

ENVIRONMENTAL ASSESSMENT

Bodega Harbor Federal Channels

Maintenance Dredging for Fiscal Year 2017



US Army Corps of Engineers
San Francisco District

July 14, 2017

Finding of No Significant Impact (FONSI)

Environmental Assessment


BODEGA HARBOR FEDERAL CHANNELS – MAINTENANCE DREDGING

FISCAL YEAR 2017

July 2017

1. **Proposed Action.** In fiscal year 2017, The U.S. Army Corps of Engineers San Francisco District proposes to carry out maintenance dredging of the Bodega Harbor Federal Channels to the authorized depth of 12 feet MLLW, plus 2 feet of overdepth. Approximately 110,000 cubic yards of sediment will be dredged from the federal navigation channels. For all dredging activities, an environmental (closed) bucket will be used to minimize sediment spillage over the side of the bucket as it is raised through the water column. Dredged sediment will be placed directly into ocean-going scows for transport. The scows will not be filled to more than 80% capacity to eliminate the possibility of inadvertent spillage. The sediment will either be disposed of at SF-DODS or, if clean sand up to station 100+00, placed at the shallow ocean disposal site SF-8. Dredging of the Bodega Harbor Federal Channels is scheduled to occur sometime between August and November 2017, and to last up to 60 calendar days.
2. **Reference.** Incorporated herein for reference is the Environmental Assessment—Bodega Harbor Federal Channels, Maintenance Dredging for Fiscal Year 2017, dated July 2017.
3. **Factors Considered.** Factors considered for this FONSI include impacts of sediment quality, water quality, biological resources (including benthic resources, threatened and endangered species, critical habitat, and essential fish habitat), air quality, and noise.
4. **Conclusion.** Based on the information obtained during preparation of the Environmental Assessment, the U.S. Army Corps of Engineers San Francisco District concludes that the proposed action will not have a significant impact on the quality of the human environment. Therefore, the preparation of an Environmental Impact Statement (EIS) is not necessary.

July 14, 2017
Date



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LIST OF ACRONYMS

ACHP	Advisory Council on Historic Preservation
AHPA	Archaeological and Historic Preservation Act
BB	Bodega Bay (w/ reference to sediment sampling numbers)
CAA	Clean Air Act
CDFW	California Department of Fish and Wildlife
C.F.R.	Code of Federal Regulations
CWA	Clean Water Act
CY	Cubic Yards
DPS	Distinct Population Segment
EA	Environmental Assessment
EEZ	Exclusive Economic Zone
EFH	Essential Fish Habitat
EIS	Environmental Impact Statement
ESA	Endangered Species Act
ESU	Evolutionary Significant Unit
FMP	Fisheries Management Plans
FR	Federal Register
GFNMS	Gulf of the Farallones National Marine Sanctuary
MHHW	Mean Higher High Water
MLLW	Mean Lower Low Water
MMPA	Marine Mammal Protection Act
MSA	Magnuson-Stevens Fishery Conservation and Management Act
NEPA	National Environmental Policy Act
NHPA	National Historic Preservation Act
NMFS	National Marine Fisheries Service
NOAA	National Oceanic and Atmospheric Administration
NRHP	National Register of Historic Places
PCE	Primary Constituent Element
RWQCB	Regional Water Quality Control Board
SAP	Sampling and Analysis Plan
SF-8	San Francisco Channel Bar Disposal Site
SF-DODS	San Francisco Deep Ocean Disposal Site
SHPO	State Historic Preservation Officer
SIP	State Implementation Plan
SPC	Spud Point Channel (w/ reference to sediment sampling numbers)
SUAD	Suitable for Unconfined Aquatic Disposal
USACE	United States Army Corps of Engineers
U.S.C.	United States Code
USCG	United States Coast Guard
USEPA	United States Environmental Protection Agency
USFWS	United States Fish and Wildlife Service

1.0 Introduction

Pursuant to the National Environmental Policy Act (NEPA) of 1969, the United States Army Corps of Engineers (USACE), San Francisco District, has prepared this Environmental Assessment (EA) to identify any direct, indirect, and cumulative impacts to the human environment resulting from the proposed maintenance dredging of the federal channels located at Bodega Bay, Sonoma County, California.

1.1 Purpose and Need of the Proposed Action

The purpose and need for the proposed action are similar. The *purpose* is to maintain the authorized depth of the federal navigation channels in Bodega Bay Harbor. The *need* for the action is to remove shoaled sediment from the channel, thereby achieving the project's overall purpose.

Bodega Bay is an important commercial fishing center that is also the only safe harbor between San Francisco and Noyo Harbor. Because the entrance to the harbor is protected from prevailing northwesterly and westerly winds and seas by Bodega Head, it provides safe passage for fishing and recreational craft throughout the year. Bodega Bay serves commercial fishing and recreational vessels, as well as a United States Coast Guard (USCG) search and rescue station. The Spud Point Marina has 250 permanent berths. The USACE is responsible for maintaining the federal navigation channels in Bodega Harbor to ensure safe navigation for the vessels navigating the bay.

Bodega Harbor experiences sedimentation from only a few sources, including ocean input through the narrow entrance, limited inflow from intermittent gulches, and sheet runoff. Over time, the unending natural process of gradual sediment accumulation will constrict navigation in the channels (shoaling) and cause a safety hazard. Periodic maintenance dredging is essential to the continued safe and efficient use of the federal channels and associated turning basins by commercial and recreational vessels and USCG search and rescue vessels. As such, it is USACE's responsibility, in coordination with the non-federal sponsor, to restore the harbor channels to their authorized depth of 12 feet mean lower low water (MLLW).

