2

ALTERNATIVES

Photo by: Robert Campbell

2

ALTERNATIVES

INTRODUCTION

Consistent with NEPA, this EIS explores a reasonable range of alternatives, including a no-action alternative (40 CFR 1502.14). This chapter presents one no-action alternative, under which DBOC's operations would end after the existing authorization for DBOC expires on November 30, 2012, and three action alternatives, under which the Secretary would exercise the discretion granted to him under section 124 to issue a new 10-year SUP to DBOC to operate in Drakes Estero for a period of 10 years through November 30, 2022. This EIS also analyzes the impacts that these alternatives could have on the human environment. "Chapter 4: Environmental Consequences" of this EIS presents the results of these analyses.

The alternatives include both broad-scale and site-specific elements. In some instances, sufficient detail is available to analyze site-specific impacts. In other cases, information is not available, or plans are insufficiently developed, to allow detailed analysis. In the latter case, a conceptual level of analysis has been conducted. Depending on the alternative selected, the level of detail available during the preparation of this EIS and the impacts identified, some specific actions may be implemented without additional evaluation under NEPA, subsequent to the completion of this EIS process. In other cases, additional design of proposed concepts and evaluation of a reasonable range of alternatives would be required.

ALTERNATIVES DEVELOPMENT

The alternatives presented in this EIS were developed taking into consideration the results of internal discussions, review of public 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 this EIS, DBOC comments, responses, and submittals to other agencies were reviewed. In addition, DBOC conducted a site tour with the authors (DBOC [Lunny], pers. comm., 2011h). 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).

The action alternatives analyzed in this document were selected based on their ability to address the purpose of and need for action and project objectives and because they allow analysis of a full and reasonable range of alternatives. As set forth in chapter 1, the purpose of and need for action in this EIS is based on the Secretary's discretionary authority under section 124 of PL 111-88.

The alternatives are described in detail in the following sections. A side-by-side comparison of the alternatives is presented in table 2-5 (provided at the end of this chapter). Alternative elements suggested during public scoping that were either technically or economically infeasible and/or did not meet the purpose of and need for the project were considered and dismissed from further analysis and are discussed later in this chapter.

The NPS evaluated four alternatives in this EIS:

- **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, the NPS would convert the area to wilderness. 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.

- **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 the 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. 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.

- **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. 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.

- **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 this 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. 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.

EXISTING CONDITIONS

Development of the action alternatives is based on the scope and scale of the existing DBOC operations and facilities, as authorized by the existing RUO and 2008 SUP. In order to provide context for the alternatives considered in this EIS, this section describes DBOC operations and facilities both offshore within Drakes Estero and onshore. The term offshore is used to refer to operations and facilities in Drakes Estero, including intertidal areas such as the shoreline and mudflats. Discussion of onshore operations and facilities generally refers to those areas above mean high tide but also may include items that stretch into the intertidal area, such as the main dock.

DBOC operates within the Seashore under authorizations issued by the NPS. This approval takes the form of the current SUP and RUO. The existing SUP was signed on April 22, 2008 and expires concurrently with the 40-year RUO on November 30, 2012. Copies of these documents can be found in appendix A. DBOC also has mariculture leases from CDFG. These are Lease M-438-01 and Lease M-438-02. The 2008 SUP references these leases for the shellfish species that NPS authorized for cultivation within Drakes Estero.

SPECIAL USE PERMIT AREA AND MARICULTURE SPECIES

The 2008 SUP authorized DBOC to generally operate within the same offshore boundaries as contained in Lease M-438-01 (1,049 acres[1]) and Lease M-438-02 (1 acre). Lease M-438-01 is split into two parcels: Parcel 1 contains 343 acres on the east side of Drakes Estero and Parcel 2 contains 706 acres on the west side of Drakes Estero. Within these offshore lease boundaries, DBOC maintains approximately 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 described later in this section (i.e., hanging culture or bottom culture). The specific numbered culture beds that make up the 142 acres of growing area are derived from maps provided by DBOC (DBOC 2010c[i]) and are shown on figure 2-1.

The lease boundaries were drawn prior to creation of the harbor seal protection areas designated in the 2008 SUP. Another concern with the original lease boundaries is that they were drawn without the aid of technology. It should be noted that the lease boundaries were also identified in the SUP as the offshore permit area. DBOC asserts that the original mapping mistakenly excluded five of the racks in Bed 6 that were in existence at the time (DBOC 2011e[ii]). Although most correspondence has cited five racks outside of the existing lease areas, the GIS data provided by DBOC and being used to support the development of this EIS indicates six racks outside the lease boundaries.

In May of 2010, DBOC submitted a request to the CFGC for a boundary adjustment to Lease M-438-01 to include the six racks currently outside the lease boundaries and to exclude some of the lease area within the harbor seal protection areas (DBOC 2010h[iii]). The area where Bed 6 extends outside the existing boundaries of Lease M-438-01 can be seen on figure 2-1.

Figure 2-1 also shows the areas of Drakes Estero in which boat traffic is known to take place (more detail on this aspect of operations is provided later) and the harbor seal protection areas. The onshore areas in which DBOC is authorized to operate are described in the DBOC operations and facilities section below.

Mariculture Species

DBOC currently grows, processes, and sells two species of shellfish: Pacific oyster and Manila clam. This section describes the species currently grown and/or authorized by current permits in Drakes Estero.

[1] 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.

Pacific Oysters. Pacific oysters, native to Japan, are cultivated only within shellfish growing areas depicted on the map provided by DBOC (DBOC 2008b[iv]) (see figure 2-1 for lease boundaries and specific culture beds). Cultivation of Pacific oysters within Drakes Estero has been authorized in some form since the 1930s, and it was one of the two oyster species (along with European flat oysters) identified by CDFG in 1979, when CDFG began to specify which individual species were authorized in each lease. According to tax records for 2007 through 2009, the average annual production of Pacific oysters by DBOC within Drakes Estero has been 454,036 pounds per year (approximately 5.34 million oysters harvested per year). This reflects a conversion from the number of oysters harvested (as reported in official DBOC Proof of Use reports and privilege use tax records submitted to CDFG) to pounds of shucked oyster meat. Within Drakes Estero, CDFG has used the standard of 100 Pacific oysters per gallon as the term of measurement. This conversion calculates the number of Pacific oysters divided by 100 (this represents gallons harvested). In other areas of the state, CDFG uses 140 Pacific oysters per gallon as the standard conversion (CDFG [Ramey], pers. comm., 2011d). In order to convert gallons to pounds, gallons are multiplied by a factor of 8.5 pounds per gallon (CDFG [Ramey], pers. comm., 2011d). Additional details on production levels in Drakes Estero between 1980 and 2010 are provided in table 2-1 at the end of this section.

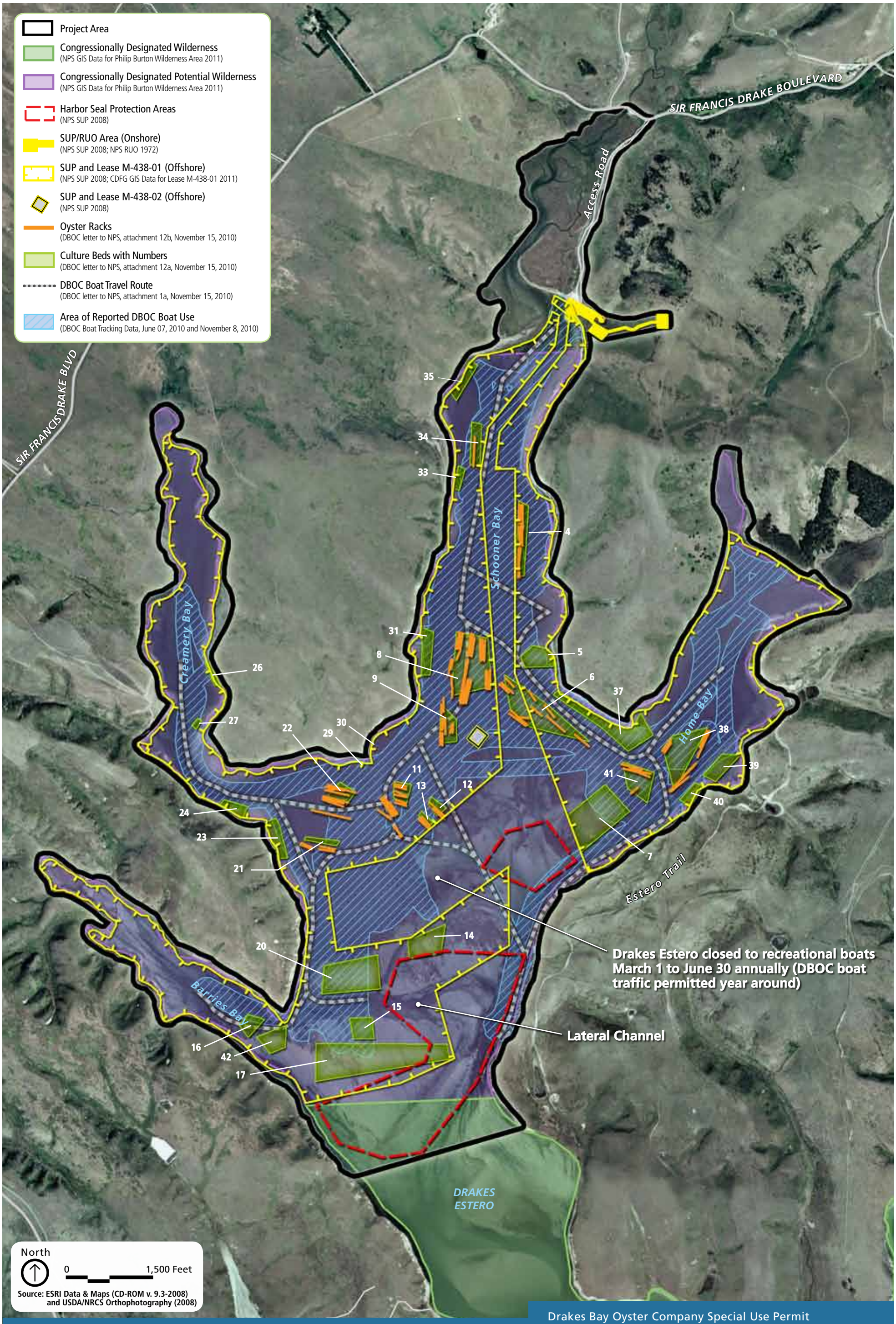
Pacific oyster (*Crassostrea gigas*). (Photo courtesy of VHB.)

European Flat Oysters. European flat oysters, native to Europe, have been included in Lease M-438-01 since 1979 and are permitted in the 2008 SUP. DBOC does not currently cultivate this species. According to records submitted by DBOC to CDFG, DBOC has never sold or planted European flat oysters. Small numbers of this species still existed within the area of Lease M-438-01 as of January 2008. DBOC has advised that these are remnants of prior plantings by JOC (DBOC 2008b[v]). The last record of European flat oysters being sold at the site is from April 1968 (CDFG 2011c).

European flat oyster (*Ostrea edulis*). (Photo courtesy of http://genimpact.imr.no/species/european_flat_oyster.)

Kumamoto Oysters. Kumamoto oysters, native to Japan, have not been permitted for culture in Drakes Estero since 1979. DBOC does not currently cultivate this species. According to records submitted by DBOC to CDFG, DBOC has never sold nor planted Kumamoto oysters. Small numbers of this species still existed within Lease M-438-01 as of January 2008. DBOC has advised that these are remnants of prior plantings by JOC and were removed by DBOC (DBOC 2008b[vi]). DBOC does not plan to plant Kumamoto oysters in the future, due to their slow growth and has communicated to CCC that it has removed the remnants from Drakes Estero (DBOC 2008b[vii]).

Kumamoto oysters (*Crassostrea sikamea*). (Photo courtesy of http://www.chefs-resources.com is licensed.)



Drakes Bay Oyster Company Special Use Permit
Environmental Impact Statement

National Park Service
U.S. Department of the Interior

Point Reyes National Seashore

FIGURE 2-1

Existing Conditions (Offshore Operations)

Olympia Oysters. Olympia oysters (*Ostreola conchaphila*), native to the California coast, have not been permitted for culture in Drakes Estero since 1979. These oysters require hard substrate on which to grow (Couch and Hassler 1989; Trimble, Ruesink, and Dumbauld 2009) and therefore are unlikely to occur naturally in the soft-bottom estuary that is Drakes Estero. The last record of Olympia oysters being sold at this site was from July 1963.

Olympia oysters (*Ostreola conchaphila*). (Photo courtesy of http://www.chefs-resources.com is licensed.)

Purple-hinged Rock Scallops. Lease M-438-02 was originally established by CDFG in 1979 for JOC to culture purple-hinged rock scallops, which are native to the California rocky coast. At the time this lease was issued, CDFG noted that purple-hinged rock scallops "do not occur naturally within the biota of the lease area" (CDFG 1979b). According to tax records, purple-hinged rock scallops have never been sold by DBOC. The last record of scallops being sold at this site was from May 1994 (CDFG 2011c).

Purple-hinged rock scallops (*Crassadoma gigantea*). (Photo courtesy of L. Schroeder; http://www.bily.com/pnwsc/web-content/Photos/Bivalves.)

Manila Clams. Manila clams, native to the Philippines, were added to Lease M-438-02 in 1993. In December of 2009, CFGC amended the lease to allow cultivation of Manila clams within Lease M-438-01 per a request from DBOC. DBOC did not submit a request for this expansion of species cultivation to NPS, as required by section 4(b)(vi) of the 2008 SUP (NPS 2008b). NPS advised DBOC that additional information was required before NPS could determine whether to approve this modification (NPS 2009e[viii]). DBOC declined to offer any additional information in their response to the NPS (DBOC 2009c[ix]). Manila clam cultivation in the area of Lease M-438-01 has not been authorized by NPS.

Manila clam (*Venerupis philippinarum*). (Photo courtesy of http://www.squaxin-nr.org/page/15/.)

In 2006, DBOC reported planting 1 million Manila clam seeds within Lease M-438-02 (CDFG 2006). In their 2009 and 2010 proof of use reports submitted to CDFG, DBOC reports harvest of Manila clams in Lease M-438-01 (primarily in Bed 7) (CDFG 2009a, 2010a). DBOC reported harvest of Manila clams on their privilege use tax forms beginning in February 2009 for Lease M-438-01 (see table 2-1) (CDFG 2009a). CDFG reports that the conversion factor for Manila clams is 30 clams per pound (CDFG [Ramey], pers. comm., 2011d). The average annual harvest of Manila clams, according to 2009 and 2010 privilege use tax forms, has been 571 pounds per year (see table 2-1). A total of 458 pounds (13,740 clams) were harvested in 2009, and 684 pounds (20,520 clams) were harvested in 2010.

Additional background on Manila clam culture within Drakes Estero can be found in the "Shellfish Mariculture in Drakes Estero" section of chapter 1.

TABLE 2-1. SHELLFISH SPECIES PRODUCTION BY YEAR (1980–2010)

Year	Species Production (pounds per year)[b]		
	Pacific Oyster [d]	Manila Clam [e]	Purple-hinged Rock Scallop
1980	223,329	0	1,730
1981	353,209	0	72
1982	410,253	0	647
1983	435,022	0	664
1984	591,118	0	308
1985	590,130	0	0
1986	467,544	0	0
1987	643,195	0	0
1988	639,175	0	0
1989	543,303	0	0
1990	562,148	0	0
1991	570,010	0	0
1992	670,591	0	0
1993	661,683	0	850
1994	684,293	0	550
1995	445,706	0	0
1996	587,172	0	0
1997	476,867	0	0
1998	292,188	0	0
1999	62,875	0	0
2000	34,094	0	0
2001	131,352	0	0
2002	156,126	0	0
2003	232,186	0	0
2004[a]	96,754	0	0
2005[a]	138,958	0	0
2006	352,960	0	0
2007	466,533	0	0
2008	436,848	0	0
2009	458,726	458	0
2010	585,277	684	0

Source: Privilege use tax records submitted to CDFG by JOC (prior to 2004) and DBOC (after 2005).

[a] Tax records are unavailable for 2004 and 2005. These records are based on estimates by the CDFG Marine Region Aquaculture Coordinator in a March 30, 2007, report.

[b] Tax records indicate that these were the only species produced during the time period shown (no European flat oysters or Kumamoto oysters were reported during this time).

[c] Although some tax records may not specify species harvested and some reports may contain errors, this document relies upon production data provided by CDFG as the source for DBOC production (CDFG 2011c).

[d] Pacific oyster weight calculated from total harvest. In Drakes Estero, CDFG based weight using conversion of 100 oysters per gallon and 8.5 pounds per gallon.

[e] Manila clam weight calculated from total harvest. CDFG measures weight using conversion of 30 clams per pound.

Production Limit. Section 4(b)(i) of the 2008 SUP states that "production of all shellfish species shall be capped at the 'current production level' as determined under the California Coastal Commission Consent Order No. CCC-07-CD-04." Section 3.2.10 of CCC Consent Order No. CCC-07-CD-04, states that production of all shellfish species shall be capped at the "current production level." To establish this "current production level," CCC required that DBOC provide documentation, "including the amount harvested in the last year and any projected increases in yield for the coming year" (CCC 2007b). In their

2008 letter to the CCC on the subject of production limit, DBOC projected a maximum total production of shellfish at 850,000 pounds annually and suggested that the limit be based on that level (DBOC 2008b[x]). In their September 10, 2008, response, the CCC stated, "Commission staff finds that the harvest of 850,000 lbs of shellfish by DBOC would represent a substantial increase over current production levels. Commission staff does not find sufficient evidence within your January 31, 2008 letter to support an assumption that current production would be 850,000 lbs of shellfish" (CCC 2008). To date, CCC has not established a production limit for DBOC. According to privilege use tax reports, the average production between 2007 and 2009 was 454,188 pounds of shellfish (including Pacific oyster and Manila clam) per year. In 2010, DBOC harvested 585,961 pounds of shellfish. As described, this EIS evaluates various levels of production of shellfish including 500,000 pounds, 600,000 pounds, and 850,000 pounds.

DBOC OPERATIONS AND FACILITIES

The following sections describe existing DBOC operations and facilities. This includes descriptions of activities and structures relevant to DBOC commercial shellfish operations as they currently exist, categorized by offshore and onshore. As mentioned above, the term offshore is used to refer to operations and facilities in Drakes Estero, including intertidal areas such as the shoreline and mudflats. Discussion of onshore operations and facilities generally refers to those areas above mean high tide but also may include items that stretch into the intertidal area, such as the main dock. DBOC is acquiring after-the-fact authorization for some unpermitted buildings/structures as part of their efforts to comply with the SUP and coastal development regulations.

Many aspects of DBOC's commercial shellfish operation, and its attendant use of mechanized equipment and manmade infrastructure in Drakes Estero, constitutes a nonconforming use of wilderness. Section 4(c) of the Wilderness Act identifies prohibited uses, otherwise known as nonconforming uses, in wilderness. Nonconforming uses include a prohibition on commercial enterprises, mechanized equipment such as motorboats, and manmade structures. More detail on nonconforming uses can be found in the wilderness sections of chapters 3 and 4.

Offshore Operations and Facilities

All of DBOC's offshore commercial shellfish operations take place within the areas designated by CDFG as Lease M-438-01 (1,049 acres) and Lease M-438-02 (1 acre within the), with the exception of six culture racks (discussed below) that are outside the boundary of the SUP and leases. Lease M-438-01 is split into two parcels: Parcel 1 contains 343 acres on the east side of Drakes Estero and Parcel 2 contains 706 acres on the west side of Drakes Estero. Of the 1,050 acres within the leases and SUP, DBOC cultivates shellfish within approximately142 acres in Drakes Estero. These 142 acres comprise 42 numbered culture beds (see figure 2-1). This represents the total area in which shellfish may be grown; however, DBOC does not necessarily use all 142 acres at once; some beds may lie fallow. For instance, the proof of use report for 2010 reports planting of a total of 26.6 acres (CDFG 2010a). The operations described below are based primarily on communication with DBOC through letters and a February 16, 2011, site visit (DBOC [Lunny], pers. comm., 2011h).

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. Culture beds, in which racks and/or bags are placed, are distributed throughout Lease M-438-01. Table 2-2 summarizes which culture types take

place in which beds and figure 2-1 depicts the location of racks and culture beds. 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. According to information on the racks provided by DBOC, just over half (53 percent) of the racks are currently in poor condition (DBOC 2010e[xi]). The DBOC spreadsheet had a combined column for poor repair and not in use; however, during a recent site visit, DBOC indicated that racks in poor repair may be used to support floating culture methods described below (DBOC [Lunny], pers. comm., 2011h).

Racks used for hanging culture are made up of bents (the vertical boards anchored in the substrate) and stringers (the horizontal boards on which oysters are strung), as seen during low tide. (Photo courtesy of

The wooden racks are made up of bents and stringers. Based on a review of available photos, most of the racks are constructed of pressure-treated dimensional lumber. The DBOC spreadsheet indicates that the racks are supported by a total of 2,139 bents spaced at 12-foot intervals (DBOC 2010e[xii]). The bents are anchored in the bed of the Estero and provide the primary structural support for the racks. Generally, the bents consist of three 2-foot by 6-foot boards sunk into the substrate and held together by a 2-inch by 4-inchand 2-inch by 6-inch cap board. Stringers are installed over the tops of the bents and are the boards that hold the strings of oysters. Six stringer boards make up the top of the rack for the entire length of the rack. The approximate width of the racks is 12 feet. The stringers are generally 2-inch by 4-inch or 2-inch by 3-inch boards. Individual stringer boards are installed with overlap that is estimated at 25 percent.

