historic Preservation Officer
<b>Solicitor's Office</b>	U.S. Department of the Interior Solicitor's Office
<b>SSC</b>	special species of concern
<b>SUP</b>	special use permit
<b>USACE</b>	U.S. Army Corps of Engineers
<b>U.S.C.</b>	U.S. Code
<b>USDA</b>	U.S. Department of Agriculture
<b>USFWS</b>	U.S. Fish and Wildlife Service
<b>VOCs</b>	volatile organic compounds
<b>Volpe</b>	John A. Volpe National Transportation Systems Center

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