1.2 Project Location

The proposed dredging action is located in the federal navigation channels in Bodega Harbor, Sonoma County, California, as well as the transportation corridors and dredged material placement sites located off the nearshore from Bodega Harbor to San Francisco (Figure 1). Bodega Bay is a crescent-shaped bay that is bounded to the north by an abrupt hill – Bodega Head (Figure 2). Bodega Harbor (where the navigation channels are located) is located immediately north of Bodega Bay proper. Bodega Harbor is considered a lagoon. It is separated from Bodega Bay proper by the sandy Doran Spit and from the Pacific Ocean by the Bodega Head peninsula. Bodega Harbor lies just to the west of the San Andreas rift zone – a transform fault that forms the boundary between the Pacific Ocean plate and the North American continental plate.

Dredged material placement will occur at SF-DODS (55 miles west of the Golden Gate), and within the 3-mile zone of SF-8 (3 miles west of the Golden Gate). Dredged material will be transported between the Bodega Bay Harbor dredging locations and dredged material placement sites. Figure 1 shows the location of the federal navigation channels, dredged material transport corridor, and placement sites.

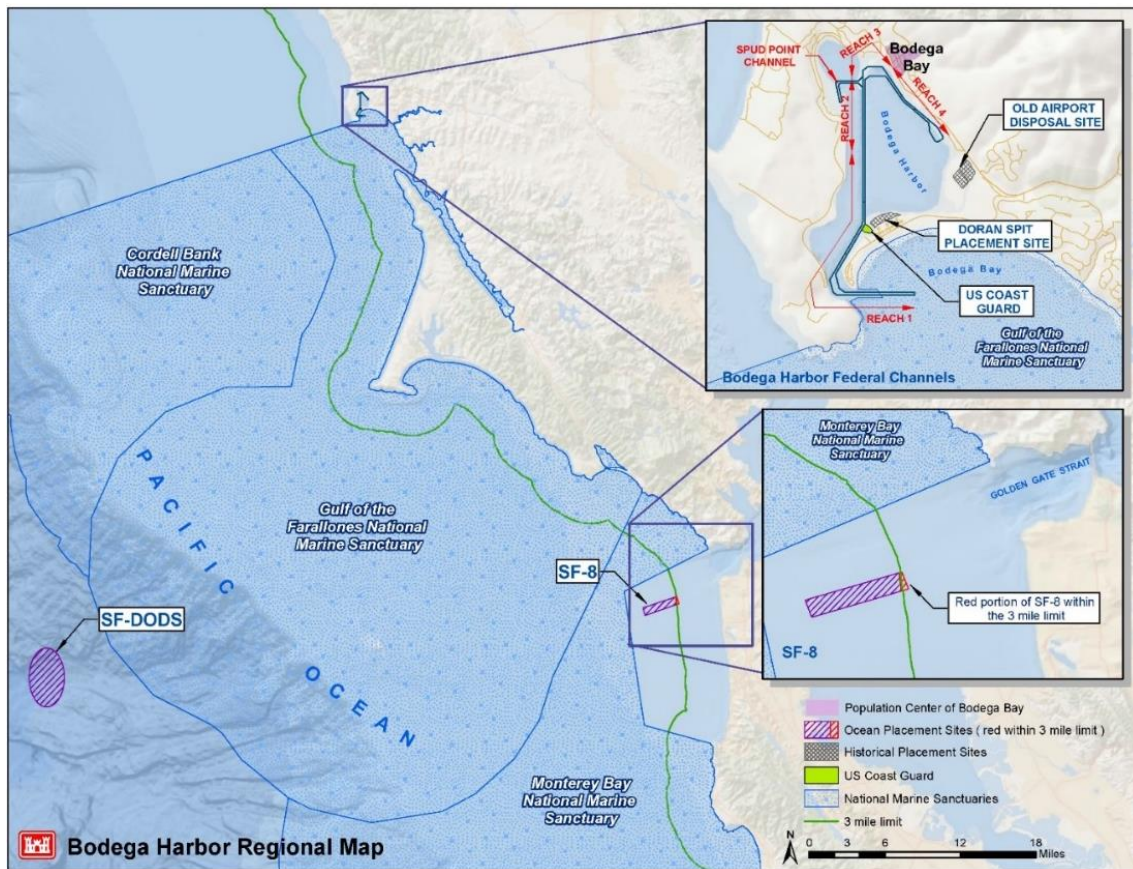


Figure 1: Bodega Harbor regional map illustrating its geographic relationship to the proposed disposal sites.