Wooden racks in relatively good repair support “off-bottom” culture methods such as Japanese hanging culture and the French tube culture. In Japanese hanging culture, oysters are grown on recycled left valves (shells), and these shells are strung along wires through holes punched in the recycled shell. Clumps of approximately 14 shells are separated by approximately 6 inches of polyvinylchloride (PVC) piping to allow for cluster development. These wires are completely suspended and should not make contact with the bottom of Drakes Estero. From the time oysters are initially placed on the racks, they require approximately 16 to 18 months to reach market size, depending on environmental conditions. DBOC indicated to CCC in March 2010 that it had replaced Japanese hanging culture with French tube culture (DBOC 2010f[xiii]) (described below); however, in their November 2010 submittal to NPS, DBOC described Japanese hanging culture as one of the culture methods being used and was identified in Drakes Estero by DBOC staff during a recent site visit (DBOC 2010a[xiv], [Lunny], pers. comm., 2011h).

Japanese hanging culture in Drakes Estero. (Photo courtesy of VHB.)

French tube culture in Drakes Estero. (Photo courtesy of VHB.)

In French tube culture, oysters are grown directly on the tubes. These tubes, known as French tubes, are roughly coated in concrete. As in Japanese hanging culture, the tubes are hung on the racks, and it takes approximately 12 months for oysters to reach market size. Both of these hanging cultures are used for growth of oyster clusters. These clusters generally require an additional three months on intertidal areas for shell hardening prior to processing (DBOC 2010a[xv]).

Tray used for culture in Drakes Estero (trays are stacked when installed in Drakes Estero). (Photo courtesy of VHB.)

DBOC grows single oysters and clams within bags and trays. Trays and bags can be suspended as a type of hanging culture using racks or Styrofoam floats. Hanging culture with trays and bags is generally used for the purpose of seed rearing single oysters (the process of growing larval oyster stages to maturity). Otherwise, bags are set on sandbars or shoreline intertidal areas.

Setting bags on sandbars or shoreline intertidal areas is a form of bottom culture. Bags are used both for the nursery stage of oyster growth (following initial attachment to substrate and growth in the setting tanks on shore) and for the "grow-out" stage (the stage where young mature oysters reach market size). A common bag type used is a 3-foot by 2-foot rubber mesh bag. Trays are 3 feet by 3 feet. Table 2-2 provides a breakdown of which culture types take place in which beds (bed numbers are provided on figure 2-1), along with the acreage of each bed.

Although JOC used stake culture in the past, DBOC has not provided information regarding this method and is not known to use this method; therefore, it is not addressed in this EIS.

Bottom bag culture in Drakes Estero, anchored with cinder blocks. Photo taken during low tide conditions when sand bars are exposed. (Photo courtesy of NPS.)

Floating bag culture in Drakes Estero. (Photo courtesy of NPS.)

DBOC also has experimented with other seed methods. In 2009, structures containing stacked French tubes were placed in Drakes Estero. DBOC states that this method is no longer used (DBOC 2011f[xvi]). According to section 4(b)(ii) of the SUP, DBOC must obtain prior approval from the NPS before any additional aquaculture cultivation infrastructure is constructed. Furthermore, construction of improvements or alterations is subject to NPS approval under section 6 of the SUP; however, DBOC is responsible for cyclic maintenance to ensure that all facilities are maintained in a "safe, sanitary and sightly condition" in accordance with section 19 of the SUP (NPS 2008b).

DBOC has divided the areas in which they cultivate shellfish into the 42 culture beds described above and displayed on figure 2-1. These 42 beds total approximately 142 acres, according to GIS estimates, which are based on PDF versions of bed locations provided by DBOC. In a separate file where the racks alone are described, DBOC estimates that there are a total of 7 acres of racks (including the six racks outside Lease M-438-01) installed in Drakes Estero (DBOC 2010e[xvii]). This more conservative estimate of rack acreage is used throughout the EIS instead of adding the acreages of beds above because a sum of all beds supporting rack culture would overstate the acreage which may be directly impacted by racks. For instance, Bed 8 encompasses 13 acres and includes 22 racks. Bed 8 is listed as being used for rack culture alone; however, the boundary of Bed 8 is drawn around the racks, which take up a smaller proportion (approximately 2.16 acres) of the bed.

The list of bed sizes and culture type (as shown in table 2-2) is the only source of information available by which a total acreage of bottom bag culture can be estimated. Based on this information, a maximum of 88 acres of bottom bags may be placed within Drakes Estero at any given time. The actual number varies year to year and is likely to be less than 88 acres because rack culture also is used in some of these beds and some beds are left fallow for a time. Additionally, according to DBOC proof of use reports for 2009 and 2010, DBOC planted 22 acres of bags in each year (CDFG 2009a and 2010a). The length of time a bag stays in Drakes Estero varies depending on the species being cultivated and on environmental conditions; however, it is generally between 18 and 24 months. Bags are turned by hand approximately once a month to remove accumulated sediment that can interfere with oyster growth and may ultimately result in oyster mortality. Turning the bags also reduces the likelihood of oyster shells growing together to form a cluster. Clams are better suited to being covered in sediment; therefore, clam bags are generally not flipped during grow-out (DBOC [Lunny], pers. comm., 2011h).

TABLE 2-2. CULTURE TYPE BY BED NUMBER

Bed Number	Culture Type		Acreage
1	ND		ND
2	ND		ND
3	ND		ND
4	Racks		4.63
5	Bottom bags		3.59
6	Racks		12.43
7	Bottom bags	Floating bags	13.54
8	Racks		13.52
9	Racks		3.41
10	ND		ND
11	Racks		1.92
12	Racks		1.06
13	Racks		0.61
14	Bottom bags		5.30
15	Bottom bags	Floating bags	2.98
16	Bottom bags		1.88
17	Bottom bags	Floating bags	23.46
18	ND		ND
19	ND		ND
20	Bottom bags	Floating bags	11.66
21	Racks		2.45
22	Racks		2.86
23	Bottom bags		1.57
24	Bottom bags		0.68
25	ND		ND
26	Bottom bags		1.57
27	Bottom bags	Floating bags	0.30
28	ND		ND
29	Bottom bags		ND
30	Bottom bags		ND
31	Bottom bags		2.96
33	Bottom bags		0.98
34	Racks		2.75
35	Bottom bags		1.91
36	ND		ND
37	Bottom bags	Floating bags	8.15
38	Racks	Floating bags	8.24
39	Bottom bags	Floating bags	2.91
40	Bottom bags		1.59
41	Racks	Floating bags	4.90
42	Bottom bags		3.22

Source: DBOC 2010d[xviii]

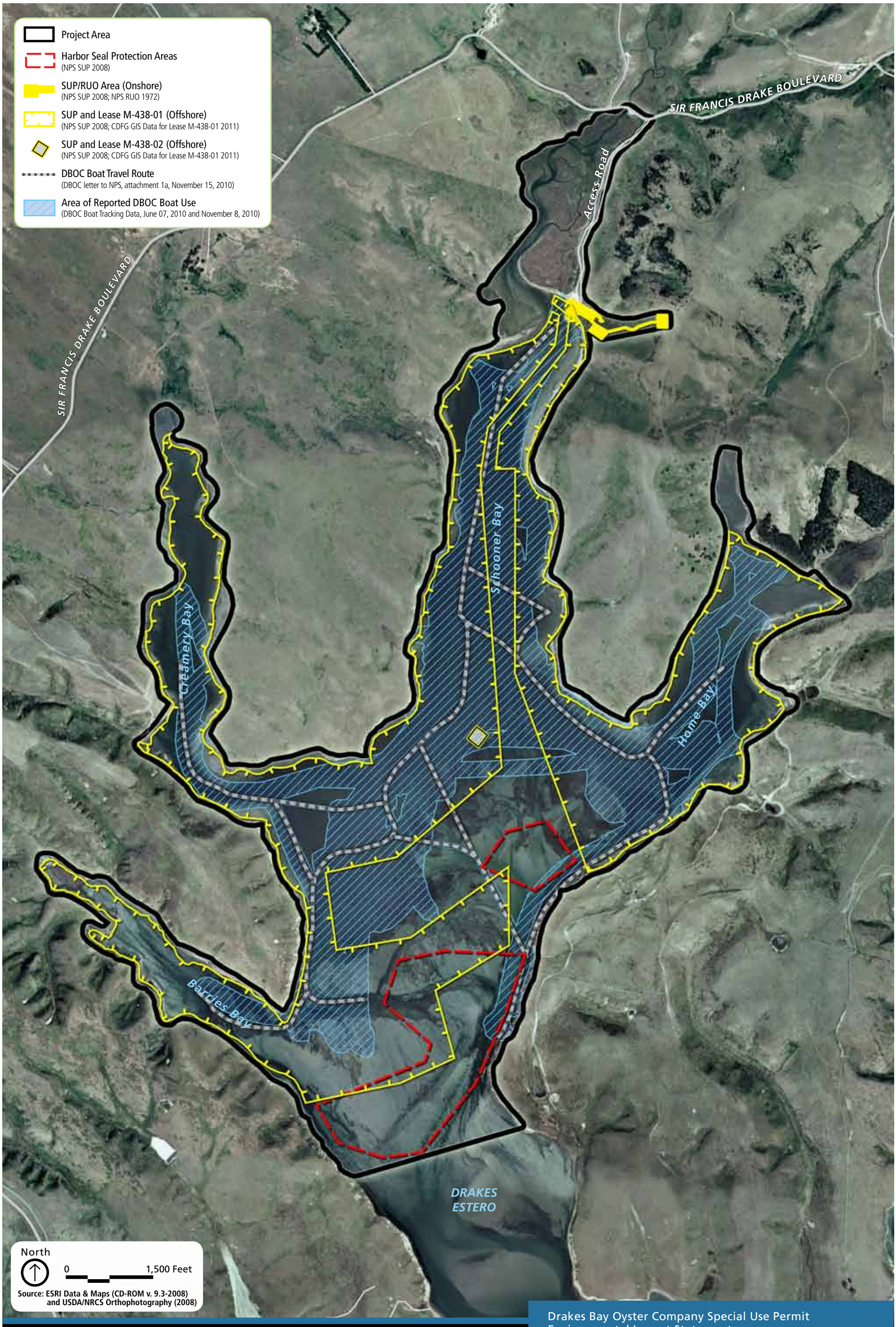
ND = no data

According to DBOC, bags in areas with strong currents are anchored to the Estero bottom using PVC piping (DBOC did not specify the length of the PVC anchors), although cinder blocks have also been observed functioning as anchors (see photo above). Anchored lines may be left in place for subsequent planting in the same area. Bags in areas with little current are left unanchored (DBOC 2010b[xix]).

Elements of offshore structures are subject to damage by weather events. Weather-related damage may result in dispersal of items such as Styrofoam floats, treated lumber displaced from racks, and PVC piping throughout Drakes Estero and along the shoreline. NPS has received a number of comments from visitors claiming to have observed large amounts of mariculture-related debris in Drakes Estero. For instance, during public scoping one commenter submitted photographs to support his observation of the debris associated with mariculture activities in Drakes Estero. DBOC asserts that it makes a serious effort to maintain structures and retrieve any debris from its operations.

The offshore racks and bags are accessed via motorboat. DBOC currently operates two motorboats within Drakes Estero: one is 16 feet long with a 20-horsepower 4-stroke engine, while the other is 20 feet long with a 40-horsepower 4-stroke engine. These boats operate up to 8 hours per day, 6 days per week, making approximately 12 round trips per day (DBOC [Lunny], pers. comm., 2011h). The photograph below shows boat tracks through algae in Drakes Estero (as photographed in May of 2007), which demonstrates how boats access racks off of established boat routes. Figure 2-2 provides the known area of boat use and the boat travel route provided by DBOC (see discussion below).

Aerial photo of Drakes Estero (May 2007) showing boat tracks through algae.
(Photo courtesy of Robert Campbell.)



Drakes Bay Oyster Company Special Use Permit
Environmental Impact Statement

National Park Service
U.S. Department of the Interior

Point Reyes National Seashore

FIGURE 2-2

DBOC Boat Use

When not in use, these boats are docked at the main dock described in the section "Onshore Operations and Facilities" below. DBOC also has two nonmotorized barges (8 feet by 30 feet and 8 feet by 17 feet) that are often used to transport materials (including shellfish) within Drakes Estero. DBOC has not established permanent moorings (i.e., locations where vessels are secured to the bottom) for these barges in Drakes Estero. DBOC states that the barges are anchored in deep water or tied to the dock. Each barge has its own anchor (DBOC 2011f[xx]). DBOC boats generally travel along the boat travel route, as submitted to CCC (shown on figure 2-2); however, there are some variations in travel routes based on tides, weather, eelgrass, and harbor seal restrictions. Many of the beds are only exposed at lower tides requiring boat access at that time. DBOC has asserted a preference for avoiding eelgrass but claims that this is not always possible (DBOC [Lunny], pers. comm., 2011h). Although section 4(b)(iv) of the 2008 NPS SUP required that DBOC submit a vessel transit plan within 60 days of the signing of the SUP (the SUP was signed on April 22, 2008), DBOC has not yet done so.

DBOC boat travel (and areas of operation in general) is restricted by the harbor seal protection protocol associated with the existing SUP. This protocol prohibits DBOC operations (including placement of bags) within the established harbor seal protection areas (see figure 2-1) and requires a number of other restrictions to minimize disturbance of harbor seals by DBOC staff and boats, including seasonal closure of the lateral channel and maintenance of a 100-yard buffer from any hauled-out harbor seal at any time.

In November 2010, during the initial planning stages for this EIS, DBOC provided boat transit materials to the NPS along with two days of GPS tracking data (June 7, 2010 and November 8 2010) for their boats. The NPS requested more comprehensive boat tracking data but has not received any additional information from DBOC to date. DBOC gathered this data using Garmin GPS Map 76 handheld GPS units, which are used to spatially track each boat's location and path at all times.

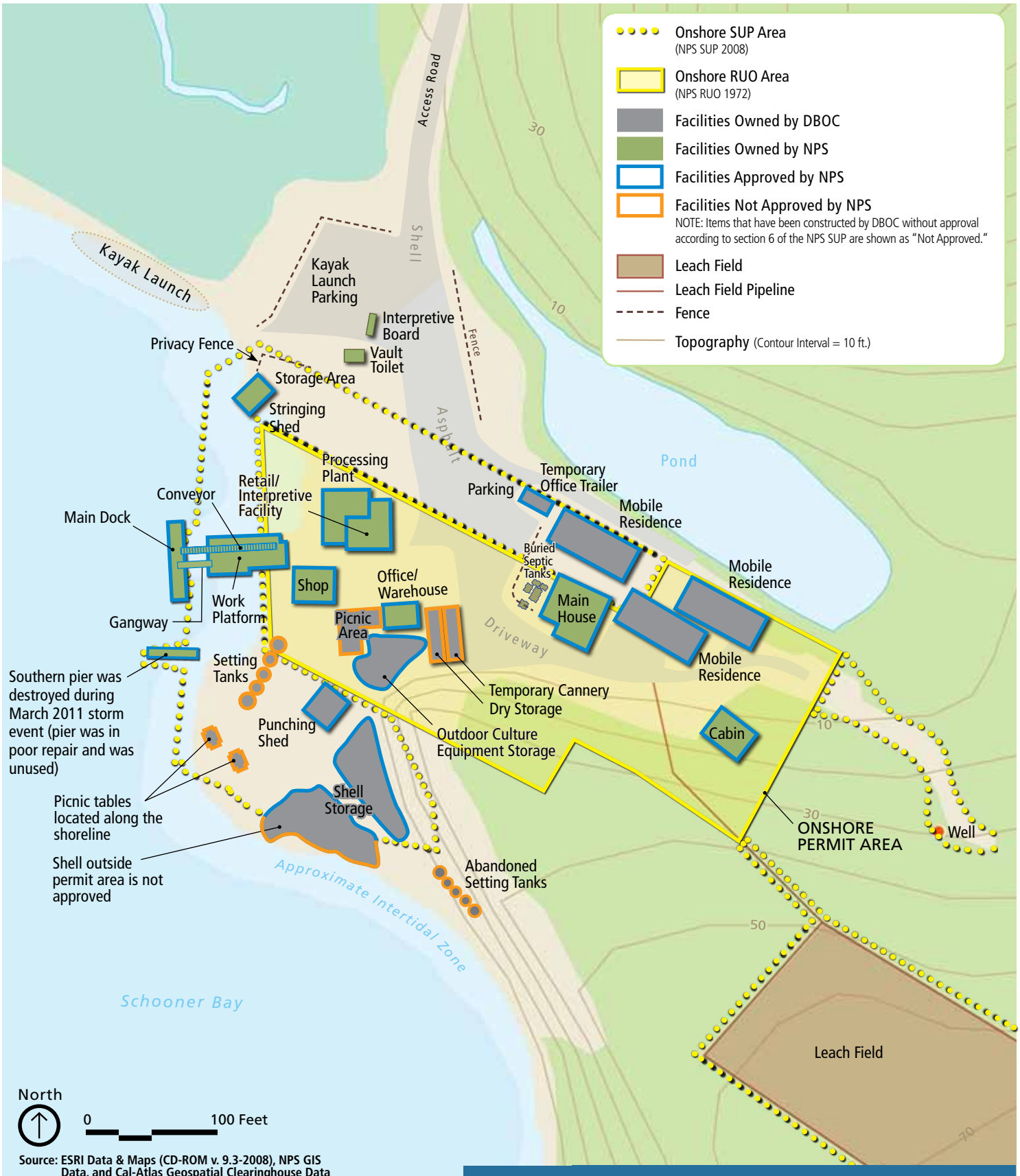
Figure 2-2 shows the linear boat travel route combined with a compilation of the GPS data for the two days of data provided to NPS by DBOC. The data was provided in PDF format and at a relatively coarse resolution. In addition, the width of the boat use area is shown approximately 60 feet wide, which may represent an area greater than where boats actually travel. However, considering that only two days of data were provided, the total area of actual use is unknown. The total area of boat use estimated by this compilation of available data is approximately 740 acres.

As shown on figure 2-2, some boat travel takes place outside the boundaries of the current permit area. The purpose of most of the DBOC boat travel outside the SUP boundaries is to cross between Parcel 1 and Parcel 2 of Lease M-438-01 and to directly access culture beds. In addition, boat travel in the southern area of Drakes Estero east of the harbor seal protection areas is currently necessary because a CDPH water sampling site is located within one of the seal protection areas. (Additional detail on water sampling sites is contained in the water quality section of chapter 3.)

Onshore Operations and Facilities

DBOC onshore facilities support the processing, sale, and initial stages of shellfish culture (figure 2-3). 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 2-4). DBOC facilities currently outside the authorized area include unused setting tanks and some of the oyster shell storage mounds. The existing onshore facilities and their approximate size, ownership, and purpose are summarized in table 2-3 and are depicted on figure 2-3. DBOC is in the process of acquiring after-the-fact authorization for some unpermitted buildings/structures to comply with coastal development regulations. In order for these facilities to be approved by CCC, approval also must be given by the NPS. These unpermitted facilities, constructed without first obtaining a coastal development permit from the CCC and without approval from the NPS, are identified and evaluated within the project alternatives.

Onshore DBOC facilities (photo taken before the March 2011 storm event). (Photo courtesy of Janene Caywood.)