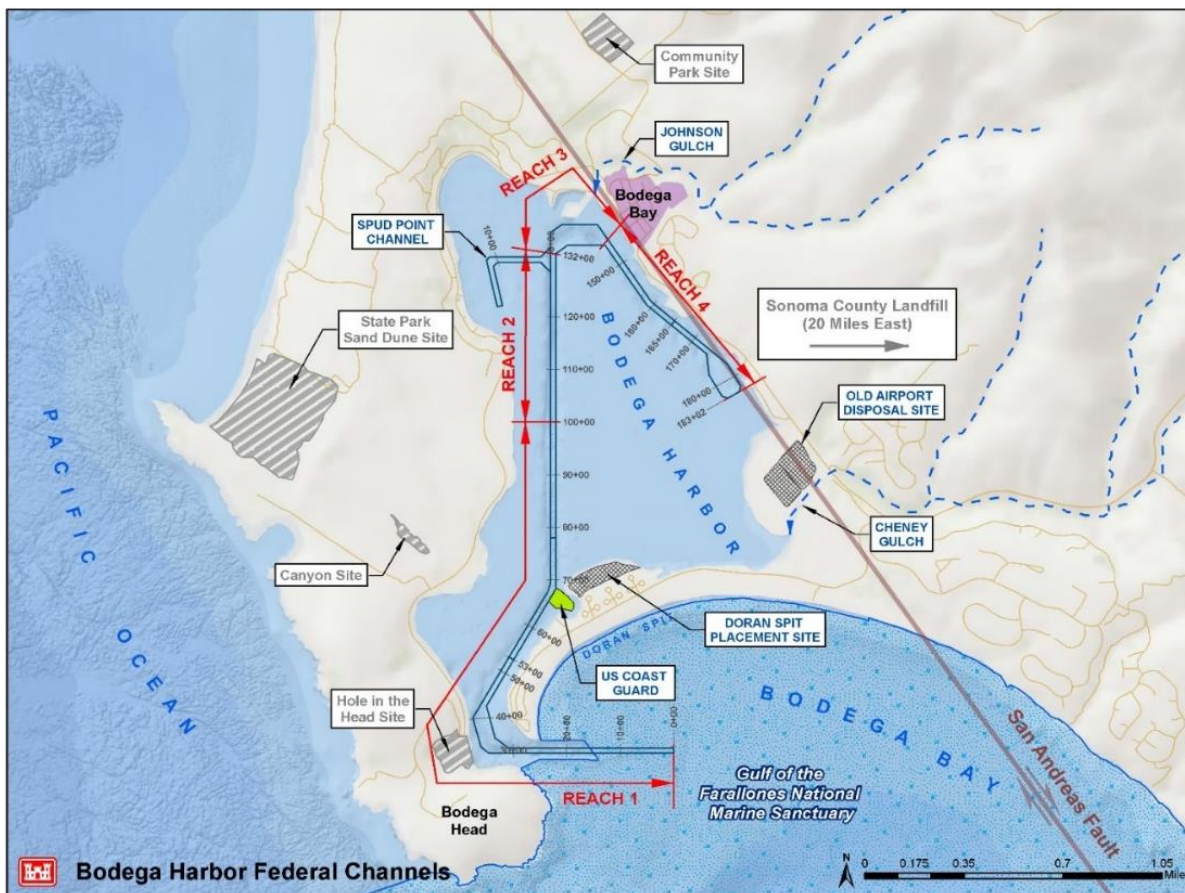


Figure 2: Bodega Harbor vicinity map showing the federal navigation channels, the San Andreas Fault, surrounding drainage pattern, and historical placement sites.

1.3 Project Authorization

Bodega Bay Harbor federal navigation channel was authorized by the Rivers and Harbors Act of 1938, Pub. L. No. 75-685, 54 Stat. 802. Completed in 1943, these improvements provided for the construction of channel entrance jetties, a bulkhead to retain the sand spit, and the shallow-draft navigation channels. In 1961, a major rehabilitation of the channels and south jetty was completed.

The federal navigation channels include the entrance channel and interior harbor channels. The entrance channel provides navigation access from the Pacific Ocean through Bodega Bay proper (outside of the harbor) to Bodega Harbor. The entrance channel extends approximately 1,600 feet from the harbor inlet into Bodega Bay. The shallow-draft navigation channels within the harbor include a 100-foot-wide, 16,020-foot-long channel dredged to 12 feet MLLW to the town of Bodega Bay. The channel continues southeasterly for 4,200 feet along the shore and has three turning basins. The first of the turning basins is 300 feet wide and 12 feet deep near the entrance channel. The remaining two are 400 feet wide and 12 feet deep. These are located at the town of Bodega Bay, and at the extreme inner end of the channel.

Construction of a baffled concrete-pile breakwater at Spud Point and an access channel from the existing federal channel to a proposed local marina (Spud Point Marina) were authorized by Congress on October 27, 1965, and the work was completed in 1975. These projects undergo regular USACE maintenance. In 1985, Sonoma County Regional Parks was required to prepare a plan to enhance wildlife habitat in Doran Marsh as mitigation for construction of the Spud Point Marina. The enhancement plan was implemented in 1993. The County of Sonoma Regional Parks Department is the non-federal sponsor for the project.

1.4 Previous Documentation

Previous environmental documentation prepared for this project and consulted in the preparation of this EA includes:

- Environmental Impact Statement, Bodega Bay Dredging, Preliminary Study, August 1970.
- The Natural Resources of Bodega Harbor, California Department of Fish and Game, 1975.
- Draft Environmental Statement, Navigation Improvements, Bodega Bay, California, August 1977.
- Environmental Assessment – Maintenance Dredging Bodega Bay Federal Channel, Bodega Bay, Sonoma County, California, February 1980.
- Spud Point Marina, Bodega Harbor – A Detailed Report on Fish and Wildlife Resources, U.S. Fish and Wildlife Service, Sacramento, California, January 1981.
- Environmental Impact Statement – Navigation Improvements, Bodega Bay, California, September 1981.
- Environmental Assessment – Operation and Maintenance Dredging Federal Channel, Bodega Bay Harbor, Sonoma County, California, July 1991.
- Final Environmental Assessment/Biological Assessment – Operation and Maintenance Dredging of the Bodega Harbor Federal Channel and U.S. Coast Guard Station Bodega Bay, Sonoma County, California, May 2004.

1.5 Proposed Action and No Action Alternatives

This section provides details of the proposed action and the no action (i.e., no dredging) alternatives. The no action alternative serves as the baseline for evaluating the effects of the proposed action. In considering the suitability of various action alternatives, the following policy, specified in 33 C.F.R. § 335.4, provides guidance in the selection of the best alternative:

The Corps of Engineers undertakes operations and maintenance activities where appropriate and environmentally acceptable. All practicable and reasonable alternatives are fully considered on an equal basis. This includes the discharge of dredged or fill material into waters of the U.S. or ocean waters in the least costly manner, at the least costly and most practicable location, and consistent with engineering and environmental requirements.