Source: ESRI Data & Maps (CD-ROM v. 9.3-2008), NPS GIS Data, and Cal-Atlas Geospatial Clearinghouse Data

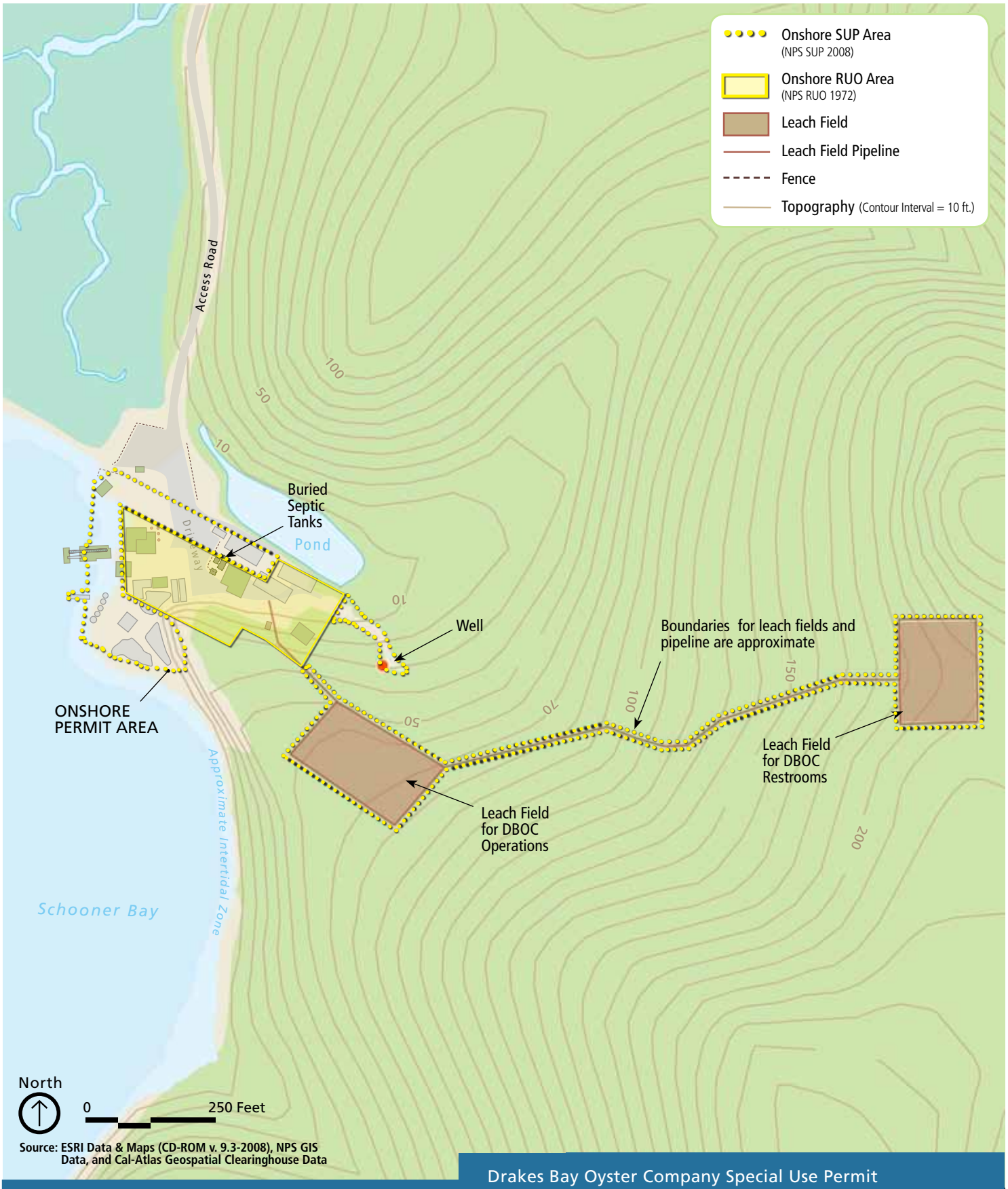
Drakes Bay Oyster Company Special Use Permit
Environmental Impact Statement

National Park Service
U.S. Department of the Interior

Point Reyes National Seashore

FIGURE 2-3

Existing Conditions (Onshore Operations)



Source: ESRI Data & Maps (CD-ROM v. 9.3-2008), NPS GIS Data, and Cal-Atlas Geospatial Clearinghouse Data

Drakes Bay Oyster Company Special Use Permit
Environmental Impact Statement

National Park Service
U.S. Department of the Interior

Point Reyes National Seashore

FIGURE 2-4

Existing Water and Septic Utilities

TABLE 2-3. SUMMARY OF EXISTING ONSHORE FACILITIES AND OWNERSHIP STATUS

Building/Structure	Approximate Size[a] (feet)	Ownership	Purpose
Processing Plant	40 × 48	NPS[b]	The rear half of this building houses the inside setting tanks and the single oyster-packing facilities. The front half houses the retail and interpretive areas.
Office/Warehouse	16 × 24	NPS[b]	Due to its poor condition, this structure is currently only used for storage.
Temporary Office Trailer	8 × 20	DBOC	This structure serves as a business office.
Punching Shed	20 × 20	DBOC	This shed is used for preparation of shells for Japanese hanging culture.
Temporary Cannery[c]	8 × 40	DBOC	This shipping container houses the cannery facility.
Temporary Storage[c]	8 × 40	DBOC	This shipping container is used for dry storage.
Setting Tanks[c] (5 units)	10.5 diameter (2 units) 8 diameter (3 units)	DBOC	These five fiberglass tanks are used for growing larvae to a size where they can be transferred to Drakes Estero.
Main Dock and Ramps[d]	Floating dock:12 × 60 Two ramps: 4 x 15	NPS	This is the main dock serving DBOC boats. It is composed of a floating dock connected to an onshore work platform by a gangway and a conveyor.
Work Platform[d]	Pier: 55 × 24	NPS	The platform is where harvested oysters are initially cleaned and sorted.
Southern Pier	6 × 24	DBOC (no longer applicable)	This small pier was destroyed in a recent (March 2011) high wind event. DBOC does not plan to rebuild this pier (DBOC 2011b[xxi]).
Shop	16 × 20	NPS[b]	This one-story structure serves as an employee break room.
Stringing Shed	17 × 24 (with 13 × 12 appendage)	NPS	This open-air shed is used for stringing punched shells onto wires for Japanese hanging culture.
Main House	40 × 50	NPS[b]	This house is the operation manager's residence.
Cabin	24 × 35	NPS[b]	This cabin provides employee housing.
Mobile Homes (3)	24 × 60 (each)	DBOC	These structures provide employee housing.
Picnic Area[c]	12 tables	DBOC	DBOC provides casual picnic areas for visitors both in a centralized area next to the office/warehouse and along the shoreline.

Note: Any new facility constructed by DBOC under a new SUP is considered personal property as defined by the SUP and removal would be the responsibility of DBOC at the expiration of the SUP.

[a] Sources for sizes are NPS measurements during a March 22, 2011, site visit and DBOC coastal development permit application materials (DBOC 2009b[xxii]).

[b] NPS ownership is according to item purchased from JOC, itemized in the August 25, 1972, Public Voucher for Purchases and Services Other Than Personal (Requisition Number CX800032073).

[c] These structures and facilities have not been permitted by the NPS.

[d] These facilities were damaged during a high wind event in March 2011. Any replacement of these facilities that is not consistent with the existing structure in terms of footprint and materials would be considered personal property of DBOC. DBOC would have to remove such structures at the end of the permit term. Following the high wind event, DBOC sought emergency approval to construct a new concrete work platform and dock, but withdrew the application in May 2011.

DBOC does not produce shellfish larvae on site. Instead, DBOC imports shellfish from off-site growers. DBOC reports that they import shellfish in the form of larvae (and seed) from CDFG-certified sources in compliance with a "Long-term Permit to Import Live Aquatic Animals into California" issued by the CDFG. CDFG-certified hatcheries are located in Hawaii and along the U.S. west coast. DBOC's 2006 proof of use report shows that 1 million Manila clam seeds were imported and planted in Lease M-438-02. These seeds were acquired from Kona Coast Shellfish in Hawaii. For Pacific oyster larvae and seed, CDFG generally uses hatcheries on the west coast. For instance, for 2011, DBOC holds permits to import larvae/seed from Taylor Shellfish Farms in Washington (Permit MR-L-10-029) and Whiskey Creek Shellfish Hatchery in Oregon (Permit MR-L-10-028). However, they have also used seed from Coast Seafood in California and Kona Coast Shellfish in Hawaii. The sources from which CDFG has authorized DBOC to import larvae and/or seed are summarized in table 2-4.

TABLE 2-4. DBOC LONG-TERM PERMITS TO IMPORT LIVE AQUATIC ANIMALS INTO CALIFORNIA

Permit Number	Date of Issue[a]	Supplier	City	State	Source	Species
MR-L-10-029	12/07/2010	Taylor Shellfish Farms	Shelton	WA	Taylor Shellfish Farms	Pacific oyster
MR-L-10-028	12/07/2010	Whiskey Creek Shellfish	Tillamook	OR	Whiskey Creek Shellfish	Pacific oyster larvae
MR-L-08-038	09/02/2008	Coast Seafood	Bellevue	WA	Quilcene Hatchery	Pacific oyster larvae and seed
MR-L-08-039	09/02/2008	Whiskey Creek Shellfish	Tillamook	OR	Whiskey Creek Shellfish	Pacific oyster larvae
MR-L-08-044	10/27/2008	Coast Seafood	Kailua-Kona	HI	Coast Seafood	Pacific oyster
MR-L-07-014	06/23/2007	Whiskey Creek Shellfish	Tillamook	OR	Whiskey Creek Shellfish	Pacific oyster larvae
MR-L-07-018	08/03/2007	Coast Seafood	Bellevue	WA	Quilcene Hatchery	Pacific oyster larvae
MR-L-05-012	06/09/2005	Taylor Shellfish Farms	Shelton	WA	Taylor Shellfish Farms	Pacific oyster

Source: CDFG Long-term Permits to Import Live Aquatic Animals into California.

[a] Permits are good for 1 year from date of issue.

The setting tanks located onshore provide a location for remote setting. These tanks have not been permitted by NPS or CCC. Remote setting is a human-controlled process by which shellfish larvae imported for DBOC commercial shellfish operations are grown on site to a stage of maturity marked by attachment to cultch material, at which point the larvae become seed. The larval stage is the immature stage of development that occurs immediately after successful reproduction and egg fertilization. In the wild, larvae are carried by currents and have a free-swimming, mobile existence. The beginning of the seed stage is marked by the end of this mobile larval phase, when larvae develop anatomical "feet" used to attach to an immobile substrate. Once attached, shellfish larvae have reached maximum development for the larval stage and seed development begins. In essence, the term "seed" refers to a developmentally young shellfish that has become sessile (immobile), with no specific definition as to size (Quayle 1988). Manila clams are imported as seed and do not require remote setting. Seeds, placed within bags or trays, can be placed directly within Drakes Estero.

While growing oyster larvae in the onshore setting tanks, DBOC withdraws water from Drakes Estero for remote setting. Single oyster setting takes place in the processing building using microcultch (ground shells; described below). The water used for setting is withdrawn from Drakes Estero, filtered, heated to 23 to 25 degrees Celsius (73 to 77 degrees Fahrenheit), enriched with nutrients, and eventually discharged via underground pipes into Drakes Estero (DBOC [Lunny], pers. comm., 2011h). Cluster oyster setting takes place in the five outdoor setting tanks (two of these setting tanks are 10 feet in diameter and 4 feet deep and three of the tanks are 7 feet in diameter and 4 feet deep). After a four-day setting period at an elevated temperature, water from Drakes Estero is circulated through these tanks continuously at a rate of about 5 gallons per minute, with no need for added nutrients. On about day 7, the tanks are discharged directly into Drakes Estero (DBOC 2010f[xxiii]). DBOC does not have a permit for this discharge.

DBOC stores large piles of shell onshore. Currently, some of that shell is outside the permit area (see figure 2-3). Deposition of shell material at the site prior to DBOC occupancy has resulted in progressive fill of Drakes Estero and the marsh to the northeast of the onshore permit boundary. Placement of shell debris in the vicinity of the existing pond took place primarily between the 1950s and 1980s. Currently, shells are stored on site primarily for use in cultivation. Holes are punched in the left valves (shells) for use in Japanese hanging culture. Right valves (shells) are ground and used for microcultch, which is used for single oyster culture. According to DBOC, some of the shell has been donated offsite to the San Francisco Bay Native Oyster Restoration Project and the San Francisco Bay Bird Observatory Snowy Plover Habitat Enhancement Project (DBOC [Lunny], pers. comm., 2011h). French tubes are also stored on site prior to use. DBOC uses a small forklift (with a 60-horsepower engine) to move pallets of oyster shell and other cultivation materials.

Oyster shells are stockpiled on site. Note punching shed to the left. (Photo courtesy of VHB.)

DBOC packages its shellfish on site and operates the only on-site shellfish cannery in California. Shellfish and culture equipment are cleaned by scrubbing with seawater by hand or by pressurized washers along the conveyor belt when they are brought onshore from Drakes Estero. The water used in this process is drawn from and discharged directly into Drakes Estero. Cluster Pacific oysters (particularly those grown using the Japanese hanging culture method) must be broken apart with pneumatic hammers; French tube culture clusters can generally be broken apart with a mallet.

The breaking apart of clusters and rinsing of shellfish as they are brought in from Drakes Estero takes place at the main dock, the conveyors, and the attached work platform/pier. This structure was badly damaged in a March 2011 storm event. As this EIS was already in progress when the storm event occurred, the replacement of the dock, work platform, and associated ramps and conveyors are included in all action alternatives (described in more detail later in this chapter). Currently, all debris washed off these platforms returns directly to Drakes Estero.

Packing methods differ depending on the final product. Single oysters are placed by hand into containers and taken to one of the two on-site processing facilities. Because single oysters remain closed, they are processed in the back of the old processing plant as well as in the temporary cannery in the shipping container. High-quality oysters are separated for distribution to the raw half-shell market, while lower-quality oysters are separated for other single-shell distribution needs. Both are packed in mesh bags and stored in the walk-in refrigerator in the processing room.

Individual oysters are separated manually by size (oysters too small for distribution are placed back in Drakes Estero to grow further). Individual oysters are generally only suitable for shucked packing, which takes place in the cannery. Cleaned oysters are selected according to size and packed into jars with fresh well water. Cleaning and packing of Manila clams is the same as described for the single Pacific oysters.

DBOC sells their shellfish and "complementary food items" on site in the retail area of the processing plant, as allowed in the RUO. Unlined parking spaces for approximately 10 to 15 vehicles are provided in an asphalt parking lot in front of the retail facility. DBOC constructed this paving prior to the 2008 SUP signing and without NPS approval. Visitors purchasing food items at the site currently consume them on site at the picnic tables provided by DBOC. These picnic tables were not authorized by NPS. Approximately 80 to 90 percent of DBOC-produced oysters are distributed to local retailers within 100 miles of DBOC. DBOC deliveries are made using one of the company's two trucks: a 0.75 ton pickup truck and a 1.5-ton refrigerated box truck. Currently, Manila clams are only sold on site (DBOC [Lunny], pers. comm., 2011h).

The 2008 SUP and the 1972 RUO allow DBOC to provide interpretation of shellfish cultivation to the public in the onshore permit area. Formal tours may range from 5 people to school groups of 20. DBOC also provides informal presentations of the commercial operation and history of oyster cultivation in Drakes Estero. Tours are limited to onshore activities. Tours on the water are not allowed under existing NPS authorizations. Certain interpretive activities are subject to NPS approval and may require a separate SUP.

Five buildings on site provide staff housing with a total of 14 bedrooms in two permanent structures and three mobile homes to house staff (DBOC 2010k[xxiv]). The two permanent structures are the main house and the cabin. The main house serves as the operation manager's residence.

ELEMENTS COMMON TO ALL ALTERNATIVES

There are a number of elements common to all alternatives. 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 also be required to restore the 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)

Under alternative A, the SUP and RUO would expire on November 30, 2012. The Secretary would not take action to issue a permit to DBOC under section 124 of PL 111-88.

DBOC OPERATIONS AND FACILITIES

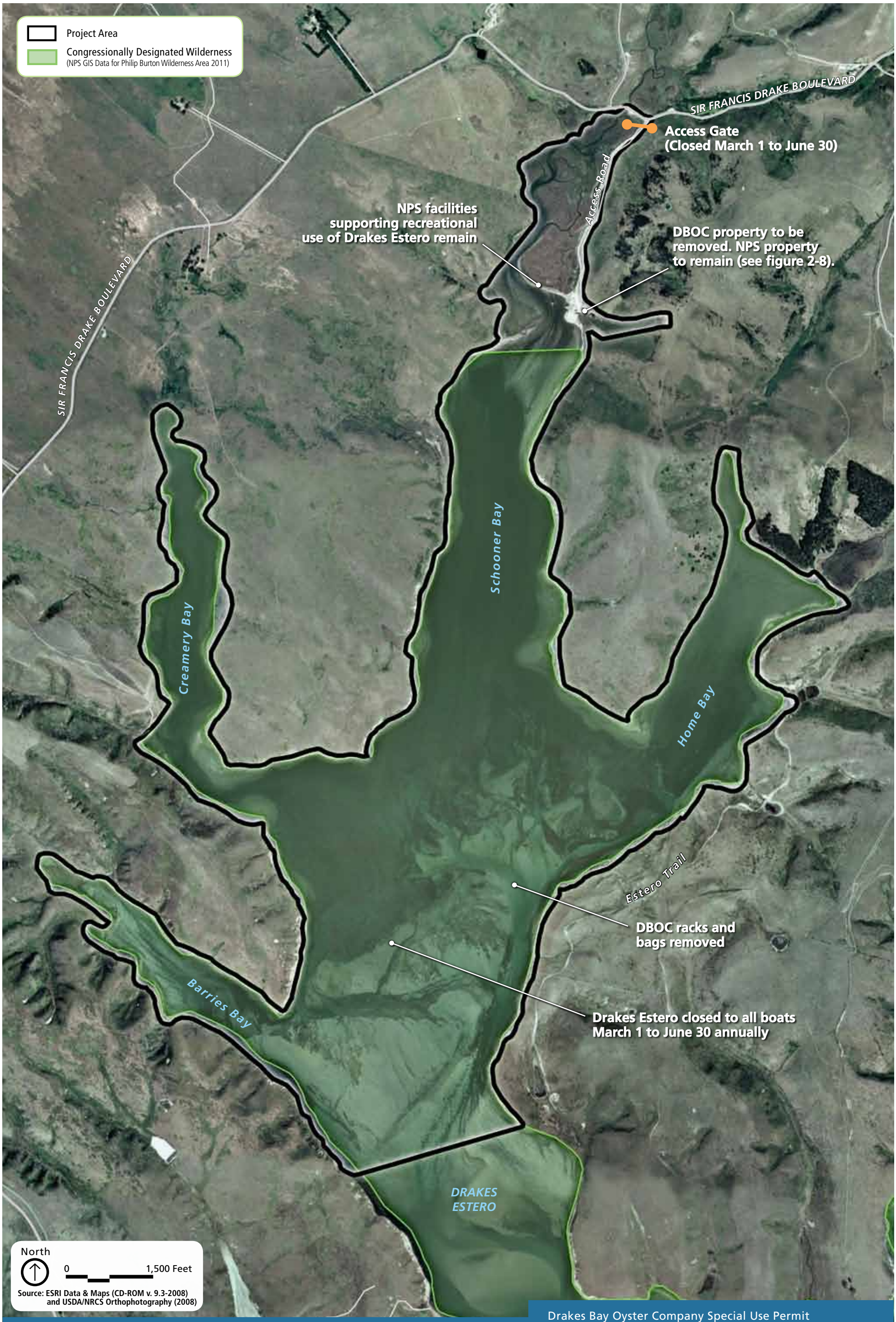
DBOC would cease to operate within the Seashore, and DBOC would remove certain buildings and structures, and all personal property associated with the oyster operation (including all racks, bags, and any other commercial shellfish operations-related items in Drakes Estero, as well as the shell mounds) from Drakes Estero and the adjacent land and restore the property to good order and condition, as set forth in the existing SUP and RUO. Section 23 of the SUP states:

> "At the conclusion of the Permittee's authorization to use the Premises for the Permitted Uses, Permittee shall surrender and vacate the Premises, remove Permittee's Personal Property therefrom, and repair any damage resulting from such removal. Subject to the approval of the Permitter, Permittee shall also return the Premises to as good order and condition (subject to ordinary wear and tear and damage that is not caused directly or indirectly by Permittee) as that existing upon [April 22, 2008]." (NPS 2008b)

Similarly, section 12 of the RUO states that at the end of the permit, DBOC would be required to "remove all structures and improvements placed upon the premises during the period of its reservation" (NPS 1972a). NPS would oversee all of DBOC's removal work and would work with DBOC to establish an orderly timetable and to ensure that the work is completed by November 30, 2012.

Amendment 2 to the 2004 Lease M-432-01 renewal required the establishment of an escrow account for removal of commercial shellfish operation equipment from the lease area "as a financial guarantee of growing structure or other lease improvement removal and/or cleanup expense in the event that the aforementioned aquaculture lease is abandoned or otherwise terminated" (CDFG 2005a). At the time of this EIS, CDFG has indicated that the account is not up to date and is working with DBOC to establish a new agreement for this issue (CDFG 2011b[xxv]).

Removal of commercial mariculture activities and infrastructure from Drakes Estero would end all uses that are inconsistent with wilderness designation. Once removed, NPS would convert the congressionally designated potential wilderness to congressionally designated wilderness, as described below. Figures 2-5 and 2-6 show the conditions both offshore and onshore following removal of commercial shellfish activities and structures under the no-action alternative.



Drakes Bay Oyster Company Special Use Permit
Environmental Impact Statement

National Park Service
U.S. Department of the Interior

Point Reyes National Seashore

FIGURE 2-5

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

Source: ESRI Data & Maps (CD-ROM v. 9.3-2008), NPS GIS Data, and Cal-Atlas Geospatial Clearinghouse Data

Drakes Bay Oyster Company Special Use Permit
Environmental Impact Statement

National Park Service
U.S. Department of the Interior

Point Reyes National Seashore

FIGURE 2-6

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

OTHER NPS OPERATIONS AND FACILITIES IN THE PROJECT AREA

Within the SUP area, some structures owned by NPS (all of which are outside the congressionally designated potential wilderness area) would remain on site and others would be removed. The main dock, work platform, stringing shed, and southern pier, damaged in a March 2011 storm event, would be removed. A determination of eligibility conducted for the structures within the project area concluded that the structures are not eligible for listing on the National Register due to lack of historic integrity (Caywood and Hagen 2011). In a letter dated August 4, 2011, SHPO concurred with this finding (see appendix D). Therefore, removal of these structures would not require approval from the SHPO. The remaining permanent structures consist of the processing plant, the shop, the office/warehouse, the main house, and the cabin. The NPS would evaluate these structures for removal or reuse in a future planning effort.

Outside of the SUP area, NPS would continue to maintain existing NPS facilities (the access road, a gravel parking lot, a vault toilet, and an interpretive board) for visitors. A gate would be installed at the intersection of the access road with Sir Francis Drake Boulevard to prevent all nonmotorized boat use (e.g., kayak, canoe) within Drakes Estero during harbor seal pupping season (March 1 to June 30). This would not represent a change in visitor use policy, as visitors would continue to have access to the shoreline and beach areas of Drakes Estero. The gate would provide a more efficient enforcement method to prevent nonmotorized boat use during the seasonal closure. Public fishing is limited within the Drakes Estero State Marine Conservation Area to recreational clam collection; no other fishing would be allowed, consistent with the conservation area restrictions.

Removal of commercial shellfish operations from Drakes Estero would end all uses that are inconsistent with full wilderness designation. This removal would allow the NPS to convert the approximately 1,363 acres of congressionally designated potential wilderness in Drakes Estero to congressionally designated wilderness. A notice would be published in the Federal Register attesting to the fact that all nonconforming uses of the congressionally designated potential wilderness area have been removed. Conversion to congressionally designated wilderness would be effective on the date of notice publication (PL 94-567). Recreational use of Drakes Estero by nonmotorized watercraft such as canoes and kayaks would continue to be allowed from July 1 to February 28, with all of Drakes Estero closed to recreational boaters during harbor seal pupping season, March 1 to June 30. Administrative use of motorized boats within Drakes Estero would be subject to evaluation under minimum requirements and minimum tool determination processes as required by the Wilderness Act. In each case, nonmotorized alternatives would be evaluated to determine whether they meet the specific management objective.

PHOTOGRAPHIC SIMULATIONS OF ALTERNATIVE A

The following photographic simulations provide visual examples of the project area before (existing conditions) and after (alternative A) the removal of DBOC onshore and offshore facilities and structures. Actual conditions following removal are predicted based on the surrounding area. Future conditions may vary somewhat from the depicted image.

View of existing onshore DBOC facilities facing north, taken during February 2011 site visit. (Photo courtesy of VHB.)

Photographic simulation of conditions along the eastern shoreline of Schooner Bay (looking north) following removal of DBOC facilities under alternative A.

View of existing oyster rack in Drakes Estero used by DBOC for Japanese hanging culture, as seen at low tide (during high tide, only the top of the racks—the stringers—are visible). (Photo courtesy of NPS.)

Photographic simulation of Drakes Estero, following removal of DBOC facilities under alternative A.

View of DBOC bottom bag culture methods used by DBOC for clams and oysters. Photo was taken during a 2009 low tide (during high tide, bags may be submerged). (Photo courtesy of NPS.)

Photographic simulation of Drakes Estero intertidal flat near the mouth of Home Bay during a low tide (alternative A).

ELEMENTS COMMON TO ALL ACTION ALTERNATIVES

There are a number of elements that would be common to all action alternatives. They are summarized here and restated under each alternative.

Under all action alternatives, 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. 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. In keeping with section 124's direction that the new authorizing instrument would be a SUP, a new RUO would not be issued. DBOC's ability to operate under the new permit would be contingent on annual fair market value payments to the United States and on DBOC's compliance with the terms of the permit.

The only entity with authority to authorize DBOC's use of tidal and subtidal lands within Drakes Estero is the NPS. This is because the tidal and subtidal lands within Drakes Estero are owned in fee by the United States. These lands were conveyed by the State of California to the United States in 1965. While California retained to the people the right to fish in Drakes Estero, this right extends only to the public's right to take wild fish (CDFG 2007b[xxvi]). Aquaculture products are private property and so cannot be part of a public fishery. Therefore, should the Secretary issue a permit to DBOC under section 124, as a condition of receiving that permit, 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. This would ensure that certain provisions relating to DBOC operations that are currently incorporated into the SUP by reference remain in force. CDFG would retain authority under Fish and Game Code to regulate the importation of aquatic organisms into the state by DBOC.

Under section 124, if the Secretary decides to issue a new permit to DBOC for 10 years, DBOC must pay the United States the fair market value of the federal property permitted to DBOC. A permit under section 124 would encompass the federally owned onshore and offshore areas used by DBOC. 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. This situation is avoided through the termination of the state water bottom lease. This new regulatory framework would be applied to DBOC operations if one of the action alternatives described in this EIS is selected by the Secretary.

Under all action alternatives, 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. This would include review of production levels, monitoring of boat operations, adherence to permit boundaries, etc.

As with the existing authorizations, prior to expiration on November 30, 2022, 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.

SPECIAL USE PERMIT AREA AND MARICULTURE SPECIES

Under all action alternatives, the boundaries of the permit area would be adjusted 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. Incorporating the racks and realistic travel routes would assist with compliance with permit terms and enforcement.

NPS also would revise the permit area boundaries to minimize impacts on Seashore resources. NPS would exclude the harbor seal protection areas and a known archeological site from the new permit boundary. Removal of the seal protection areas from the permit boundary reduces the offshore boundary by approximately 4 acres. Removal of the onshore archeological site from the permit area reduces the permit area by approximately 0.3 acres. The harbor seal protection protocol within the SUP states: "throughout the year, all of Permittee's boats, personnel, and any structures and materials owned or used by Permittee shall be prohibited from the harbor seal protection areas" (NPS 2008b). Adjusting the permit area to exclude the harbor seal protection areas is not only consistent with the protocol of the current SUP but also with the 2007 CCC Cease and Desist Consent Order compliance agreed to by DBOC (DBOC 2008a[xxvii]). Additionally, DBOC proposed to reduce the area of Bed 17 to prevent impacts on harbor seals, as outlined in its proposed boundary adjustment letter to NPS on March 15, 2011 (DBOC 2011e[xxviii]). Establishing a permit boundary that is consistent with the harbor seal protection area would be consistent with the recommendations of the NAS, which documented the potential for commercial shellfish operation activities to impact harbor seals (NAS 2009). Overall, the size of Bed 17 would be reduced, as proposed by DBOC, where it overlaps the existing harbor seal protection area (see figure 2-1). These changes would take place under all action alternatives, and additional detail is provided under each alternative as applicable.

DBOC OPERATIONS AND FACILITIES

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. Under all action alternatives, DBOC operations would be subject to all applicable laws and policies. Actions such as replacement of the main dock and work platform may require

permits from agencies other than NPS. DBOC would be responsible for obtaining and complying with all appropriate permits and authorizations. Permits required may include but are not limited to the following:

- Coastal Development Permit from CCC
- State Water Resources Control Board Certification for discharge of water into Drakes Estero
- USACE section 404(b) and/or section 10 permit for dredging
- Marin County building permits

Offshore Operations and Facilities

Under all action alternatives, DBOC would cultivate approximately 138 acres of Drakes Estero using a combination of hanging and bottom culture (4 acres of Bed 17 would be removed, as discussed above). 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, as mentioned above, 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. Racks would be maintained in a "safe and orderly manner," and "all lumber utilized at the site would be processed in compliance with current laws and regulations regarding wood treatments," including lumber used in repair of racks in Drakes Estero (section 6 of the SUP). 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. As a result, it is estimated that DBOC would repair or replace up to 1,285 feet of rack and 8,900 feet of new lumber per year. If DBOC were to pursue repair of all structures listed as in poor condition, that level of installation would be higher, with up to 13,600 feet of racks repaired or replaced and more than 64,000 feet of new lumber.

DBOC would operate the motorized boats with the barges as described under the existing conditions; however, some change in travel routes would take place to maintain boats within the permitted area. DBOC would develop a vessel transit plan for implementation pending NPS review, which may include mooring areas and access lanes.

CDPH requires maintenance of two paralytic shellfish poison (PSP) monitoring stations within Drakes Estero, as well as a number of water quality monitoring stations. The inner bay PSP site is adjacent to water quality monitoring station 13 (within Bed 12) and the southern PSP station is within the current lease area on the main channel. The proposed boundary adjustment would move the boundary away from the main channel. NPS and CDPH would work to identify an appropriate site or sample timing (high tide) for 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 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 2-1). Other restrictions contained in the existing protocol, including closure of the lateral channel (also shown

on figure 2-1) during the harbor seal pupping season (March 1–June 30) and maintenance of a 100-yard buffer from any hauled-out harbor seal, would continue to be in effect.

A one-time dredging event at the main dock is common to all alternatives. The area 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. DBOC estimates that the total volume of dredged material would be 100 cubic yards (DBOC 2011d[xxix]); although straightforward calculations indicate that it would be 200 cubic yards (5,400 cubic feet).

DBOC would be required to remove all 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 would also need to be removed.

Onshore Operations and Facilities

Under all action alternatives, 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. Under all action alternatives, DBOC would replace the existing dock, work platform, and associated structures subject to NPS final review and approval due to damage from the March 2011 storm event. 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 (including sediment basin approximately 55 feet by 24 feet)
- New wooden ramps to connect the dock and work platform
- A new conveyor
- A washing system

These items would be constructed in approximately the same location as the existing structures; however, DBOC proposes some changes in size and materials. An advanced washing system with a collector for sediment is proposed. DBOC proposes to install a concrete work platform with a retention curb and sediment basin to limit debris returning to Drakes Estero during shellfish washing and processing at the work platform (DBOC 2011a[xxx], 2011b[xxxi]). These structures would be considered personal property and subject to removal from the site by DBOC prior to expiration of the SUP.

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

Under alternative B, 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. Because this alternative includes the authorization for DBOC to continue operating, NPS would delay the conversion of congressionally designated potential wilderness to congressionally designated wilderness until 2022.

This alternative would allow DBOC to conduct its operations in a manner generally consistent with conditions that existed in 2010. Most processing operations would occur according to current practices and within existing structures. In order to receive the new permit, however, DBOC would be required to bring all existing operations and facilities into compliance with the terms of the SUP. In particular, DBOC would be required to provide a detailed operation and maintenance plan for currently unpermitted activities and remove any DBOC property outside the permit area, such as shell piles and abandoned setting tanks. NPS would monitor DBOC activities to ensure compliance with permit terms. Future requests by DBOC for changes to facilities or operations would be reviewed by NPS for consistency with the intent of this alternative, which is to maintain the existing (2010) level of operations and development.

The following addresses further actions and elements of alternative B relating to SUP areas, commercial shellfish species, and DBOC operations and facilities. Refer to the sections “Elements Common to All Alternatives” and “Elements Common to All Action Alternatives” for additional detail.

SPECIAL USE PERMIT AREA AND MARICULTURE SPECIES

Under alternative B, the total acreage of the SUP area, both onshore and offshore, would be approximately 1,083 acres. The permit boundaries would incorporate all areas necessary for boat operations and cultivation, while excluding areas containing sensitive park resources (figures 2-7 and 2-8). The permitted area would incorporate most documented shellfish growing areas within Drakes Estero currently under production. Specifically, the southeast boundary of alternative B would follow the harbor seal protection area boundary. In addition, approximately 74 acres would be added in Schooner Bay to connect the existing parcels for boat travel and incorporate six racks that are not within the existing SUP area. The proposed reductions in growing area beds are consistent with recommendations of the NAS as well as previous DBOC communications in 2008, 2010, and 2011 regarding lease boundary adjustments (described in more detail under the section “Elements Common to All Action Alternatives”).

Mariculture Species

Under alternative B, shellfish species cultivated within Area 1would consist of Pacific oysters, European flat oysters, and Manila clams (previously unpermitted in Area 1). Shellfish species cultivated within Area 2 could consist of purple-hinged rock scallops (as currently permitted). The production level limits would be consistent with the existing production levels.

Project Area

Congressionally Designated Wilderness
(NPS GIS Data for Philip Burton Wilderness Area 2011)

Congressionally Designated Potential Wilderness
(NPS GIS Data for Philip Burton Wilderness Area 2011)

Harbor Seal Protection Areas
(NPS SUP 2008)

Onshore Permit Area

Offshore Permit Area 1

Offshore Permit Area 2

Oyster Racks
(DBOC letter to NPS, attachment 12b, November 15, 2010)

Culture Beds with Numbers
(DBOC letter to NPS, attachment 12a, November 15, 2010)

DBOC Boat Travel Route
(DBOC letter to NPS, attachment 1a, November 15, 2010)

SIR FRANCIS DRAKE BOULEVARD

Access Road

SIR FRANCIS DRAKE BOULEVARD

Schooner Bay

Creamery Bay

Home Bay

Barries Bay

Estero Trail

DRAKES ESTERO

35 34 33 4 31 8 9 5 6 37 38 39 41 40 7 26 27 22 30 29 11 13 12 24 23 21 20 14 15 16 42 17

During harbor seal pupping season Drakes Estero is closed to recreational boats March 1 to June 30 annually. DBOC boat operations continue year-round, but with limitations during the pupping season.

MARICULTURE SPECIES

Area 1:
Pacific Oyster
European Flat Oyster
Manila Clam

Area 2:
Purple-hinged Rock Scallop

North

0 1,500 Feet

Source: ESRI Data & Maps (CD-ROM v. 9.3-2008) and USDA/NRCS Orthophotography (2008)

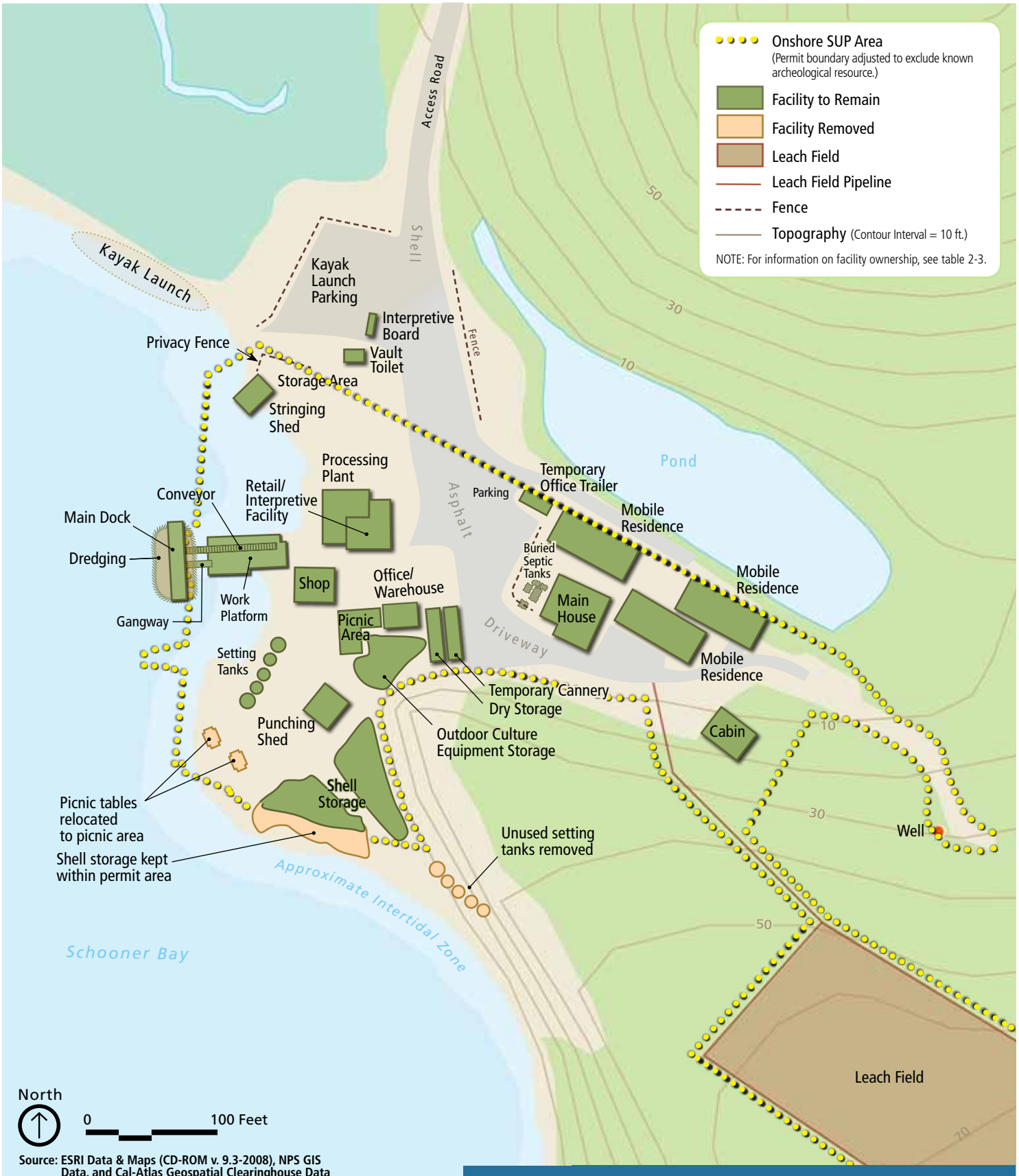
Drakes Bay Oyster Company Special Use Permit
Environmental Impact Statement

National Park Service
U.S. Department of the Interior

Point Reyes National Seashore

FIGURE 2-7

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)



Source: ESRI Data & Maps (CD-ROM v. 9.3-2008), NPS GIS Data, and Cal-Atlas Geospatial Clearinghouse Data

Drakes Bay Oyster Company Special Use Permit
Environmental Impact Statement

National Park Service
U.S. Department of the Interior

Point Reyes National Seashore

FIGURE 2-8

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)

In their 2010 proof of use report to CDFG, DBOC reported harvesting a total of 585,277 pounds of oysters and 684 pounds of clams (CDFG 2010a). The NPS SUP would set the production limit for total shellfish produced (all species harvested) annually at 600,000 pounds. This level of production is consistent with the 2010 DBOC harvest.

DBOC OPERATIONS AND FACILITIES

Offshore Operations and Facilities

Under alternative B, the boundaries of offshore permit Area 1 would be similar to the current SUP offshore boundary (see figure 2-7). Because of the need for DBOC boats to travel between the existing offshore parcels in Schooner Bay, the new SUP would eliminate the gap between these parcels, thereby resolving the concern that DBOC boats currently travel outside the permit area boundary. As with the current SUP, the new SUP would prohibit DBOC from conducting any activities within harbor seal protection areas. These areas would be excluded from the permit area. Area 1 of the offshore permit area would total approximately 1,077 acres. The 1-acre Area 2 (known under existing conditions as Lease M-438-02) would remain as a separate cultivation area for purple-hinged rock scallops.

Onshore Operations and Facilities

Under alternative B, the new SUP would incorporate a total of approximately 4.3 acres of onshore areas. The new permit boundary and list of structures associated with the SUP are shown on figure 2-8. DBOC would be required to move shell storage and picnic benches so they are within the permit boundary. Although some items were placed without NPS approval (i.e., the cannery, dry storage, outdoor setting tanks, and picnic area), alternative B includes these structures in their present location. This would be consistent with the intent of this alternative, which is to maintain existing (2010) conditions.

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

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. Because this alternative would authorize DBOC to operate for 10 years, NPS would delay the conversion of congressionally designated potential wilderness to congressionally designated wilderness until 2022.

The intent of this alternative is to allow DBOC to conduct those aspects of its operation that were approved by NPS when the existing SUP was issued in April 2008. As a result, DBOC would not be allowed to harvest Manila clams from permit Area 1 but could continue to harvest Pacific oysters and European flat oyster from this area. Clams would be limited to the 1-acre Area 2 plot, where purple-hinged rock scallops

could also be cultivated. Additionally, DBOC would be required to remove any DBOC property outside the permit area, including shell piles and abandoned setting tanks. DBOC would also have to remove picnic tables from the permit area and remove all Manila clams from Area 1 on or before the expiration date of the existing permit. Future requests by DBOC for changes to facilities or operations would be reviewed by NPS for consistency with the intent of this alternative, which is to limit the scale of DBOC operations to those activities approved by NPS as of April 2008. Given the intent of this alternative, it is unlikely that additional or expanded facilities would be approved under this alternative.

The following addresses further actions and elements of alternative C relating to SUP areas, commercial shellfish species, and DBOC operations and facilities. Refer to the sections "Elements Common to All Alternatives" and "Elements Common to All Action Alternatives" for additional detail.

SPECIAL USE PERMIT AREA AND MARICULTURE SPECIES

Under alternative C, permit boundaries would incorporate areas necessary for boat operations and cultivation, while excluding all other areas (such as those containing sensitive park resources) from access (figures 2-9 and 2-10). The total acreage of the SUP area, including both offshore and onshore areas, would be approximately 901 acres. Approximately 74 acres would be added to the main offshore permit area (Area 1) in Schooner Bay to connect the existing parcels for boat travel and incorporate six racks identified outside of the current SUP. The permitted area would incorporate most documented shellfish growing areas within Drakes Estero currently under production. Specifically, 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 the established harbor seal haul-out areas. The proposed reductions in growing area beds are consistent with recommendations of the NAS, as well as previous DBOC communications in 2008, 2010, and 2011 regarding lease boundary adjustments (described in more detail under the section "Elements Common to All Action Alternatives").

From a water quality standpoint, the majority of Drakes Estero is considered conditionally approved, meaning that it must be monitored to ensure that water quality standards are met. The inner reaches of Creamery Bay, Barries Bay, and Home Bay, however, are unclassified and characterized as prohibited. The 2011 *Management Plan for Commercial Shellfishing in Drakes Estero, California* (CDPH 2011) presents a map depicting the prohibited areas. Baltan 2006 states that these areas were previously removed from conditional classification because of elevated fecal coliform. CDPH conducts limited monitoring at the secondary stations, but the water quality conditions do not meet the requirements for approval. There are no growing areas within the water quality prohibited area. These areas (approximately 162 acres) would not be included in the offshore permit Area 1.

Mariculture Species

Under alternative C, Pacific oysters and European flat oysters would be allowed for culture, production, and harvest in Area 1, as currently permitted by NPS. Similarly, cultivation of purple-hinged rock scallops would be authorized in Area 2. Although Manila clams are presently cultivated in and harvested from Area 1, a SUP granted under this alternative would only allow cultivation and harvest of Manila clams in Area 2. Under 2008 conditions, clams were not permitted by NPS outside Area 2. Should this alternative be selected, DBOC would be required to remove all Manila clams currently being cultivated in Area 1 prior to receipt of a new SUP.