1.5.1 Project Action and Project Description

The proposed action is to dredge the federal navigation channels in Bodega Bay Harbor, transport dredged material to dredged material placement sites, and dispose of the material. The maintenance dredging cycle of the federal channels in Bodega Harbor is approximately every 12 years. The last dredging episode was in 2004 when approximately 112,000 cubic yards of sediment was dredged from the federal channels and the adjacent USCG search-and-rescue base and placed at SF-DODS and SF-8. The proposed dredging cycle is to occur between August and November 2017.

For the proposed 2017 maintenance dredging, the main federal navigation channel is divided into four reaches, plus the Spud Point Marina Channel (Figure 2):

- Reach 1 – Station 0+00 to 100+00
- Reach 2 – Station 100+00 to 132+00
- Reach 3 – Station 132+00 to 145+00
- Reach 4 – Station 145+00 to 183+02
- Spud Point Marina Channel – 0+00 to 19+95

The Spud Point Marina channel is considered separate from the main channel reaches. Reach 1 includes the Entrance Channel, with predominantly medium to very coarse clean sandy material, while Reaches 2, 3 and 4, and the Spud Point Marina Channel, consist of fine sand and silty muds. Dredging may be limited based on the availability of funds.

There is also an adjacent United States Coast Guard (USCG) station with its own small channel (10-foot standard depth) that is contiguous with the main federal channel. The USCG is responsible for search and rescue operations, homeland security, pollution response, and several other missions. In 2004, maintenance dredging of the USCG search and rescue station was coordinated with the federal maintenance dredging to save on mobilization and demobilization costs and other expenses.

The latest hydrosurvey (January 28 – 29, 2017) indicates that approximately 110,000 cubic yards (including allowable overdepth) of sandy/silty material needs to be dredged from the federal channels to maintain the authorized depth. Shoaled areas will be dredged to a depth of 12 feet MLLW, with up to 2 feet of allowable overdepth (for a maximum depth of 14 feet MLLW). Overdepth is authorized to accommodate for the imprecision that is inherent in mechanical dredging. Overdepth guidance allows for one-foot of paid overdepth and one-foot of non-paid overdepth (Figure 3). The estimated volumes per reach are (Total = 101,443 CY):

- Reach 1 (0+00 to 100+00) = 31,849 CY
- Reach 2 (100+00 to 132+00) = 73 CY
- Reach 3 (132+00 to 145+00) = 14,846 CY
- Reach 4 (145+00 to 183+02) = 54,675 CY
- Spud Point Marina (0+00 to 19+95) = 3,661 CY

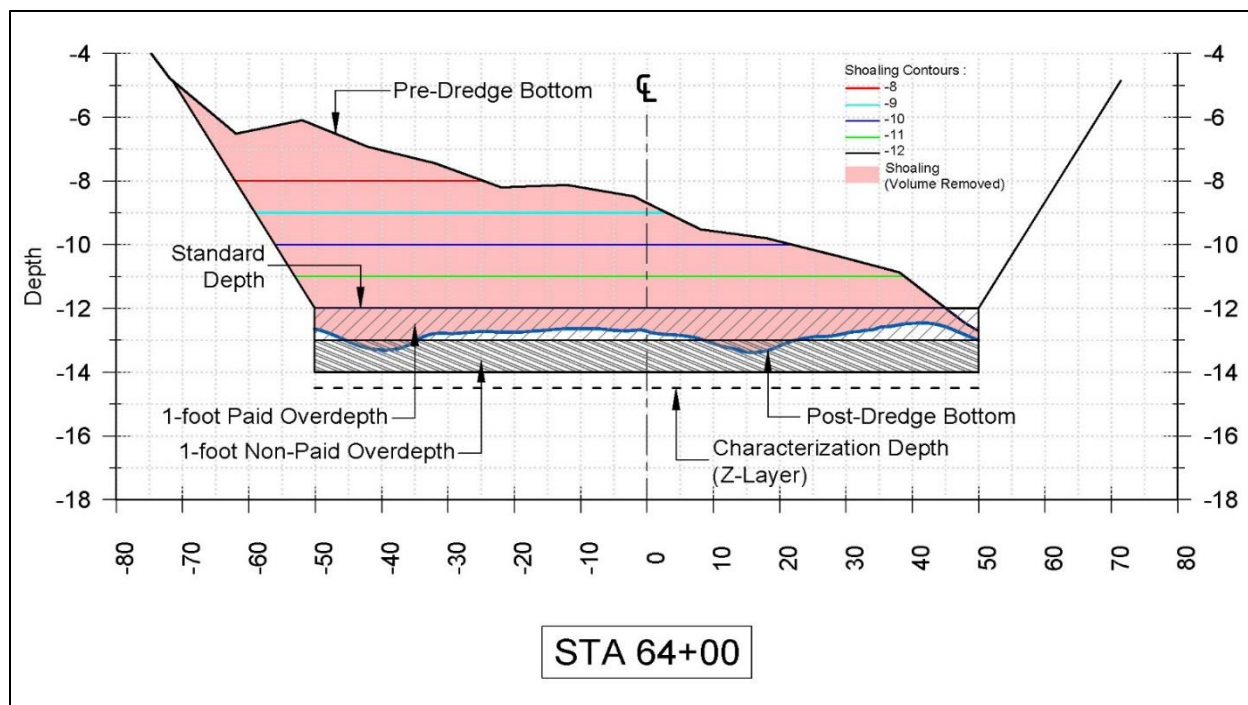


Figure 3: Sample channel profile illustrating various physical dimensions.