Under alternative C, the NPS would set the annual production limit for total shellfish produced in Drakes Estero at 500,000 pounds to represent 2008 conditions. This is based on the average production between the years of 2007 and 2009 (see table 2-1). The average production level over this three year period was 454,188 pounds of shellfish, according to tax records submitted by DBOC to CDFG. Alternative C adds approximately 10 percent to this average to acknowledge variability in annual production and would therefore set the annual production limit at 500,000 pounds. Section 4(b)(i) of the 2008 SUP states that "production of all shellfish species shall be capped at the 'current production level' as determined under the California Coastal Commission Consent Order No. CCC-07-CD-04." Section 3.2.10 of CCC Consent Order No. CCC-07-CD-04, states that production of all shellfish species shall be capped at the "current production level." To establish this "current production level," CCC required that DBOC provide documentation, "including the amount harvested in the last year and any projected increases in yield for the coming year" (CCC 2007b). This level of production also would be similar to the levels on which the NAS report on commercial shellfish operations within Drakes Estero based potential impacts. This report was based on 2008 and 2009 levels (see table 2-1 for each year's documented production levels).

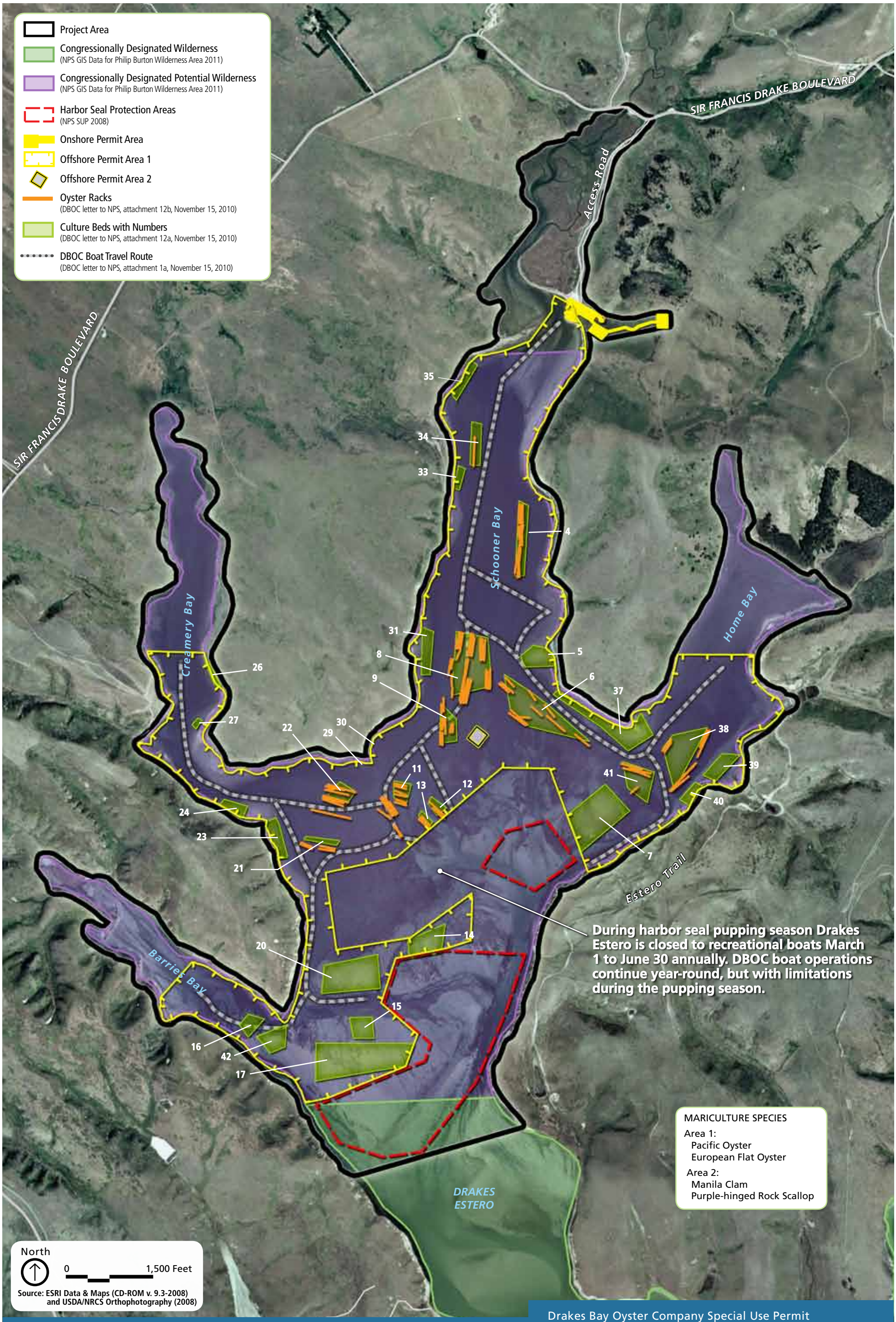
DBOC OPERATIONS AND FACILITIES

Offshore Operations and Facilities

Under alternative C, two modifications would be made to the boundary of offshore permit Area 1 (figure 2-9). Because of the need for DBOC's boats to travel between the two existing offshore parcels in Schooner Bay, the new SUP would eliminate the gap between the two parcels, thereby resolving the concern that DBOC boats currently travel outside the permit area boundary. Alternative C would additionally remove those areas designated as closed to shellfish harvest ("Prohibited") by CPDH from the permit area. With these adjustments, the offshore permit Area 1 would total approximately 896 acres. The 1-acre Area 2 parcel (formerly Lease M-438-02) would remain as a separate cultivation area for Manila clam and scallop cultivation. Like the existing SUP, DBOC would be prohibited from conducting any activities within harbor seal protection areas, and these areas would be excluded from the permit area.

Onshore Operations and Facilities

Under alternative C, the new SUP would encompass an onshore area of approximately 4.3 acres. This would include the well and septic areas and the basic structures required for the commercial shellfish operation. The SUP boundary and list of structures permitted under alternative C are shown on figure 2-10. The cannery, dry storage, outdoor setting tanks, and picnic area were installed without NPS approval. Under this alternative, the NPS would allow DBOC to retain the cannery, dry storage, and outdoor setting tanks, which are deemed essential to maintenance of a viable operation. Consistent with the current SUP, the NPS would install picnic tables near the parking lot. Visitors to the commercial shellfish operation would be allowed to use these picnic tables. DBOC would remove the shell refuse piles that currently are positioned partially outside the permit area and shift the shell storage staging area entirely within the permit boundary. Relocation of the setting tanks may also be required because of their proximity to the shoreline and original placement without approval. These alterations would be consistent with the intent of this alternative, to restore the 2008 approved SUP conditions.



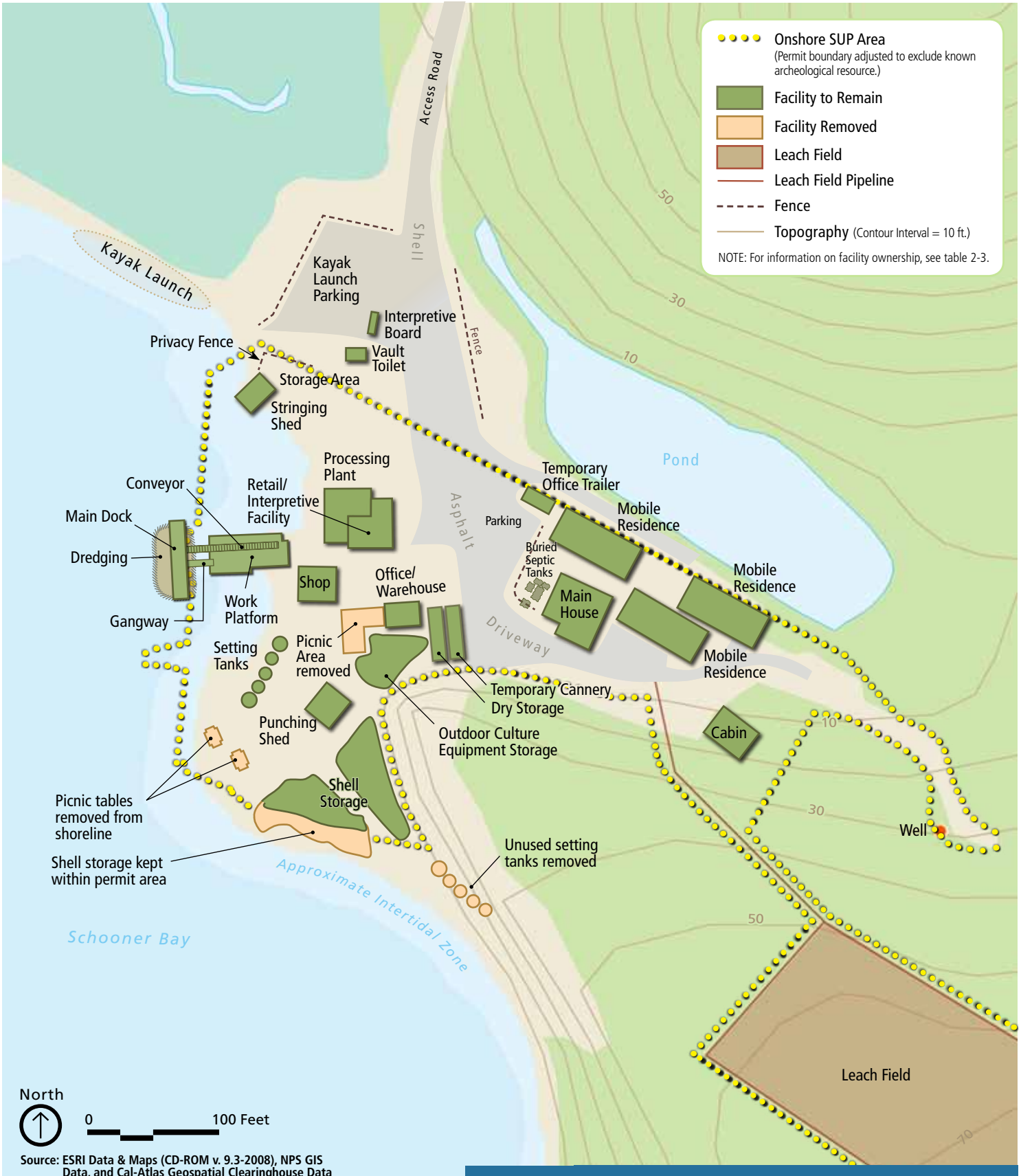
Drakes Bay Oyster Company Special Use Permit
Environmental Impact Statement

National Park Service
U.S. Department of the Interior

Point Reyes National Seashore

FIGURE 2-9

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)



Source: ESRI Data & Maps (CD-ROM v. 9.3-2008), NPS GIS Data, and Cal-Atlas Geospatial Clearinghouse Data

Drakes Bay Oyster Company Special Use Permit
Environmental Impact Statement

National Park Service
U.S. Department of the Interior

Point Reyes National Seashore

FIGURE 2-10

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)

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

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. Because this alternative would authorize DBOC to operate for 10 years, NPS would delay the conversion of congressionally designated potential wilderness to congressionally designated wilderness until 2022.

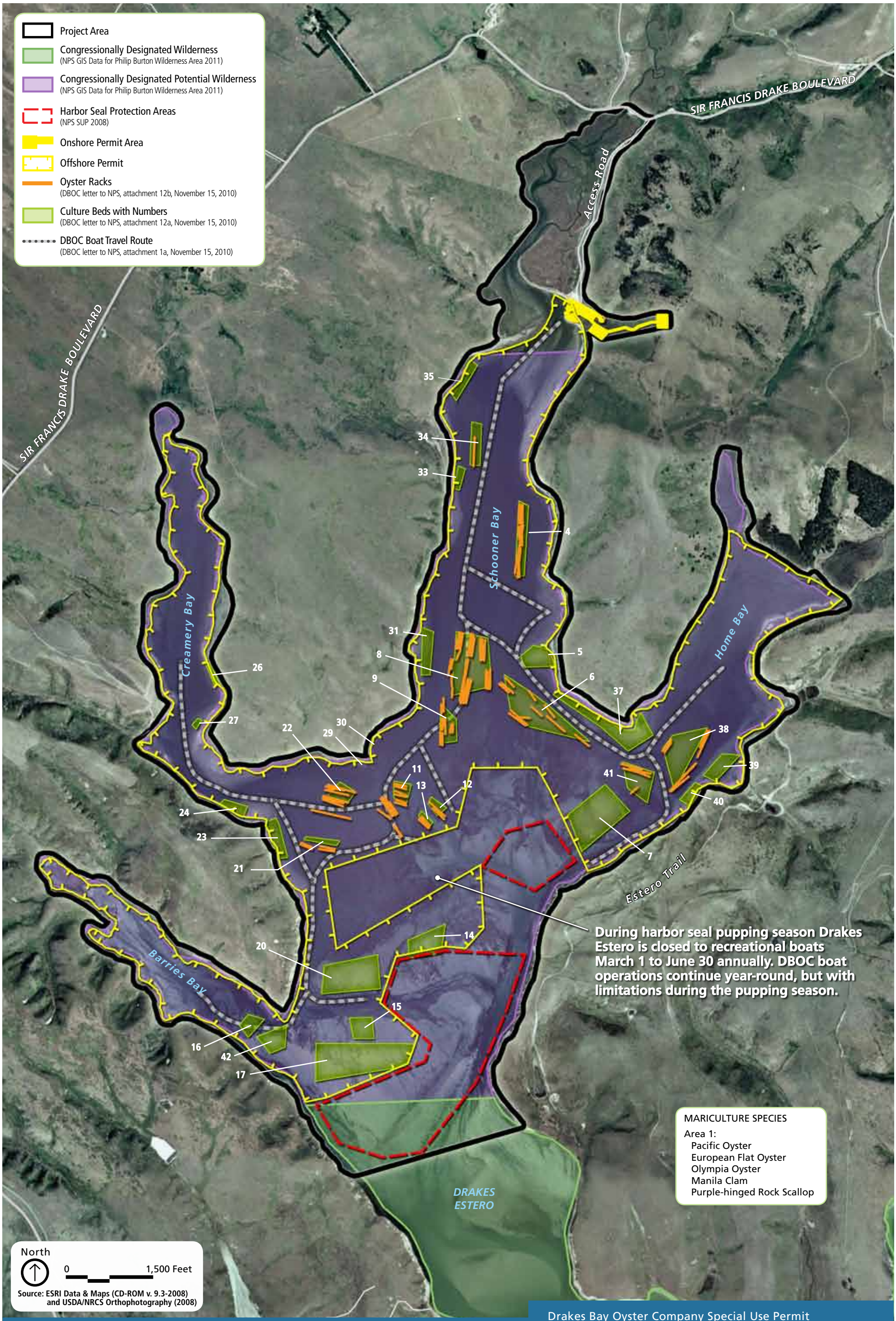
Alternative D presents an expanded oyster operation scenario that is representative of DBOC's desired condition. The elements of this alternative are based largely on information submitted by DBOC prior to and during the development of this EIS. Under this alternative, DBOC would expand its operations and add to or modify facilities and infrastructure. Two conceptual drawings have been presented to NPS, one developed in 1998 by JOC and the other a more recent proposal prepared specifically for DBOC.

This EIS analyzes these proposals at the conceptual level. Additional design and evaluation of onshore development options would be required before any construction could be authorized. Additional NEPA compliance would be required. Future requests beyond the proposals presented here would be evaluated for consistency with the intent of this alternative, which is expanded development and operations until expiration of the new SUP. It is likely that additional or expanded facilities would be approved under this alternative. DBOC would be responsible for gaining all applicable permits and approvals prior to construction. Any new facilities and infrastructure constructed by DBOC would be considered DBOC's private property, which DBOC would be required to remove by November 30, 2022.

The following addresses further actions and elements of alternative D relating to SUP areas, commercial shellfish species, and DBOC operations and facilities. Refer to the sections "Elements Common to All Alternatives" and "Elements Common to All Action Alternatives" for additional detail.

SPECIAL USE PERMIT AREA AND MARICULTURE SPECIES

Under alternative D, permit boundaries would incorporate areas necessary for boat operations and cultivation, while excluding areas containing sensitive park resources, such as archeological sites and harbor seal haul-out areas, from access (figures 2-11, 2-12, and 2-13). 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. The boundaries for offshore Area 1 of the permit would be generally based on the DBOC proposal to CDFG for lease boundary revisions (DBOC 2011e[xxxii]). Approximately 74 acres would be added to the permit area (Area 1) in Schooner Bay to connect the existing parcels for boat travel and incorporate six racks identified outside of the current SUP. The permitted area would incorporate most documented shellfish growing areas within Drakes Estero currently under production. The southeast boundary of alternative D would follow the harbor seal protection area protocol and the proposed DBOC shellfish growing area boundary. The proposed reductions in growing area beds are consistent with recommendations of the NAS, as well as previous DBOC communications in 2008, 2010, and 2011 regarding lease boundary adjustments (described in more detail under the section "Elements Common to All Action Alternatives").



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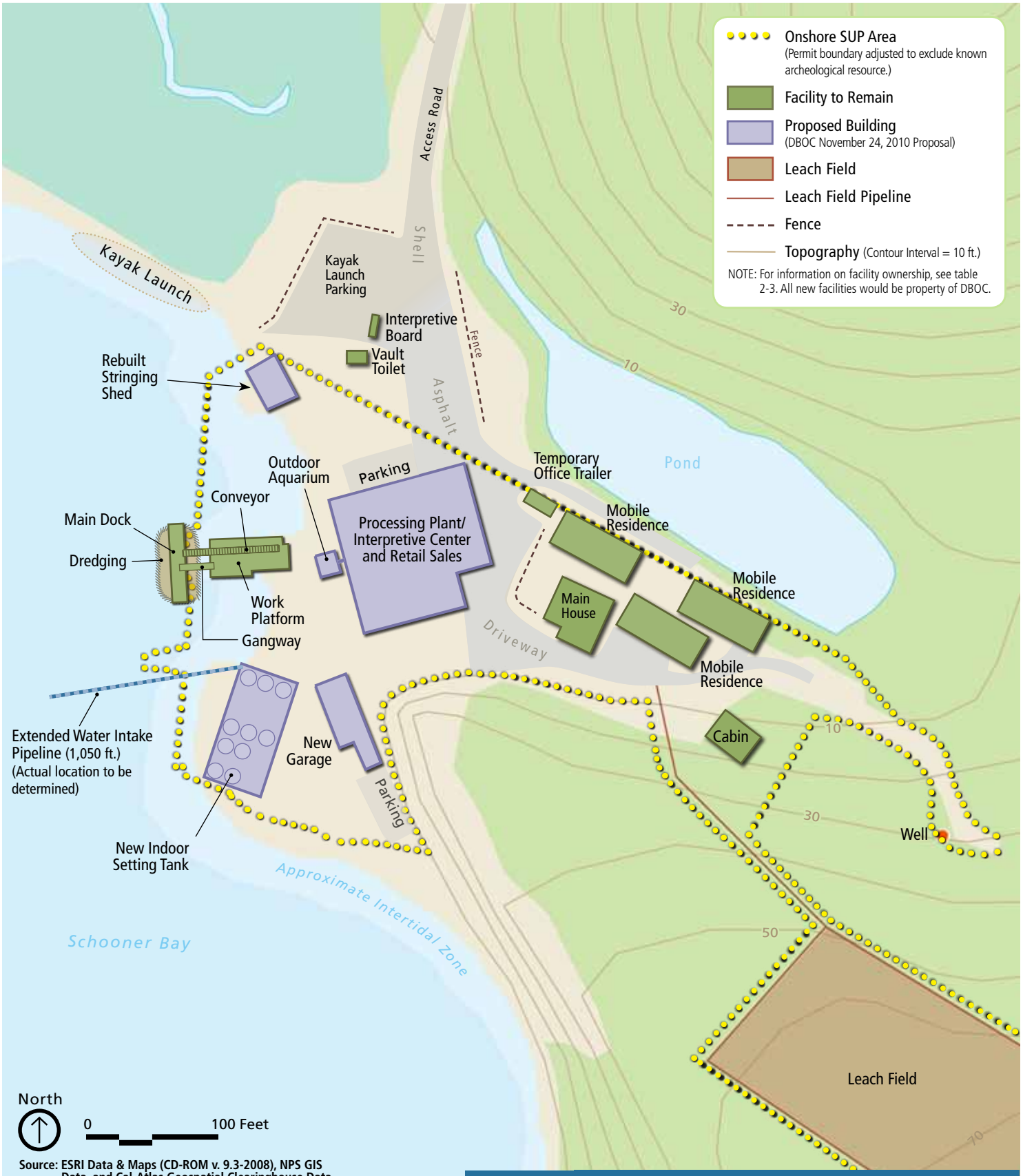
Point Reyes National Seashore

Drakes Bay Oyster Company Special Use Permit
Environmental Impact Statement

FIGURE 2-11

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



Source: ESRI Data & Maps (CD-ROM v. 9.3-2008), NPS GIS Data, and Cal-Atlas Geospatial Clearinghouse Data