Dredging the federal channels will be conducted by clamshell with an environmental bucket. The clamshell will have a minimum capacity of 10 cubic yards. The environmental bucket is proposed to reduce turbidity that may affect eelgrass adjacent to the channel. The environmental bucket reduces turbidity because it is sealed at the top, thus preventing dredged material from spilling out and over the sides when the bucket is raised through the water column.

Dredged material will be placed in shallow barges (scows) for transport to the San Francisco Deep Ocean Disposal Site (SF-DODS) or the San Francisco Channel Bar Disposal Site (SF-8) dredged material disposal sites (Figure 1). Scows will be loaded to no more than 80 percent capacity because of the shallow depths of Bodega Harbor and the requirements for transporting dredged material through the Gulf of the Farallones National Marine Sanctuary. Under conditions set by USEPA for ocean disposal concurrence, double-handling of dredged sediment (i.e., moving sediment from smaller scows to larger scows during transport) will NOT be permitted for fear of incidental spillage (which would be considered an unauthorized discharge), and language to this effect will be added to the dredging contract.

Assuming a total of 110,000 cubic yards of shoaled sediment in the federal channels, a 70 percent efficiency for the bucket, and a scoop cycle of about 1.5 minutes, it will take approximate 10–12 hours shift to fill each scow. Thus, it is expected to take approximately 60 days in total (not including mobilizing and demobilizing equipment); however, dredging may be temporarily halted if inclement weather or rough seas prevent safe transport of dredged material to placement sites.

Once dredging is complete, post-dredge hydrosurveys will be conducted immediately following the dredging and will confirm the actual locations and volume of material that was dredged.

The proposed dredged material placement sites include SF-DODS and SF-8. SF-DODS is the nearest permanently designated deep-ocean disposal site to Bodega Harbor. This site is located off the Continental Shelf in approximately 8,200 to 9,800 feet of water, approximately 55 nautical miles offshore of the city of San Francisco, and 65 nautical miles from Bodega Harbor (Figure 1). It is a north-south aligned oval covering approximately 6.5 square mile. The United States Environmental Protection Agency (USEPA) officially designated the site in 1993. SF-DODS is permitted to receive 4.8 million cubic yards per year of dredged material, but it currently receives less than one-eighth of this volume.

Transporting material to SF-DODS requires large barges called scows. The larger size is required for safety reasons because of the weather and waves that may be encountered during transit. For shallow draft projects, such as Bodega Bay Harbor, oceangoing scows may be prevented, because of limiting depths, from entering the bay and, therefore, cannot be loaded at the dredge site. It is expected that the dredged material would be placed into ocean-going barges capable of making the 65-nautical-mile journey to the disposal site. Transport to SF-DODS will not entail any double handling of sediment along the way.

SF-8 is a large, sandy, ebb-tidal delta seaward of the entrance to San Francisco Bay with depths ranging from 35 to 45 feet MLLW. Its placement site is approximately 65 nautical miles south of Bodega Harbor. USACE proposes to use the easternmost sliver of SF-8, which lies within the 3-mile limit (Figure 1). This area is available for the placement of clean sediment that is greater than 80 percent sand. Similar to SF-DODS, it will be contractually required that dredged sediment transported to SF-8 will not entail any double handling to avoid incidental spillage.

1.5.2 No Action Alternative

Under the no action alternative, USACE would not take any action to maintain the federal channels and turning basins in Bodega Harbor. Shoaling would continue, and over time, safe and efficient navigation of vessel traffic in the Harbor would become difficult, dangerous, and eventually impossible. These unsafe conditions would have a negative impact on the local fishing industry and recreational boaters who use Bodega Harbor for shelter. Furthermore, continued shoaling would hinder USCG's search and rescue mission, eventually forcing the USCG base to close. The local economy and the community, which greatly depend on the harbor, would be adversely affected. Boats seeking refuge from storms would no longer be able to safely enter the harbor. Because the shoaling rate is not known—and probably varies with changes in climate patterns—it is not possible to predict with any certainty precisely when navigation would become untenable.

1.6 Historic Maintenance Dredging

Records of Bodega Harbor maintenance go back to the early 1960s (Table 1). During that time, there have been five dredging episodes, plus a sixth episode scheduled for 2017. The amount of material dredged has ranged from 69,000 to 383,000 cubic yards.

Table 1: Bodega Harbor historical dredging volumes.

<i>Fiscal Year</i>	<i>Contractor</i>	<i>Dredged (CY)</i>	<i>Cost/CY</i>	<i>Disposal Site</i>
1961	Shellmaker, Inc.	382,918	\$ 0.46	Upland
1969	Shellmaker, Inc.	99,720	\$ 1.07	Upland/ Beach
1980 - 1981	R & D Watson	69,609	\$ 1.00	Upland/ Beach
1992	Camenzind Dredging	69,082	\$ 4.50	Upland
2004	Dutra Dredging	112,133*	\$ 19.23	SF-DODS/ SF-8
<i>Total:</i>		<i>733,462</i>		

Notes:
CY = cubic yards;
* Includes a small volume for the USCG search-and-rescue station dock.

Historically, Bodega Harbor has been dredged by a contract mechanical dredge, and the material disposed of at the local upland site, except for the 2004 episode when all of the material went either to SF-DODS or to SF-8. A similar plan of action is proposed for the 2017 maintenance episode.