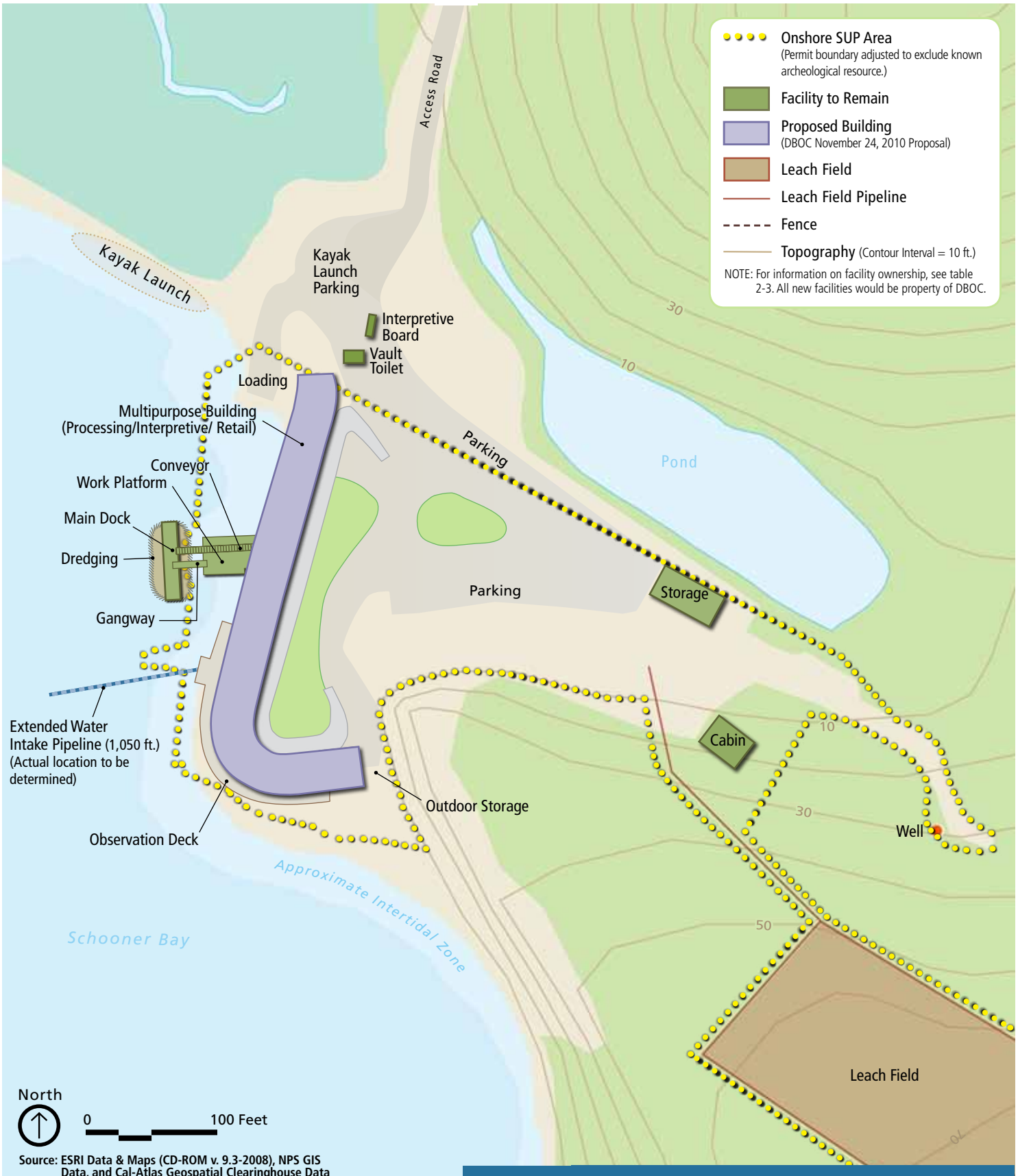
Drakes Bay Oyster Company Special Use Permit
Environmental Impact Statement

National Park Service
U.S. Department of the Interior

Point Reyes National Seashore

FIGURE 2-12

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)



Source: ESRI Data & Maps (CD-ROM v. 9.3-2008), NPS GIS Data, and Cal-Atlas Geospatial Clearinghouse Data

Drakes Bay Oyster Company Special Use Permit
Environmental Impact Statement

National Park Service
U.S. Department of the Interior

Point Reyes National Seashore

FIGURE 2-13

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)

Mariculture Species

Under alternative D, culture, production, and harvest of Pacific oysters, European flat oysters, Olympia oysters, purple-hinged rock scallops, and Manila clams would be permitted in Area 1, as requested by DBOC (DBOC 2010g[xxxiii], 2011c[xxxiv]). DBOC currently cultivates Pacific oysters and Manila clams in Area 1, although the latter are being grown without NPS approval. This alternative would result in after-the-fact approval of Manila clam cultivation in Area 1. Because all four species would be grown in Area 1, there would be no need to maintain Area 2 as a separate area under this alternative.

DBOC has also indicated that there would be no changes in production methods associated with this alternative (DBOC 2010g[xxxv]). However, DBOC separately stated that it has been studying purple-hinged rock scallops and recognizes the challenges in producing scallop seed and rearing scallops. Hatchery techniques are less established for scallops than for oysters. Scallops take approximately 4 years to reach market size (approximately 1 pound). DBOC indicated that this is a long-term project that would require significant research, training, and investment (DBOC 2011c[xxxvi]).

DBOC also has requested permission to collect native Olympia oyster and purple-hinged rock scallop larvae within Drakes Estero for private commercial purposes. The intent is to collect free-swimming larvae to cultivate the same genetic types as are normally found in Drakes Estero and to reduce reliance on outside sources. No detailed information was provided on the proposed collection techniques. Though such collection is considered and analyzed as part of this alternative, it may not ultimately be authorized. NPS regulations (36 CFR 2.1 and 2.3) and NPS *Management Policies 2006* prohibit this sort of collection.

Under alternative D, production levels would be consistent with the production levels requested by DBOC to CCC in 2008. During the initial efforts to address the 2007 CCC Cease and Desist Consent Order regarding production limits, DBOC suggested a production limit of 850,000 pounds. This limit was based on the 2006 and 2007 planting records. According to DBOC, “if all environmental conditions are conducive and mortality rates are low, as much as 850,000 pounds could be harvested in a single year” (DBOC 2008b[xxxvii]). Under alternative D, shellfish production would not exceed 850,000 pounds annually (inclusive of all harvested species). This level of production would be approximately 40 percent greater than the 2010 annual DBOC production and is approximately 85 percent greater than the level of production that occurred between 2007 and 2009.

DBOC OPERATIONS AND FACILITIES

Offshore Operations and Facilities

Under alternative D, the offshore permit boundaries would be based on DBOC’s proposed adjustments to Lease M-438-01 (DBOC 2011e[xxxviii]), but with some adjustments (see figure 2-11). Because of the need for DBOC’s boats to travel between the two offshore parcels in Schooner Bay, the new SUP would eliminate the gap between the two parcels, thereby resolving the concern that DBOC boats currently travel outside the permit area boundary. This change would add 74 acres to the existing permit area. As with the current SUP, the new SUP would prohibit DBOC from conducting any activities within harbor seal protection areas. These areas would be excluded from the permit area. This would result in the offshore permit area totaling approximately 1,082 acres. Because of the increased production limit, there is the

potential for DBOC to increase the acreage of commercial shellfish culture taking place in Drakes Estero at one time (fewer culture beds may lie fallow) and for more frequent boat trips to take place; however, commercial shellfish activities would remain limited to the 138 acres designated on figure 2-11.

Onshore Operations and Facilities

Because the permit applicant has suggested two conceptual designs that are developed to differing degrees, this alternative presents each option at a conceptual level. If this alternative is ultimately selected, a full design process would be initiated to develop a reasonable range of new development options for the site. As described under "Elements Common to All Action Alternatives" any new construction would be considered personal property and subject to demolition and removal prior to the expiration of the SUP. Proposals would be subject to revision to address functionality, safety, economic feasibility (given that the new permit is limited to a 10-year term), and impacts on park resources and visitor experience. Because both options involve construction of new buildings, the plans would be subject to additional environmental review, including an evaluation of flood zones and alternate locations to avoid fill of wetlands.

During the development of this EIS, DBOC submitted two concepts for expanded onshore development of the site. Option 1 is summarized on figure 2-12 and is based on a 1998 development proposal by JOC submitted by DBOC during public scoping (DBOC 2010n[xxxix]). Additional detail was supplied by DBOC's most recent application to CCC for a coastal development permit (DBOC 2010f[xl]). Under this option, the temporary office trailer, the three mobile homes, the main house, the cabin, and the dock would remain in their existing configuration (see table 2-3 for detail on size and ownership). The stringing shed would be rebuilt. A new indoor setting tank (approximately 6,400 square feet) would be built in the approximate location of the existing outdoor setting tanks.

A new 1,050-foot water intake pipe would be installed into Drakes Estero to supply water for the oyster processing activities. The existing processing plant would be demolished to make way for a new two-story processing and interpretive center (approximately 7,600 square feet). An outdoor aquarium would be attached to this structure. A new garage and employee parking area also would be constructed south of the new processing and interpretive center. The two shipping containers serving as the cannery and dry storage would be removed.

The NPS conducted a EA for this development and approved the development under a FONSI in 1998 (NPS 1998a, 1998b). Only the new septic facilities identified in the project were constructed. In the 13 years since this approval, NPS management policies and NPS NEPA procedures have been revised. Therefore, the NPS has included this concept in Alternative D to provide a review within the context of updated policy and standards.

Perspective (looking south) of the concept evaluated in 1998 and proposed, in part, by DBOC. (Image courtesy of Dresler, as submitted by JOC.)

Option 2 is summarized on figure 2-13 and is based on a subsequent DBOC proposal to NPS (DBOC 2011g[xli]). Under Option 2, almost all existing facilities would be removed. Only three structures would remain in their existing configuration. The dock would be replaced as described under "Elements Common to All Action Alternatives." The cabin would be retained as the DBOC manager's residence, and one mobile home would be retained as storage. All other structures would be demolished to make room for a new multipurpose building (approximately 2,625 square feet). This building would serve both processing and interpretive purposes. Initial plans have included an oyster bar; however, section 18 of the RUO specifies that a restaurant would not be allowed on site without prior written approval of the Director of NPS. A new 1,050-foot water intake pipe would be installed into Drakes Estero to supply water for the oyster processing activities. As noted by DBOC, the concept drawings do not show any staff housing except a manager's residence (the cabin). DBOC may incorporate additional staff housing during further design (DBOC 2011g[xlii]). The conceptual analysis provided in this document applies only to on-site development. Should housing be provided off site, a separate review would be required (environmental compliance may not be tiered from this EIS).

Under both scenarios for expanded development, DBOC would provide expanded facilities for interpretation, cultivation, and processing. Parking also would be improved, although details of this improvement would be refined during the future design stages of development. Visitors would be provided with increased opportunities to experience the stages of shellfish processing in the improved new interpretive facility and retail shop. While the interpretive facilities may increase in size and opportunity to view the commercial shellfish operation, NPS does not expect DBOC to expand the scope of the interpretive services. Expanded services may require an additional SUP. Increased use at the site

may increase demands on water and septic utilities. Upgrades to the septic system may be required to provide sufficient capacity. Finally, both conceptual design options include the removal of the shipping containers currently in use as the cannery and dry storage.

Artist's rendering of the Option 2 facility, looking into Schooner Bay (submitted by DBOC with Option 2 site plan). (Image courtesy of Ecological Design Collaborative, as submitted by DBOC.)

ALTERNATIVE ELEMENTS CONSIDERED BUT DISMISSED

The CEQ has defined reasonable alternatives as those that meet the project objectives to a large degree, are economically and technically feasible, and meet the purpose of and need for the proposed action. Alternatives that cannot be implemented or that do not resolve the need for action nor fulfill the stated purpose (to a large degree) should be eliminated from further analysis. The Director's Order 12 Handbook further states that options that are unreasonably expensive, that do not meet park mandates, that are inconsistent with park statements of purpose and significance or management objectives, or that have severe environmental consequences may also be unreasonable alternatives to consider, although none of these factors automatically render them so (NPS 2001b). The following alternative elements were considered but dismissed from in-depth analysis.

OPEN SHELLFISH OPERATIONS TO COMPETITIVE BID

During the scoping phase of the project, the NPS received public comments suggesting that commercial shellfish operations within Drakes Estero be opened to competitive bid as is generally done for concession operations. Congress has authorized the NPS to issue, subject to certain considerations and then only pursuant to certain conditions, a SUP for the operations of DBOC within Drakes Estero at the Seashore (PL 111-88 section 124, 123 Stat. 2904 [2009]). As that statutory authorization is limited to only one specific entity, DBOC, the SUP cannot be made subject to competition.

Also, section 124 precludes NPS from requiring DBOC to seek a concession contract, another mechanism designed to foster competition. Public comments correctly note that concession contracts may not be awarded in most circumstances without a competitive selection process. Concession contracts may only be awarded for certain types of commercial operations, which do not include commercial shellfish operations at Drakes Estero. Concession contracts are limited to visitor services; i.e., to public accommodations, facilities, and services that are necessary and appropriate for public use and enjoyment of the unit of the national park system in which they are located (16 U.S.C. 5951[b] to 5952; 36 CFR 51.3 [definition of "visitor service"]).

The primary focus of DBOC is the commercial operation for sale of shellfish to restaurants and the wholesale shellfish market outside the Seashore. These are not commercial services being offered to the visiting public to further the public's use and enjoyment of the Seashore. As such, these are not visitor services and consequently are not eligible for a concession contract.

This alternative element was dismissed from further analysis because (1) it is not eligible to be implemented as a concession contract and (2) the enacted legislation specifically identifies DBOC as the recipient of the SUP should one be issued.

RELOCATE DBOC

During public scoping, commenters suggested that NPS could relocate DBOC operations outside the Seashore boundaries or elsewhere within the Seashore. Mandating the relocation of DBOC is not within the authority granted to NPS by Congress in section 124. Section 124 states specifically that the Secretary is authorized to issue a SUP with the same terms and conditions as the existing authorizations (RUO and SUP) and geographically identifies these authorizations as linked to Drakes Estero. Neither section 124 nor any other statutory provision provides NPS with authority to direct a private company like DBOC to relocate its business to any particular area outside the Seashore.

Moreover, lands outside the Seashore are not subject to NPS management authority. NPS also does not have the authority to compel CFGC to issue a state water bottom lease for aquaculture on state-owned submerged lands outside the Seashore. Thus, it is not reasonable or feasible for NPS to evaluate alternatives that would require the identification of management protocols for lands and waters outside the Seashore's boundaries. The appropriate range of alternatives for this EIS consists of alternatives that relate to the Secretary's authority under section 124, which is the authority to issue a permit to DBOC at its current location in Drakes Estero.

This alternative element was dismissed from further analysis because it is beyond the scope of authority under section 124 of PL 111-88 granted to the Secretary.

ALTER SPECIAL USE PERMIT TERM

During the scoping process, it was suggested that a new SUP be issued for a period of more or less than 10 years. Section 124 states that the Secretary is authorized to issue an SUP with the same terms and conditions as the existing authorization for a period of 10 years from November 30, 2012. Prior to the enactment of section 124, NPS advised DBOC that the 1976 Point Reyes Wilderness Act and its

legislative history prohibited the NPS from issuing a permit to DBOC for operations after November 30, 2010 (see discussion in chapter 1 of this document). Section 124 is the only authority that allows NPS to issue a permit to DBOC to operate after November 30, 2012, and it clearly mandates that the permit term be 10 years. Therefore, the term of the new SUP being evaluated is for 10 years; any other length of time was considered but dismissed from in-depth analysis.

This alternative element was dismissed from further analysis because it is not consistent with section 124 of PL 111-88; thus, it does not meet the purpose of and need for action.

ISSUE A RENEWABLE SPECIAL USE PERMIT

As mentioned above, section 124 authorizes the issuance of a new SUP for a single 10-year period. Section 124 does not authorize the Secretary to issue a renewable permit. This alternative element was dismissed from further analysis because it does not meet the purpose and need for the project and is inconsistent with the authority granted to the Secretary by section 124 of PL 111-88.

CLOSE DBOC DURING A CONTROLLED STUDY

Another alternative suggested during public scoping was to cease DBOC operations for 10 years to evaluate ecosystem response prior to consideration of a new SUP. As stated in section 124, the Secretary is authorized to issue an SUP for a period of 10 years starting from November 30, 2012. Ceasing operations for 10 years to conduct studies before determining whether to issue an SUP is beyond the time frame outlined in section 124, and as such, is inconsistent with the authority granted to the NPS.

This alternative element was dismissed from further analysis because it does not meet the purpose of and need for the project and is inconsistent with the authority granted to the Secretary by section 124 of PL 111-88.

INCORPORATE PHASE OUT REQUIREMENTS IN NEW SUP

During alternatives development, the planning team considered incorporating phase out requirements into the new SUP. This option would incorporate a time frame for shellfish operations to cease at a point earlier than the full 10 years to ensure that decommissioning and removal of the facilities would be complete by November 30, 2022. Such requirements were dismissed for the following reasons: The NPS recognizes the need to consult with DBOC on the most effective way to phase out operations as the termination date of the new SUP approaches. Phase out plans may also differ among alternatives, and they may differ based on the amounts and/or locations of particular species being cultivated as the permit draws to a close. Should a new permit be issued to DBOC, the permit would allow the NPS to address phase out issues with DBOC through the annual meeting process and through NPS-retained rights under the permit to ensure DBOC compliance with all permit terms, including the requirement that DBOC remove certain buildings and facilities and all personal property, such as DBOC-owned shellfish and shellfish infrastructure, from the premises on or before November 30, 2022.

In addition, section 124 authorizes a 10-year permit under the existing terms and conditions. Adding detailed phase out requirements that would require DBOC’s operation to wind down years before the 10-

year term would not be consistent with section 124. This alternative is being dismissed because it is not feasible for NPS to outline detailed phase out requirements at this time and because the addition of detailed phase out requirements is not consistent with section 124.

COMPREHENSIVE RESTORATION OF THE DEVELOPED ONSHORE AREA

A number of commenters suggested that NPS should evaluate an alternative that would provide for a comprehensive restoration of the natural environment following the expiration of DBOC authorizations. Specific suggestions included restoration of natural hydrology through removal of the progressive fill that has been associated with commercial shellfish operations at this site for the last 77 years. This would also include restoration of wetland areas originally at this site. Other suggestions were for the removal of nonnative shell debris to enhance and allow interpretation of cultural resources. While site restoration would be consistent with applicable laws, NPS policy, and Seashore management objectives, as well as with the general intent of NPS to restore the area following the termination of nonconforming commercial uses, it is outside the stated purpose of the proposed project, which is to evaluate whether the Secretary should exercise the discretion granted under section 124 to issue a 10-year permit to DBOC. Plans for comprehensive site restoration would be developed in the future as part of a separate NEPA action. This EIS considers restoration of the developed onshore area as a reasonably foreseeable future action instead of an element of the action alternatives. The impacts of natural resource restoration at the developed onshore area are discussed in the cumulative impact sections of this EIS.

This alternative element was dismissed from further analysis because it is beyond the scope of this EIS.

CONSISTENCY WITH SECTIONS 101(B) AND 102(1) OF THE NATIONAL ENVIRONMENTAL POLICY ACT

The NPS requirements for implementing NEPA include an analysis of how each alternative meets or achieves the purposes of NEPA, as stated in sections 101(b) and 102(1). CEQ regulations (40 CFR 1500.2) state that federal agencies shall, to the fullest extent possible, interpret and administer the policies, regulations, and public laws of the United States in accordance with the policies set forth in the act (sections 101[b] and 102[1]). This section describes how each of the alternatives under consideration in this EIS meets or achieves these policies.

1. Fulfill the responsibilities of each generation as trustee of the environment for succeeding generations.

   All of the alternatives under consideration in this EIS are consistent with this policy, although to varying degrees. The Seashore was established to preserve the unique and vanishing California coastline. Within the project area, the waters of Drakes Estero are designated by Congress as potential wilderness, while the onshore areas of the commercial shellfish operation are designated as a special use zone. Alternative A would allow the NPS to fulfill its responsibilities to restore natural processes starting in 2012, upon expiration of the current permit. At that time, existing structures would be removed and uses would be limited to those that are consistent with activities permitted in wilderness. In addition, the existing congressionally designated potential wilderness in Drakes Estero would be

converted to congressionally designated wilderness in 2012. Alternatives B, C, and D would delay the restoration of the area and conversion to wilderness for 10 years. The additional 10 years of commercial shellfish operations within Drakes Estero would continue to have impacts to Seashore resources such as the risk for establishment (i.e., naturalization) and spread of nonnative species, such as *Didemnum*.

2. Assure for all Americans safe, healthful, productive, and esthetically and culturally pleasing surroundings.

   All of the alternatives under consideration in this EIS are consistent with this policy, although to varying degrees. Under all alternatives, NPS would continue to meet its obligation to ensure safe, healthful, and productive surroundings for Seashore visitors and staff. Alternative A could enhance the esthetics of the area by removing existing offshore structures and converting the area to congressionally designated wilderness in 2012. Visitors to the Seashore who wish to enjoy solitude and an unconfined, primitive form of recreation may view this alternative as more esthetically and culturally pleasing. For those visitors who wish to view an active commercial shellfish operation and enjoy the opportunity to consume fresh oysters within the Seashore, Alternative A would not be as esthetically or culturally pleasing.

   Under alternatives B, C, and D, restoration of the area to natural conditions and conversion to congressionally designated wilderness would be delayed by 10 years. During this 10 year period, the area would continue to be characterized by the presence of commercial shellfish equipment, racks, bags, and mariculture-related noises such as motorboat engines and pneumatic drills. The natural setting may also be altered due to the risks associated with invasive species and shellfish-borne diseases.

   In terms of productivity, alternatives B, C and D would allow for the continued production of shellfish for 10 years, which could be considered a productive use of Drakes Estero. These alternatives would result in contributions to California's overall shellfish production. Under alternative A, all commercial oyster production would cease, although some other productive uses of Drakes Estero, such as kayaking and recreational clamming would continue. Restoration of natural processes and conversion of the congressionally designated potential wilderness to congressionally designated wilderness in 2012 would also be considered a productive use under alternative A.

3. Attain the widest range of beneficial uses of the environment without degradation, risk of health or safety, or other undesirable and unintended consequences.