1.7 Environmental Compliance

Every USACE project must be consistent with federal law, and environmental compliance is accounted for in every USACE action. The environmental consistency implications of the proposed maintenance dredging of Bodega Harbor were considered as part of this EA. Specific federal environmental statutory requirements and the status of the project's compliance with the respective environmental laws and regulations are summarized below.

1.7.1 National Environmental Policy Act (42 U.S.C. § 4341 et seq.)

In compliance with NEPA (1969), the USACE is required to identify all direct, indirect, and cumulative impacts to the human environment that could be caused by the maintenance dredging of Bodega Harbor federal channels and the disposal of the dredged material. For projects or changes to old projects with potentially significant impacts, NEPA compliance is usually documented in an Environmental Impact Statement. For projects with less than significant impacts, EAs usually document NEPA compliance.

This EA was prepared in accordance with NEPA and the USACE's guidelines for implementing NEPA (33 CFR part 230). The draft EA will be circulated for the minimum 30-day period; the comment period for the draft document will occur between April 19 and May 18, 2017.

1.7.2 Endangered Species Act

The Endangered Species Act of 1973 (ESA) provides protection for federally threatened and endangered species. The United States Fish and Wildlife Service (USFWS) and National Marine Fisheries Service (NMFS) each determine which species need protection and maintain a list of threatened, endangered, and candidate species. Additionally, these agencies each designate species-specific areas of critical habitat.

The USACE has coordinated with the USFWS and NMFS regarding the potential effects of the proposed action on threatened and endangered species and designated critical habitat. On July 21, 2016, USFWS concurred with via email that the proposed project is not likely to adversely affect USFWS-listed species or critical habitat. On July 5, 2017, the NMFS issued a Letter of Concurrence agreeing that the proposed project is not likely to affect NMFS-managed listed species or critical habitat. The ESA effects analysis provided to the USFWS and NMFS is summarized in Section 2.4.2 of this EA. All coordination and documentation is further provided in Appendix A.

1.7.3 Magnuson-Stevens Fishery Conservation and Management Act and Essential Fish Habitat

The 1996 amendments to the Magnuson-Stevens Conservation and Management Act (MSA) set forth a number of new mandates for the NMFS, regional fishery management councils, and other federal agencies to identify and protect important commercially fished marine and anadromous fish habitat. The concept is similar to critical habitat under the Endangered Species Act. The measures that are recommended by NMFS are advisory for other agencies as opposed to mandatory.

The Essential Fish Habitat (EFH) mandates of the MSA represent an effort to integrate fisheries management and habitat management by stressing the ecological relationships between fishery resources and the environments upon which they depend. The MSA defines EFH as those waters and substrates that are necessary for fish spawning, breeding, feeding, or growth to maturity. Waters refer to aquatic areas and their associated physical, chemical, and biological properties that are used by fish, and may include areas historically used by fish. Substrates refers to sediment, hard bottom, or structures underlying the waters, and associated biological communities. Necessary refers to the habitat to support a sustainable fishery and the management of the species' contribution to a healthy ecosystem. Spawning, breeding, feeding, or growth to maturity refers to the full life cycle of a species. The EFH consultation process will ensure that federal agencies explicitly consider the effects of their actions on important habitats with the goal of supporting the sustainable management of marine fisheries.

The area for the Bodega Bay Harbor maintenance-dredging project is located within coastal waters identified as EFH for various life stages of fish species managed with Fishery Management Plans (FMP) under the MSA. These FMPs include the following plans: Pacific Groundfish FMP (1994), Pacific Coast Salmon FMP (July 1997), and Coastal Pelagics FMP (December 1998).

The USACE is coordinating with NMFS regarding the potential effects of the proposed action on EFH. A draft EFH assessment was prepared and submitted to NMFS in April 2017. On July 5, 2017, the NMFS issued a letter of concurrence stating that it "...has determined the proposed action would adversely affect EFH for various life stages of fish species managed under the Pacific Groundfish FMP, Coastal Pelagics FMP, or Pacific Coast Salmon FMP; however, the proposed action includes adequate measures to avoid, minimize, mitigate, or otherwise offset the adverse effects to EFH." The EFH effects analysis is summarized in Section 2.4.7 of this EA. All coordination and documentation is further provided in Appendix B.

1.7.4 Coastal Zone Management Act (16 U.S.C. § 1451 et seq.)

The Coastal Zone Management Act of 1972 requires that any federal activities in the coastal zone must be consistent with requirements established by the coastal management boards of the states in which the activities take place. Maintenance dredging of the Bodega Harbor federal channels, as well as disposal of dredged material at SF-DODS or SF-8, will require a consistency determination with the California Coastal Commission (CCC). The USACE, which is coordinating with the CCC regarding the proposed project, will submit a negative determination and a draft of this EA to the CCC.

1.7.5 Clean Air Act

The Clean Air Act (CAA) protects and enhances the quality of the air resources within the U.S., and protects public health from both long and short-term exposure to air contaminants. Under the CAA, the USEPA established a set of ambient air quality standards. In California, the California Air Resources Board established additional standards that are, in some cases, more stringent than those set by USEPA. As in all states, California has prepared, and is the primary enforcing authority for, a State Implementation Plan (SIP), which is a blueprint for achieving and maintaining the national and state ambient air quality standards.

Section 118(a) of the CAA provides that all federal agencies are subject to all state and local laws, regulations, and standards for air pollution control if the state and local laws are at least as stringent as those at the federal level, and provided that they have not been set aside by federal courts. Section 176(c) of the CAA provides that no federal agency shall engage in any activity that does not conform to a USEPA-approved SIP. Those requirements must be met by obtaining all necessary permits and approvals from state and local agencies prior to the start of project work.