   Alternative A would provide a wilderness experience to those visitors seeking solitude and an unconfined, primitive form of recreation within the congressionally designed wilderness in Drakes Estero starting in 2012. Alternative A would provide this beneficial use of the environment without degradation, risk of health or safety, or other undesirable and unintended consequences.

   Alternatives B, C, and D would also offer beneficial uses to those visitors who wish to visit an active commercial shellfish operation at the Seashore. These alternatives would also result in the

continued production of local shellfish, which would be considered a beneficial use. Alternatives B, C, and D could, however, result in undesirable and unintended consequences, such as providing a hard substrate that allows invasive species establishment and presence of refuse in Drakes Estero.

4. Preserve important historic, cultural, and natural aspects of our national heritage and maintain, wherever possible, an environment that supports diversity and variety of individual choice.

   None of the alternatives are expected to result in impacts on cultural or historic resources. No impacts to known archeological resources are anticipated and potential impacts to as yet undiscovered subsurface archeological resources would be avoided, minimized, or mitigated. Any ground-disturbing activities within the onshore areas of the SUP would take place in coordination with the California SHPO and the Federated Indians of Graton Rancheria, and would require a site monitor.

   A study and assessment of potential historical significance (a DOE) was conducted for the structures currently used by DBOC, both in Drakes Estero and onshore. Due to the level of alteration these structures have undergone over time, the assessment concluded that none maintain historic integrity and are therefore not eligible for listing on the National Register. The SHPO has reviewed the DOE and concurs that the structures are not eligible for listing on the National Register (see appendix D). Therefore, none of the alternatives would have adverse effects on historic structures.

   All alternatives would support diversity and variety of individual choice but to varying degrees. Alternative A would allow those visitors seeking solitude and an unconfined, primitive form of recreation an opportunity to enjoy a marine wilderness. However, because all commercial shellfish operations would cease, alternative A would not provide as much diversity and individual choice for those visitors wishing to visit an active commercial shellfish operation and consume fresh oysters within the Seashore. Similarly, while alternatives B, C, and D would provide the opportunity for those choosing to view a commercial shellfish operation and enjoy fresh oysters, these alternatives would diminish the opportunity for those seeking solitude and an unconfined, primitive form of recreation.

5. Achieve a balance between population and resource use that will permit high standards of living and a wide sharing of life’s amenities.

   All alternatives considered in this EIS would be consistent with this policy but to varying degrees. The Seashore is highly valued for its natural setting, especially due to its proximity to the highly developed and densely populated San Francisco Bay Area. The enabling legislation established the Seashore “to save and preserve, for purposes of public recreation, benefit, and inspiration, a portion of the diminishing seashore of the United States that remains undeveloped” (PL 87-657). Public open spaces are an important amenity and highly valued within the local area and the Bay Area. Alternative A would improve the natural setting and open space of the Seashore by removing commercial shellfish operations within Drakes Estero and converting congressionally designated potential wilderness to congressionally designated wilderness.

Economic contributions to the local economy attributed to the more than two million visitors to the Seashore annually would likely continue under all alternatives. Alternatives B, C, and D would also provide an increased economic contribution to the local and state economy by providing jobs and food production, therefore contributing to the standard of living and sharing of amenities in the area.

6. Enhance the quality of renewable resources and approach the maximum attainable recycling of depletable resources.

   Alternative A would best enhance the quality of renewable resources and maximum attainable recycling of depletable resources. Natural resources associated with the natural conditions and processes in Drakes Estero would be further protected by the conversion of congressionally designated potential wilderness to congressionally designated wilderness. Alternative A would reduce on-site energy consumption from existing conditions, as commercial shellfish operations that use energy, such as motor boats, pneumatic drills, shellfish processing, and residential facilities, would cease. Alternatives B, C, and D would result in increased on-site energy consumption compared to alternative A due to the continuation or increase in commercial shellfish operations. Alternative D would potentially result in the highest contribution to energy use due to increased oyster production and proposed new facilities. In addition, the shellfish cultivated by DBOC under alternatives B, C, and D are not a natural resource within Drakes Estero. Seed for nonnative Pacific oysters and Manila clams are imported from outside California. The use of outside resources does not result in enhancement of renewable resources or maximum recycling of depletable resources.

PREFERRED ALTERNATIVE

DOI regulations, 43 CFR 46.425(a), state that a Draft EIS, "should identify the bureau's preferred alternative or alternatives, if one or more exists." At this time, there is not a preferred alternative. Full and objective input from the public is encouraged on all of the alternatives analyzed in the Draft EIS. All public comments received on the Draft EIS will be evaluated and considered in the development of the preferred alternative which will be identified in the Final EIS.

ENVIRONMENTALLY PREFERABLE ALTERNATIVE

The NPS is required to identify the environmentally preferable alternative in its NEPA documents for public review and comment. Guidance from CEQ states that the environmentally preferable alternative is “the alternative that causes the least damage to the biological and physical environment; it also means the alternative which best protects, preserves, and enhances historic, cultural, and natural resources” (CEQ 1981).

Alternative A is identified as the environmentally preferable alternative because it has the most potential to protect the biological, physical, and cultural environment in and around Drakes Estero. This is based on the following considerations:

- Subsequent to expiration of the SUP, the congressionally designated potential wilderness would be converted to congressionally designated wilderness, as directed by Congress and NPS policies, providing a marine wilderness experience to the public.
- Eelgrass beds in Drakes Estero would benefit from removal of shading by oyster racks and damage by motorboat propellers. These special aquatic ecosystems, functioning as habitat, nursery grounds, and food for numerous species of fish, waterfowl, and other marine species, would not be disrupted on a daily basis under alternative A.
- Control of the invasive tunicate *Didemnum* would be more manageable under alternative A. Already present within Drakes Estero, this invasive species most often attaches to hard substrates, including hanging culture and racks. Alternative A would remove more than 7 acres of artificial hard (preferred substrate) structures currently used as habitat by the *Didemnum* thereby making management more feasible. Alternatives B, C, and D would allow the oyster substrate to persist or increase for another 10 years, enabling continued expansion of this invasive species.
- Removal of cultivated nonnative species under alternative A would best protect the natural ecosystem of Drakes Estero. Alternatives B, C, and D would allow cultivation of nonnative species to take place in Drakes Estero for another 10 years, which would provide additional time during which these species may become naturalized in this ecosystem. Manila clams are now documented outside of culture bags, and their age structure indicates recent naturalization (Grosholz 2011b). Ongoing cultivation of Manila clams for a period of 10 years would likely result in expansion of this nonnative species.
- Alternative A would eliminate the daily use and operation of motorboats on Drakes Estero, thereby reducing the potential for disturbance to the resident and migratory wildlife species that depend on its resources.
- Wetland functions and values would be restored through natural processes under alternative A. Fringe wetland habitat and eelgrass beds are susceptible to impacts from continued wave action (such as that caused by boat wakes) and placement of fill material. Alternative A would eliminate from Drakes Estero the daily motorboat traffic and the oyster growing bags, allowing these natural habitats to reestablish. Placement of culture bags and the use of motorboats by DBOC would persist or increase for another 10 years under alternatives B, C, and D.
- Atmospheric and underwater noise associated with boat motors, oyster tumblers, pneumatic drills, and daily customer traffic would be removed under alternative A, thus restoring a more natural soundscape within Drakes Estero. These noise generators and associated disturbance would persist and in some cases perhaps increase for another 10 years under alternatives B, C, and D.

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): ▪ Pacific oysters ▪ European flat oyster ▪ Manila clams[a] Area 2 (1.0 acre): ▪ Purple-hinged rock scallops	Area 1 (896 acres): ▪ Pacific oysters ▪ European flat oyster Area 2 (1.0 acre): ▪ Purple-hinged rock scallops ▪ Manila clams	Area 1 (1,082 acres): ▪ Pacific oysters ▪ European flat oyster ▪ Olympia oysters ▪ Manila clams ▪ Purple-hinged rock scallops 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	▪ Japanese hanging culture ▪ French tube culture ▪ Bottom bags ▪ Floating bags ▪ Floating trays	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.

[a] 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	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. Area 2 would be maintained for cultivation of purple-hinged rock scallops. Offshore permit area would include 1,078 acres.	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. Area 2 would be maintained for cultivation of Manila clams and purple-hinged rock scallops. Offshore permit area would include 897 acres.	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. Area 2 would not be maintained as a separate growing area. Offshore permit area would include 1,082 acres.
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 the 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.[a]	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

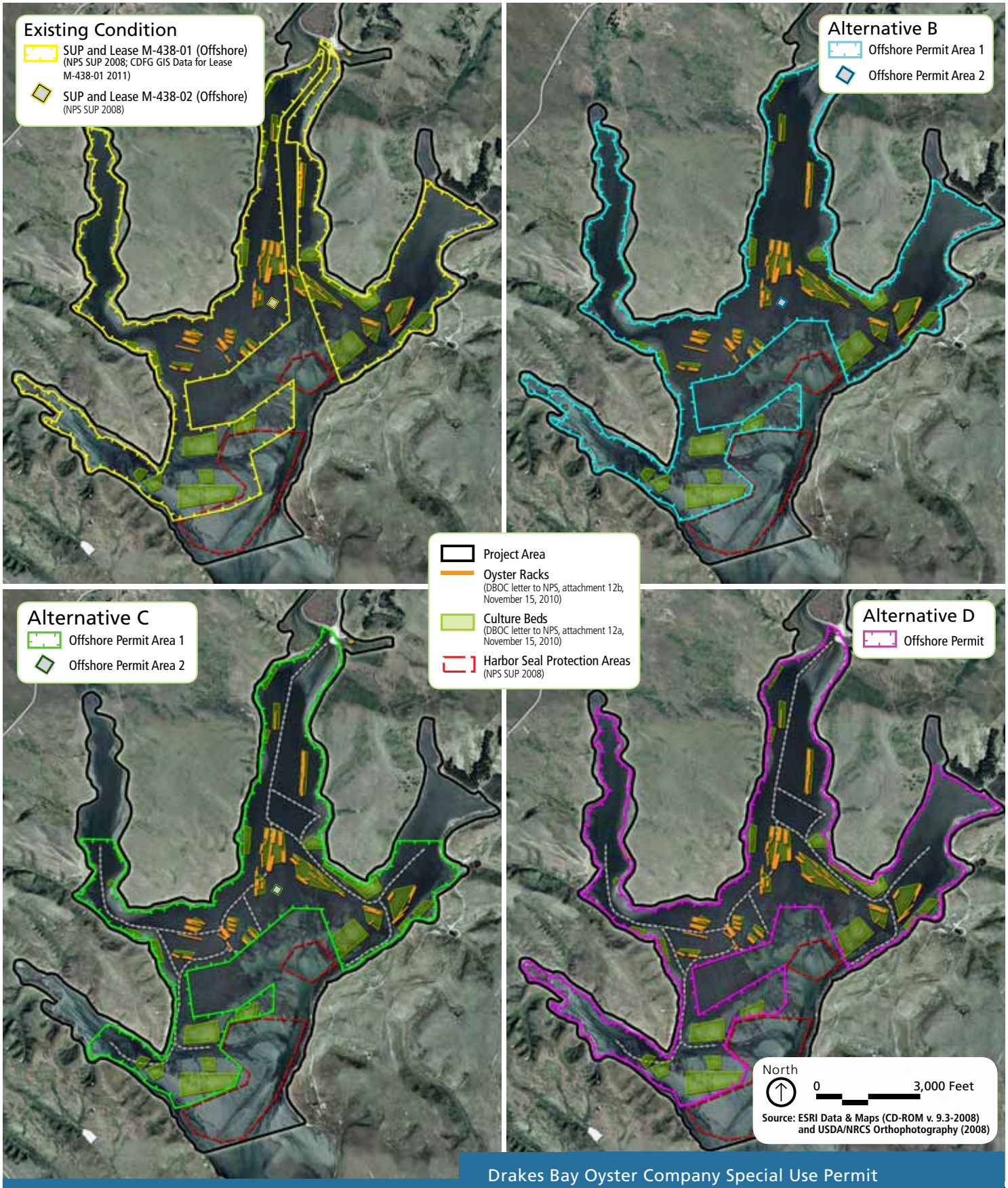
TABLE 2-5. SUMMARY OF ALTERNATIVES (CONTINUED)

	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.[a]	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[a]).	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. The 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.

[a] Items have not previously been permitted by NPS

COMPARISON OF SPECIAL USE PERMIT BOUNDARIES

Figure 2-14 shows side-by-side comparisons of the overall SUP boundaries as they currently exist and as they would exist under each action alternative. The SUP boundaries are shown at the scale of Drakes Estero because it is the offshore boundaries that change between alternatives. The onshore boundaries remain the same for each action alternative. Under alternative A, no SUP would be issued; therefore, there are no SUP boundaries to display for alternative A.



Drakes Bay Oyster Company Special Use Permit
Environmental Impact Statement

National Park Service
U.S. Department of the Interior

Point Reyes National Seashore

FIGURE 2-14

Comparison of Offshore Permit Areas

SUMMARY OF ENVIRONMENTAL CONSEQUENCES

Table 2-6 provides a summary of the environmental consequences related to each alternative. A more detailed explanation of the impacts is presented in "Chapter 4: Environmental Consequences."

TABLE 2-6. SUMMARY OF ENVIRONMENTAL CONSEQUENCES

Alternative A	Alternative B	Alternative C	Alternative D
Action/Impact	Action/Impact	Action/Impact	Action/Impact
Wetlands			
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 *Didemnum*. 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.	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. By obtaining state and federal permits, alternative B would be consistent with relevant law and policy related to management of wetlands. DBOC's	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. By obtaining relevant state and federal permits, alternative C would be consistent with relevant law and policy related to management of	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 would be long-term moderate adverse, and

TABLE 2-6. SUMMARY OF ENVIRONMENTAL CONSEQUENCES (CONTINUED)

Alternative A	Alternative B	Alternative C	Alternative D
Action/Impact	Action/Impact	Action/Impact	Action/Impact
With respect to wetlands, alternative A is consistent with relevant law and policy. The natural recovery of wetlands would be consistent with NPS *Management Policies 2006* 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.	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: "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) 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)(l) Guidelines" (USACE 2010). 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).	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: "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) 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)(l) Guidelines" (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) are likely to be excepted from a statement of findings (per section 4.2.1 of NPS Procedural Manual 77-1; NPS 2002a).	alternative D would contribute an appreciable adverse increment to the overall cumulative impact. 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: "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) 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)(l) Guidelines" (USACE 2010). Lastly, any future actions would be reviewed by

TABLE 2-6. SUMMARY OF ENVIRONMENTAL CONSEQUENCES (CONTINUED)

Alternative A	Alternative B	Alternative C	Alternative D
Action/Impact	Action/Impact	Action/Impact	Action/Impact
			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).
Eelgrass			
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. 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, (2) essential fish habitat (habitat of particular concern) under the Groundfish Plan, and (3) native species and natural processes encouraged	Overall, alternative B would result in long-term moderate adverse impacts on eelgrass in Drakes Estero due 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-nutrient content, extensive tidal flushing, and proximity to nutrient-rich upwelling zones along the Pacific coast. Finally, maintenance of oyster	Overall, alternative C would result in long-term moderate adverse impacts on eelgrass in Drakes Estero due 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 and 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 high sediment-nutrient content, extensive tidal flushing, and proximity to nutrient-rich upwelling zones along the Pacific coast. Finally,	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, maintenance of oyster racks within Drakes Estero would prolong the erosional condition that is occurring under the racks. These adverse impacts

TABLE 2-6. SUMMARY OF ENVIRONMENTAL CONSEQUENCES (CONTINUED)

Alternative A	Alternative B	Alternative C	Alternative D
Action/Impact	Action/Impact	Action/Impact	Action/Impact
by NPS Management Policies 2006.	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. 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.	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. 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.	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. 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.
Wildlife and Wildlife Habitat: Benthic Fauna			
Overall, alternative A would result in long-term beneficial impacts on native benthic fauna because the termination of DBOC operations and	Overall, alternative B would result in long-term moderate adverse impacts on native benthic fauna due to an additional 10 years of DBOC	Overall, alternative C would result in long-term moderate adverse impacts on benthic fauna due to an additional 10 years of commercial shellfish	Overall, alternative D would result in long-term moderate adverse impacts on native benthic fauna due to an additional 10 years of DBOC

TABLE 2-6. SUMMARY OF ENVIRONMENTAL CONSEQUENCES (CONTINUED)

Alternative A	Alternative B	Alternative C	Alternative D
Action/Impact	Action/Impact	Action/Impact	Action/Impact
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. 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 interfere with natural processes and habitat (NPS 2006d).	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 Didemnum). 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 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	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 Didemnum). 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. 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	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 Didemnum). 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. 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

TABLE 2-6. SUMMARY OF ENVIRONMENTAL CONSEQUENCES (CONTINUED)

Alternative A	Alternative B	Alternative C	Alternative D
Action/Impact	Action/Impact	Action/Impact	Action/Impact
	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. 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.	the rocky California coast but is only likely to be found in Drakes Estero in larval form.	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.
Wildlife and Wildlife Habitat: Fish			
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. Alternative A would result in a more natural 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	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 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.	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 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.	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 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.

TABLE 2-6. SUMMARY OF ENVIRONMENTAL CONSEQUENCES (CONTINUED)

Alternative A	Alternative B	Alternative C	Alternative D
Action/Impact	Action/Impact	Action/Impact	Action/Impact
community. The cumulative impact would be beneficial, and alternative A would contribute a noticeable beneficial increment to the overall cumulative impact. 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.	The cumulative impact would be long-term beneficial, and alternative B would contribute a noticeable adverse increment to the overall beneficial cumulative impact. 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.	The cumulative impact would be long-term beneficial, and alternative C would contribute a noticeable adverse increment to the overall beneficial cumulative impact. 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.	The cumulative impact would be long-term beneficial, and alternative D would contribute a noticeable adverse increment to the beneficial cumulative impact. 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.
Wildlife and Wildlife Habitat: Harbor Seals			
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. 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	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 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	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 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	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 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

TABLE 2-6. SUMMARY OF ENVIRONMENTAL CONSEQUENCES (CONTINUED)

Alternative A	Alternative B	Alternative C	Alternative D
Action/Impact	Action/Impact	Action/Impact	Action/Impact
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. 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).	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. 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 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	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. 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 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	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. 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 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

TABLE 2-6. SUMMARY OF ENVIRONMENTAL CONSEQUENCES (CONTINUED)

Alternative A	Alternative B	Alternative C	Alternative D
Action/Impact	Action/Impact	Action/Impact	Action/Impact
	required.	required.	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.
Wildlife and Wildlife Habitat: Birds			
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 A would be consistent with the goals set forth in both NPS Management Policies 2006 and the MBTA. 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). The MBTA (16 USC 703–712, as amended) makes it illegal for people to "take" migratory	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. With respect to birds, alternative B 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	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. With respect to birds, alternative C 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	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 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

TABLE 2-6. SUMMARY OF ENVIRONMENTAL CONSEQUENCES (CONTINUED)

Alternative A	Alternative B	Alternative C	Alternative D
Action/Impact	Action/Impact	Action/Impact	Action/Impact
birds, their eggs, feathers or nests.	USC 703–712, as amended), which makes it illegal to "take" migratory birds, their eggs, feathers or nests.	USC 703–712, as amended), which makes it illegal to "take" migratory birds, their eggs, feathers or nests.	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.
Special-Status Species			
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, 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.	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). UWFWS 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.	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). UWFWS 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.	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, 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

TABLE 2-6. SUMMARY OF ENVIRONMENTAL CONSEQUENCES (CONTINUED)

Alternative A	Alternative B	Alternative C	Alternative D
Action/Impact	Action/Impact	Action/Impact	Action/Impact
			that are listed under the Endangered Species Act" (NPS 2006d). UWFWS 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.
Coastal Flood Zones			
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. 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 in the event of a flood event.	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, 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.	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, 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. NPS guidelines require that new actions within the	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 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

TABLE 2-6. SUMMARY OF ENVIRONMENTAL CONSEQUENCES (CONTINUED)

Alternative A	Alternative B	Alternative C	Alternative D
Action/Impact	Action/Impact	Action/Impact	Action/Impact
	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.	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.	long-term moderate adverse, and alternative D would contribute an appreciable adverse increment to the cumulative impact. 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.
Water Quality			
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 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	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 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	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) 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	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 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

TABLE 2-6. SUMMARY OF ENVIRONMENTAL CONSEQUENCES (CONTINUED)

Alternative A	Alternative B	Alternative C	Alternative D
Action/Impact	Action/Impact	Action/Impact	Action/Impact
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. 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."	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. 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."	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. 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."	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. 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."
Soundscapes			
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 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,	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 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	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 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	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 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

TABLE 2-6. SUMMARY OF ENVIRONMENTAL CONSEQUENCES (CONTINUED)

Alternative A	Alternative B	Alternative C	Alternative D
Action/Impact	Action/Impact	Action/Impact	Action/Impact
and alternative A would contribute an appreciable beneficial increment to the cumulative impact. 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.	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. 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 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.	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. 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 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.	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. 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 under that impact topic.