The 1990 CAA amendments require federal agencies proposing projects to complete an analysis to determine whether the project conforms to the approved SIP. The USEPA promulgated final guidelines on preparation of the conformity analysis in 1993. The USEPA's final rule does not require a conformity analysis for proposed projects that are in attainment areas for national ambient air quality standards.

Bodega Bay is within the jurisdiction of the Northern Sonoma County Air Pollution Control District (NSCAPCD). At present, northern Sonoma county is in attainment for all state and national

standards. Therefore, it is not necessary to make a formal determination that the proposed project conforms to the SIP. Also, dredging and dredged material placement operations are exempt from a requirement of conformity with the SIP. The SIP, pursuant to the regulations implementing the CAA at 40 C.F.R. § 51.853(c)(2)(ix), states that:

... the requirements of this subpart shall not apply to maintenance dredging and debris disposal where no new depths are required, applicable permits are secured, and placement/disposal will be at an approved placement/disposal site.

The dredging and placement operations will still be required to comply with the NSCAPCD's emission limits. The equipment used in dredging and placement operations will not exceed the air control district emission limits. No further air quality analysis is provided in this EA.

1.7.6 Clean Water Act

Reduction of pollutants in discharges into waters of the U.S. is mandated by the Clean Water Act of 1972 (CWA), and such activities must comply with section 401 of the CWA of 1977, as amended, (33 U.S.C. § 1251 et seq.). Regulatory control of water quality is delegated to local Regional Water Quality Control Boards (RWQCBs). Those boards issue discharge permits that set limits on specifically monitored USEPA-determined water pollutants.

Material placed within the 3-mile zone of SF-8 will require a CWA Section 404(b)(1) analysis and a Section 401 Water Quality Certification. The San Francisco Bay Regional Water Quality Control Board is the Regional Water Board with Section 401 CWA regulatory authority over SF-8. The USACE is in the process of preparing a 404(b)(1) certification and obtaining appropriate authorization from the Regional Water Board. The final EA will be updated, as necessary, to include any water quality requirements of the WQC.

1.7.7 Marine Protection, Research, & Sanctuaries Act (33 U.S.C. § 1401 et seq.)

Section 102 of the Marine Protection, Research, and Sanctuaries Act of 1972 (*aka* the Ocean Dumping Act) sets guidelines for establishing and managing ocean disposal sites. USEPA and USACE co-manage USEPA-established ocean disposal sites. The USEPA "Test Manual" for ocean disposal, known as the Green Book, provides sediment chemistry guidelines for disposal of dredged material at these sites. USACE issues permits to private concerns to dispose of dredged material at ocean disposal sites. The closest ocean disposal site to Bodega Harbor is SF-DODS.

The federal channels in Bodega Harbor are outside the jurisdiction of the Gulf of the Farallones National Marine Sanctuary (GFNMS), but the area immediately outside the jetties and the harbor is within the GFNMS. Disposal of dredged material is a prohibited activity within this sanctuary, unless specifically authorized by the GFNMS director (15 C.F.R. § 922.82).

1.7.8 Marine Mammal Protection Act (16 U.S.C. § 1361 et seq.)

The Marine Mammal Protection Act of 1972 provides protection for marine mammals. Because of their high visibility and mobility, they can be easily seen and avoided. Marine mammals are not likely to be affected by this project.

1.7.9 National Historic Preservation Act (16 U.S.C. § 470 et seq.)

The National Historic Preservation Act of 1966 (NHPA) set forth national policy for recognizing and protecting historic properties. It established the National Register of Historic Places (NRHP), and created a State Historic Preservation Officer (SHPO) in each state and the Advisory Council on Historic Preservation (ACHP) of the Executive Branch. Under Section 106 of the act, federal agencies are required to take into account the effects of their undertakings on historic properties and provide the SHPO, Native American tribes, and interested parties an opportunity to comment on those undertakings.

The implementing regulations of Section 106 published by the ACHP, "Protection of Historic Properties," are found in 36 C.F.R. Part 800. The goal of the Section 106 review process is to identify historic properties that may be impacted by the undertaking, and seek ways to avoid the adverse effects, or when necessary, develop treatment measures (i.e., mitigation measures) to reduce the level of adverse effect. When an agency determines there is an adverse effect on historic properties, the ACHP is contacted to request comment. Historic properties are defined in federal law as those properties that are listed in, or meet the criteria for listing in, the NRHP. The criteria for determining National Register eligibility are found in 36 C.F.R. Part 60. Generally, cultural resources that exhibit information important to prehistory or history, and possess various aspects of integrity, would be eligible for inclusion in the NRHP as historic properties. Amendments to the Act (1986 and 1992) have strengthened the provisions for Native American consultation and their participation in the Section 106 review process.

In 2009, the USACE requested comment from the SHPO, and also Native American tribes and individuals through the Native American Heritage Commission regarding the maintenance dredging of the federal channels at Bodega Harbor. The Federated Tribes of Graton Rancheria, a federally recognized tribe whose ancestral lands include Bodega Bay, was invited to consult under the Section 106 process. The Federated Tribes of Graton Rancheria submitted a comment letter (Appendix E) concerning the possibility for an inadvertent discovery of cultural resources, both prehistoric and historic. The EA is updated to include the following language, which the project will comply with:

"If during excavation or other construction activities any previously unidentified or unanticipated historical, archaeological, and cultural resources are discovered or found, all activities that may damage or alter such resources will be temporarily suspended. Resources covered by this paragraph include but are not limited to: any human skeletal remains or burials; artifacts; shell, midden, bone, charcoal, or other deposits; rock or coral alignments, pavings, wall, or other constructed features; and any indication of agricultural or other human activities. Upon such discovery or find,

immediately notify the Contracting Officer so that the appropriate authorities may be notified and a determination made as to their significance and what, if any, special disposition of the finds should be made. Cease all activities that may result in impact to or the destruction of these resources. Secure the area and prevent employees or other persons from trespassing on, removing, or otherwise disturbing such resources.”