TABLE 2-6. SUMMARY OF ENVIRONMENTAL CONSEQUENCES (CONTINUED)

Alternative A	Alternative B	Alternative C	Alternative D
Action/Impact	Action/Impact	Action/Impact	Action/Impact
Wilderness			
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: ▪ cultivation of nonnative shellfish (approximately 585,000 in 2010) ▪ 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 ▪ motorboat travel taking place for up to 8 hours per day, 6 days per week, in approximately 740 acres of Drakes Estero ▪ generation of human-caused noise affecting wilderness The cumulative impact would be long-term and beneficial, and alternative A would contribute an appreciable beneficial increment to the cumulative impact. 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 preclude wilderness designation (NPS 2006d).	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: ▪ 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) ▪ 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 ▪ 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 ▪ generation of human-caused noise affecting wilderness (emanating from both inside and outside wilderness) The cumulative impact would be long-term major adverse, and alternative B would contribute an appreciable adverse increment to the cumulative impact. Alternative B would prevent NPS from fulfilling its obligations under the acts designating wilderness within the Seashore—PL 94-544 and PL 94-	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: ▪ 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) ▪ 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 ▪ 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 ▪ generation of human-caused noise affecting wilderness (emanating from both inside and outside wilderness) The cumulative impact would be long-term major adverse, and alternative C would contribute an appreciable adverse increment to the cumulative impact. Alternative C would prevent NPS from fulfilling its obligations under the acts designating wilderness within Point Reyes National Seashore—PL 94-	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: ▪ 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) ▪ 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 ▪ 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 ▪ generation of human-caused noise affecting wilderness (emanating from both inside and outside wilderness) The cumulative impact on wilderness would be long-term major adverse, and alternative D would contribute an appreciable adverse increment to the cumulative impacts. Alternative D would prevent NPS from fulfilling its obligations under the acts designating wilderness within Point Reyes National Seashore—PL 94-

TABLE 2-6. SUMMARY OF ENVIRONMENTAL CONSEQUENCES (CONTINUED)

Alternative A	Alternative B	Alternative C	Alternative D
Action/Impact	Action/Impact	Action/Impact	Action/Impact
	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.	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.	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 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	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 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	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 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	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 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

TABLE 2-6. SUMMARY OF ENVIRONMENTAL CONSEQUENCES (CONTINUED)

Alternative A	Alternative B	Alternative C	Alternative D
Action/Impact	Action/Impact	Action/Impact	Action/Impact
cumulative impact would be beneficial, and alternative A would contribute an appreciable increment to the overall beneficial cumulative impacts. 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).	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. 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.	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. 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 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.	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. 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.

TABLE 2-6. SUMMARY OF ENVIRONMENTAL CONSEQUENCES (CONTINUED)

Alternative A	Alternative B	Alternative C	Alternative D
Action/Impact	Action/Impact	Action/Impact	Action/Impact
			§§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.
Socioeconomic Resources			
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 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	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 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

TABLE 2-6. SUMMARY OF ENVIRONMENTAL CONSEQUENCES (CONTINUED)

Alternative A	Alternative B	Alternative C	Alternative D
Action/Impact	Action/Impact	Action/Impact	Action/Impact
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. 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.			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. 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.
NPS Operations			
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 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	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 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	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 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	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 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

TABLE 2-6. SUMMARY OF ENVIRONMENTAL CONSEQUENCES (CONTINUED)

Alternative A	Alternative B	Alternative C	Alternative D
Action/Impact	Action/Impact	Action/Impact	Action/Impact
contribute noticeable adverse increment to the overall cumulative impact.	cumulative impact would be long-term minor adverse, and alternative B would contribute a noticeable adverse increment to the overall cumulative impact.	cumulative impact would be long-term minor adverse, and alternative C would contribute a noticeable adverse increment to the overall cumulative impact.	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.

ENDNOTES

i. Attachment 10b to the letter from Drakes Bay Oyster Company to Point Reyes National Seashore on November 15, 2010 regarding culture beds (November 2007). This attachment is a map depicting the beds within Drakes Estero as of November 2007. The map notes 147 acres of cultivation; however, the measurement contained within this document (142 acres) is based on GIS measurements of a digitized version of this map.

ii. Letter from Drakes Bay Oyster Company to Point Reyes National Seashore on March 15, 2011, regarding Lease M-438-01 lease line.

> "The California Department of Fish and Game (CDFG) informed Drakes Bay Oyster Company (DBOC) that the original Drakes Estero lease boundary lines were drawn on the kitchen table of Charlie Johnson's home. The intent, at the time, was to create a lease area that included all of the existing shellfish beds. The crude mapping method used, without benefit of current, modern-day technology, not surprisingly turned out to be inaccurate and resulted in an error. Many years later, CDFG realized that the rudimentarily-drawn lease lines errantly crossed Bed 6."

iii. Letter from Drakes Bay Oyster Company to California Department of Fish and Game on May 10, 2010, regarding Lease M-438-01—boundary revision.

> "Drakes Bay Oyster Company (DBOC) requests that the revised lease boundary lines be approved so that the historic oyster racks can remain in use as they have for roughly 50 years and the lease line can be moved away from the seal haul out area along the main channel."

iv. Letter from Drakes Bay Oyster Company to California Coastal Commission on January 31, 2008, regarding CCC-07-CD-04 Drakes Bay Oyster Company (section 3.2.10 of Consent Order).

> "Presently, and since Drakes Bay Oyster Company has been in contract with the California Department of Fish and Game under lease numbers M438-01 and M438-02, oyster have only been grown in the 'cultivation area' as defined in provision 3.2.11. No oysters will be grown outside of this cultivation area. The oysters currently being cultivated in Drakes Estero are Pacific oysters (Crassostrea gigas)."

v. Letter from Drakes Bay Oyster Company to California Coastal Commission on January 31, 2008 regarding CCC-07-CD-04 Drakes Bay Oyster Company (section 3.2.10 of Consent Order).

> "Small numbers of European flat oysters (Ostrea edulis) and Kumamoto oysters (Crassostrea sikamea), which were planted by the Johnson's Oyster Company prior to 2005, still exist within the cultivated area."

vi. Letter from Drakes Bay Oyster Company to California Coastal Commission on January 31, 2008 regarding CCC-07-CD-04 Drakes Bay Oyster Company (section 3.2.10 of Consent Order).

> "Small numbers of European flat oysters (Ostrea edulis) and Kumamoto oysters (Crassostrea sikamea), which were planted by the Johnson's Oyster Company prior to 2005, still exist within the cultivated area."

vii. Letter from Drakes Bay Oyster Company to California Coastal Commission on January 31, 2008, regarding CCC-07-CD-04 Drakes Bay Oyster Company (section 3.2.10 of Consent Order).

> "No oyster species other than the Pacific oyster and the European flat oyster will be planted in Drakes Estero by the Drakes Bay Oyster Company without prior approval from the California Department of Fish and Game, the California Fish and Game Commission and the California Coastal Commission. Kumamoto oysters are slow growing, and require approximately double the

> amount of time that the Pacific oyster takes to reach maturity. Most of the Kumamoto oysters that exist in Drakes Estero are now reaching maturity. Drakes Bay oyster Company will remove all of these Kumamoto oysters from Drakes Estero by August, 2008."

viii. Letter from Point Reyes National Seashore Superintendent, to Drakes Bay Oyster Company, December 22, 2009, regarding cultivation of Manila clams, site development request, and additional information on Manila clams.

> "At this time, we would like to request additional information on Manila clam production. Please provide a proposal that includes location and size of growing area, approximate number of bags and clams, seed origin, history of production, and other details on the production of Manila clams. With this information we will use our standard process to meet our environmental compliance responsibilities."

ix. Letter from Drakes Bay Oyster Company to Point Reyes National Seashore on December 29, 2009.

> "As the cultivation of clams on lease M-438-0 1 has been authorized since 1993, no further approvals from NPS to cultivate clams are necessary. Please direct any questions you may have about this to the FGC."

x. Letter from Drakes Bay Oyster Company to California Coastal Commission on January 31, 2008, regarding CCC-07-CD-04 Drakes Bay Oyster Company (Section 3.2.10 of Consent Order)—Types of oysters grown in cultivation area.

> "Based on the planting records, it is expected that the total shellfish harvest from Drakes Estero be around 770,000 Lbs. If all environmental conditions are conducive, and mortality rates are low, as much as 850,000 Lbs could be harvested in a single year, based on the recent years' plantings. For the purposes of this consent order, the production limit should be set at 'approximately 850,000 Lbs' as 'current production'."

xi. Attachment 12c to the letter from Drakes Bay Oyster Company to Point Reyes National Seashore on November 15, 2010, regarding oyster rack GPS data. This attachment is a spreadsheet listing rack condition, length, and GPS location.

xii. Attachment 12c to the letter from Drakes Bay Oyster Company to Point Reyes National Seashore on November 15, 2010, regarding oyster rack GPS data. This attachment is a spreadsheet listing rack condition, length, and GPS location.

xiii. Letter from Drakes Bay Oyster Company to California Coastal Commission on March 16, 2010, regarding Coastal Development Permit Application No: 2-06-003—response to CCC letter dated March 9, 2010.

> "French tubes replace the Japanese hanging cultch method and can be used on all racks."

xiv. Attachment 10a to the letter from Drakes Bay Oyster Company to Point Reyes National Seashore on November 15, 2010, regarding oyster production/rack culture/cluster oysters. "Practice Protocols – Japanese Hanging Cultch Method," including list of items associated with this type of culture.

xv. Attachment 10a to the letter from Drakes Bay Oyster Company to Point Reyes National Seashore on November 15, 2010, regarding oyster production/rack culture/cluster oysters. "Practice Protocols – French Tube (oyster stick) Culture," including list of items associated with this type of culture.

> "Tubes are hung on racks for approximately 12 months."

xvi. Letter from Drakes Bay Oyster Company to Point Reyes National Seashore on March 4, 2011, regarding supplemental scoping information.

> "The photos show 'cubes' of 'French tubes,' also known as 'oyster sticks.' This was a step once used by DBOC in the French tube oyster culture. In the past, DBOC set larvae on the tubes in the outdoor setting tanks and then let the microscopic spat begin to grow on the tubes in the cubes on Bed 7 for a few weeks before hanging the tubes on the racks. DBOC has found this step to be unnecessary, and therefore this step is no longer used. Currently, DBOC brings the tubes directly to the racks following the setting process."

xvii. Attachment 12c to the letter from Drakes Bay Oyster Company to Point Reyes National Seashore on November 15, 2010, regarding oyster rack GPS data. This attachment contains a table of GPS data points and measurements of the DBOC racks in Drakes Estero.

xviii. Attachment 10d to the letter from Drakes Bay Oyster Company to Point Reyes National Seashore on November 15, regarding oyster production (harvest area). This attachment contains a list of harvest areas (otherwise referred to in the document as culture beds) and the type of culture that takes place in each bed.

xix. Attachment 10b to the letter from Drakes Bay Oyster Company to Point Reyes National Seashore on November 15, 2010, regarding oyster production/bottom bags. Diagrams of bottom bags were shown on this attachment.

xx. Letter from Drakes Bay Oyster Company to Point Reyes National Seashore on March 4, 2011, regarding supplemental scoping information.

> "Currently, there are no permanent moorings in Drakes Estero. Each barge has its own anchor for occasional use. DBOC rules are to anchor barges in deep water."

xxi. Letter from Drakes Bay Oyster Company to permitting agencies on March 25, 2011 regarding Emergency Repair Permit Applications for Damages Caused by the March 19 & 20, 2011 Wind Storm.

> "South Pier: Remove and properly dispose of remaining portions of the pier. DBOC does not plan to replace the South Pier."

xxii. Letter from Drakes Bay Oyster Company to California Coastal Commission on October 5, 2009 regarding Coastal Development Permit Application No: 2-06-003—Additional documentation in response to request by California Coastal Commission in letter dated June 10, 2009.

> "42. Replace existing 12' X 60' floating dock at the end of the oyster washing dock.
> 49. Installation of one 8-foot by 40-foot storage container.
> 54. Installation of a temporary 8-foot by 40-foot container for oyster shucking and packing."

xxiii. Letter from Drakes Bay Oyster Company to California Coastal Commission on March 16, 2010, regarding Coastal Development Permit Application No: 2-06-003 – Response to CCC letter dated March 9, 2010.

> "4. Two of the five setting tanks are 10' in diameter and 4' deep and three of the tanks at 7' in diameter and 4' deep.
>
> 5. One of the pumps is always running to provide water to the hatchery and setting systems. During nonworking hours, the one horsepower pump provides enough flow. While employees are washing oysters, the five horsepower pump provides enough flow for the hatchery and the washing. The pumps never operate simultaneously. They are actually wired and controlled so that only one pump can operate at any one time.
>
> 6. The outdoor setting tanks are filled and remain full for about 4 days during the setting period. After 4 days, to feed the juvenile oysters and cool the water slowly, raw seawater flows through tanks at about 5 GPM for the next 3 days."

xxiv. Letter from Drakes Bay Oyster Company to Point Reyes National Seashore on November 15, 2010, regarding housing.

> "DBOC provides five homes with a total of 14 bedrooms for its employees; and in some cases, their families."

xxv. Email from Associate Marine Biologist, California Department of Fish and Game Aquaculture and Bay Management Project, to Point Reyes National Seashore, on May 26, 2011, regarding Escrow account for DBOC.

> "Turns out the account was never transferred to DBOC when the lease was transferred. The bank indicated that they spoke to the Johnson's about the necessary documentation needed to transfer the account to DBOC, but it was never followed through. ... I will work with DBOC to establish a new agreement and discuss what the estimated clean-up costs are currently and how much should be set-aside in the escrow account."

xxvi. Letter from Director, California Department of Fish and Game to Superintendent Point Reyes National Seashore, May 15, 2007, regarding Drakes Bay Oyster Company lease status.

> "Consistent with article 1, section 25 of the California Constitution, this conveyance carried a reservation of the right to fish in the waters overlying these lands. Although the right to fish extends to both commercial and sports fishing, it does not extend to aquaculture operations. Regardless if its purpose is commercial or recreational, *fishing* involves the take of public trust resources and is therefore distinct from aquaculture, which is an agricultural activity involving the cultivation and harvest of private property."

xxvii. Letter from Drakes Bay Oyster Company to California Coastal Commission on January 30, 2008, regarding CCC-07-CD-04 Drakes Bay Oyster Company (section 3.2.6 of Consent Order).

> "Section 3.2.6 - HARBOR SEAL PROTECTION AREAS. The Consent Cease and Desist Order temporarily limits the use of growing areas to that which was actively growing oysters when the California Department of Public Health staff, using a GPS, identified those areas except Bed 17. Bed 17 is shown in its entirety rather than only the actively used portion. See Exhibit 7a for individual bed locations. As you will see in exhibit 7b the 2007 -2008 Annual Sanitary Survey. The Approved Area Bed 17 is shown in white. This depicts the entire 25.46 acres of fully approved shellfish growing waters. The Consent Order Seal Protection Area bisected this Approved Area Bed 17. No oysters were being grown prior to the Consent Order or are being grown in the portion of Bed l7 that now falls within the Seal Protection Area. Therefore, no oysters either need or needed to be removed. In reference to oysters being grown in Approved Area Bed 17, outside of the Seal Protection Area; we utilize the entire area as shown."

xxviii. Letter from Drakes Bay Oyster Company to Point Reyes National Seashore on March 15, 2011, regarding Lease M-438-01 lease line.

> "The area to be removed is the area nearest the main channel where harbor seals haul out. The edge of the lease, therefore, will be more than 500' away from the main channel haul outs. This distance exceeds the minimum setbacks of both the Marine Mammal Act and the more restrictive 1992 multi-agency Drakes Estero Harbor Seal Protection Protocols. Lastly, these new setbacks will alleviate the need for the temporary seal protection areas which were added as a precautionary measure by the California Coastal Commission."

xxix. Letter from Drakes Bay Oyster Company to Point Reyes National Seashore on March 5, 2011, regarding boat parking and floating dock area dredging.

> "The area of shell debris removal is approximately 60' x 30'. The depth of the dredging in this area will vary from 0'0" to approximately 3'0" near the pier. The approximate total volume of dredged material is approximately 100 cubic yards."

xxx. Letter from Drakes Bay Oyster Company to permitting agencies on April 4, 2011, regarding Drakes Bay Oyster Farm Emergency Repair Project Description. This packet of information distributed among agencies, including the NPS (specific agencies are unspecified), describes DBOC's proposal for site repairs required following March 2011 high wind event damage.

xxxi. Letter from Drakes Bay Oyster Company to permitting agencies on March 25, 2011, regarding Emergency Repair Permit Applications for Damages Caused by the March 19 & 20, 2011 Wind Storm. This packet of information distributed among agencies, including the NPS (specific agencies are unspecified), describes DBOC's proposal for site repairs required following March 2011 high wind event damage.

xxxii. Letter from Drakes Bay Oyster Company to Point Reyes National Seashore on March 15, 2011, regarding Lease M-438-01 lease line. Attachments to this letter show the revised lease boundaries proposed by DBOC.

xxxiii. Letter from Drakes Bay Oyster Company to California Department of Fish and Game on April 27, 2010, regarding Lease M-428-01.

> "Drakes Bay Oyster Company (DBOC) requests that the following native species be added to the list of approved species for cultivation on lease No. M-438-01:
>
> 1. Olympia oyster (Ostrea conchaphila) Olympia oysters are indigenous to Drakes Estero and currently exist in Drakes Estero.
>
> 2. Purple Hinged Rock Scallops (Hinnites multirugosus). Purple Hinged Rock Scallops are indigenous to Drakes Estero and currently exist in Drakes Estero. Purple Hinged Rock Scallops are already an approved cultured species in Drakes Estero on lease No. M-438-02 which is located within M-438-01.
>
> Currently, Pacific oysters (C. gigas), European Flat oysters (Ostrea edulis) and Manila clams (Venerupis phippinarum) are approved for cultivation on M-438-01. The net effect of this request will be to add two native species of bivalve shellfish to lease M-438-01."
>
> And letter from Drakes Bay Oyster Company to Point Reyes National Seashore on March 4, 2011, regarding new cultured species request. "On January 26, 2011 Point Reyes National Seashore requested additional scoping information about the native Olympia oysters and the native Purple Hinged Rock Scallops. DBOC has been given a deadline of March 4, 2011 to provide all additional scoping information. This letter will provide additional information regarding native shellfish culture in Drakes Estero."

xxxiv. Letter from Drakes Bay Oyster Company to Point Reyes National Seashore Scientist on March 4, 2011, regarding new cultured species request.

> "DBOC has hoped to add native species to its State water bottom lease for several years. There are a number of reasons that have contributed to our desire to add these natives." This letter goes on to give detailed background on Olympia oysters and purple-hinged rock scallops.

xxxv. Letter from Drakes Bay Oyster Company to California Department of Fish and Game on April 27, 2010, regarding Lease M-428-01.

> "Drakes Bay Oyster Company (DBOC) requests that the following native species be added to the list of approved species for cultivation on lease No. M-438-01:

> 1. Olympia oyster (Ostrea conchaphila) Olympia oysters are indigenous to Drakes Estero and currently exist in Drakes Estero. 2. Purple Hinged Rock Scallops (Hinnites multirugosus). Purple Hinged Rock Scallops are indigenous to Drakes Estero and currently exist in Drakes Estero. Purple Hinged Rock Scallops are already an approved cultured species in Drakes Estero on lease No. M-438-02 which is located within M-438-01. Currently, Pacific oysters (C. gigas), European Flat oysters (Ostrea edulis) and Manila clams (Venerupis phippinarum) are approved for cultivation on M-438-01. The net effect of this request will be to add two native species of bivalve shellfish to lease M-438-01. No new culture methods will be required to grow these additional shellfish species and all seed stock will be certified by CDFG before planting."

xxxvi. Letter from Drakes Bay Oyster Company to Point Reyes National Seashore on March 4, 2011, regarding new cultured species request.

> "Similar to the native oysters, DBOC has been planning for years to re-establish the native scallop production in Drakes Estero. DBOC has been studying this species and recognizes the challenges in producing scallop seed and rearing scallops. Hatchery techniques are less established for scallops than they are for oysters. Currently, DBOC is working with Sea Grant on a Purple Hinged Rock Scallop hatchery techniques grant (attachment g). This grant proposal is in draft form and is confidential. If approved, DBOC plans to participate in this three to four year project that will ultimately provide the necessary training for DBOC staff to perform all hatchery operations on-farm. This species takes approximately four years to reach market size (approximately 1 pound). This is a long term project that will require significant research, training and investment. DBOC is looking forward to getting started."

xxxvii. Letter from Drakes Bay Oyster Company to California Coastal Commission on January 31, 2008, regarding CCC-07-CD-04 Drakes Bay Oyster Company (Section 3.2.10 of Consent Order).

> "If all environmental conditions are conducive, and mortality rates are low, as much as 850,000 Lbs could be harvested in a single year, based on the recent years' plantings. "

xxxviii. Letter from Drakes Bay Oyster Company to Point Reyes National Seashore Scientist March 15, 2011, regarding Lease No. M-438-01 lease line adjustment. Attachment contained a map displaying proposed revisions overlaid on existing boundaries.

xxxix. Letter from Drakes Bay Oyster Company to Point Reyes National Seashore on November 24, 2010, regarding Drakes Bay Oyster Company comments on National Park Service scoping letter for Special Use Permit Environmental Impact Statement. This letter and its attachments were used as the basis for detail upon which this development concept is based.

xl. Letter from Drakes Bay Oyster Company to California Coastal Commission on March 16, 2010, regarding Coastal Development Permit Application No: 2-06-003—response to CCC letter dated March 9, 2010. Items listed in this most recent submittal regarding DBOC's Coastal Development Permit were used to construct this alternative.

xli. Letter (with attachments) from Drakes Bay Oyster Company to Point Reyes National Seashore on March 5, 2011, regarding alternate building design. Attachments to this letter provide the detail upon which this development concept is based.

xlii. Letter (with attachments) from Drakes Bay Oyster Company to Point Reyes National Seashore on March 5, 2011, regarding alternate building design.

> "The concept drawings do not show any worker housing except a manager's residence. Worker housing may be incorporated into the design in the future."