However, it is expected that the possibility of submerged cultural resources existing in the currently proposed dredging areas is remote, because the federal channels have been dredged multiple times. Dredging is designed to remove shoaled sediment within an established channel, and thus no dredging would occur in previously undisturbed areas outside the channels. A *Cultural Resources Assessment* (Appendix C) provides additional information. Cultural resources are not discussed further in this EA.

1.7.10 Archaeological and Historic Preservation Act (16 U.S.C. § 469 et seq.)

The Archaeological and Historic Preservation Act of 1974 (AHPA) provides for the preservation of historic and archaeological data that might otherwise be lost or destroyed because of any federal construction project. The AHPA authorizes the lead federal agency of a project, or the Secretary of the Interior, to undertake recovery or preservation of such data. Federal project funds, up to one percent of the project cost, may be used, or the lead agency may request the Secretary of the Interior to conduct the desired measures. In the event that significant cultural resources are encountered during the proposed maintenance dredging and disposal, and they are determined to be historic properties, treatment measures to recover important data could be authorized under the AHPA. Archeological and historic resources are not known to be present in the navigation channels and no additional analysis is included herein.

2.0 Existing Environmental Conditions and Potential Effects

This section discusses the existing environmental conditions in the project area and analyzes the potential effects of the proposed and no action alternatives on the quality of the human environment. It begins with a brief discussion of the regional environmental setting and continues with detailed analysis of only the environmental resources that have the potential to be affected by the proposed action. This section is organized such that the existing environmental resource is discussed first, followed by the effects of the proposed action and any cumulative effects. The environmental resources discussed herein include:

- Water quality
- Sediment quality
- Biological resources, including benthic resources, ESA and EFH protected resources (EFH includes the analysis of eelgrass), and marine mammals
- Noise

2.1 Regional Environmental Setting

Bodega Harbor is a small, shallow embayment with limited freshwater input. The average depth of the harbor is less than 2.5 feet MLLW in areas outside the 12-foot MLLW navigation channels. If the channels were not present, the harbor would likely have a gently sloping, uniform bottom gradient caused by the natural effect of tides, winds, and inflow of sediment from the ocean and upland areas. Johnson Gulch in the northern portion of the harbor and Cheney Gulch in the southeastern part provide intermittent freshwater input to the harbor (Figure 2). The inflow from these gulches – along with runoff, ocean input, and other natural sedimentation processes – supply sediment to Bodega Harbor. Because of the rather limited sediment supply, the Bodega Harbor federal navigation channels have a dredging cycle of 12–13 years (the main channel was constructed in 1943 and has been dredged only five times since).

The land adjacent to the project area comprises the flat shoreline plain surrounding Bodega Harbor, the rolling grass-covered hills north and east of the harbor, and the steep rocky peninsula on the west side of the harbor (Bodega Head). The University of California operates the Bodega Marine Laboratory on the Bodega Head peninsula. In the areas of natural slope and relief along the shoreline of the bay, there is little perceptible change in elevation from the land to the water interface. This gentle transitional zone has permitted a substantial amount of wetland, eelgrass, tidal mudflat, sand dune and coastal shoreline habitat to become established in the relatively undisturbed parts of the harbor. This is particularly true along the eastern two-thirds of the harbor.

The depth of Bodega Harbor is currently less than 2.5 feet MLLW in most areas outside of the federally maintained areas. According to a recent California Department of Fish and Wildlife (CDFW) eelgrass survey (CDFW 2010), much of the gently sloping harbor bottom (667.5 acres) is covered with eelgrass habitat (especially around the marina and to the north and east). In many places it grows along the edge of the federal channels.

The native coastal-strand, coastal-scrub, and salt-marsh vegetation is characteristic of the Bodega Bay area. Expanses of coastal-strand and wetland vegetation exist in the southeastern part of the bay and along the Doran Beach spit. Some areas of coastal scrub exist on the ocean side of Bodega Head; however, development is reducing the expanse of these habitats around the bay. Because of its coastal location, mild climate, quiet waters, extensive tidal flats and marsh areas, Bodega Bay supports a large variety of wildlife.

2.2 Sediment Quality

The USACE conducted sediment testing on Bodega Harbor sediment proposed for dredging in late 2015. The procedures for sediment sample collection, sample processing and preparation, physical and chemical analyses, biological testing, and data analysis were conducted in accordance with the approved Sampling and Analysis Plan (SAP) and the approved 2014 Master SAP. Sediment testing, consisting of appropriate physical, chemical, and biological tests, is required to determine if the dredged material is suitable for placement at SF-DODS or SF-8. The suitability requirements of sediment proposed for dredging and disposal is detailed in the USEPA's Green Book. Suitability for

placement at SF-DODS or SF-8 predominately occurs by comparing the results of tests conducted on the material to be dredged against the results of the same tests conducted on designated reference sediment.

Sediment sampled and tested during the 2015 sediment sampling and analysis effort was divided into five sample areas, designated BB1 through BB4, and SPC (for Spud Point Channel) (Figure 4). Sediment cores were collected following field protocols detailed in the SAP and Master SAP, and tests were conducted to determine the suitability for unconfined aquatic disposal (SUAD) at the SF-DODS and SF-8 disposal sites.

Table 2 and Table 3 summarize the test results for Bodega Harbor.

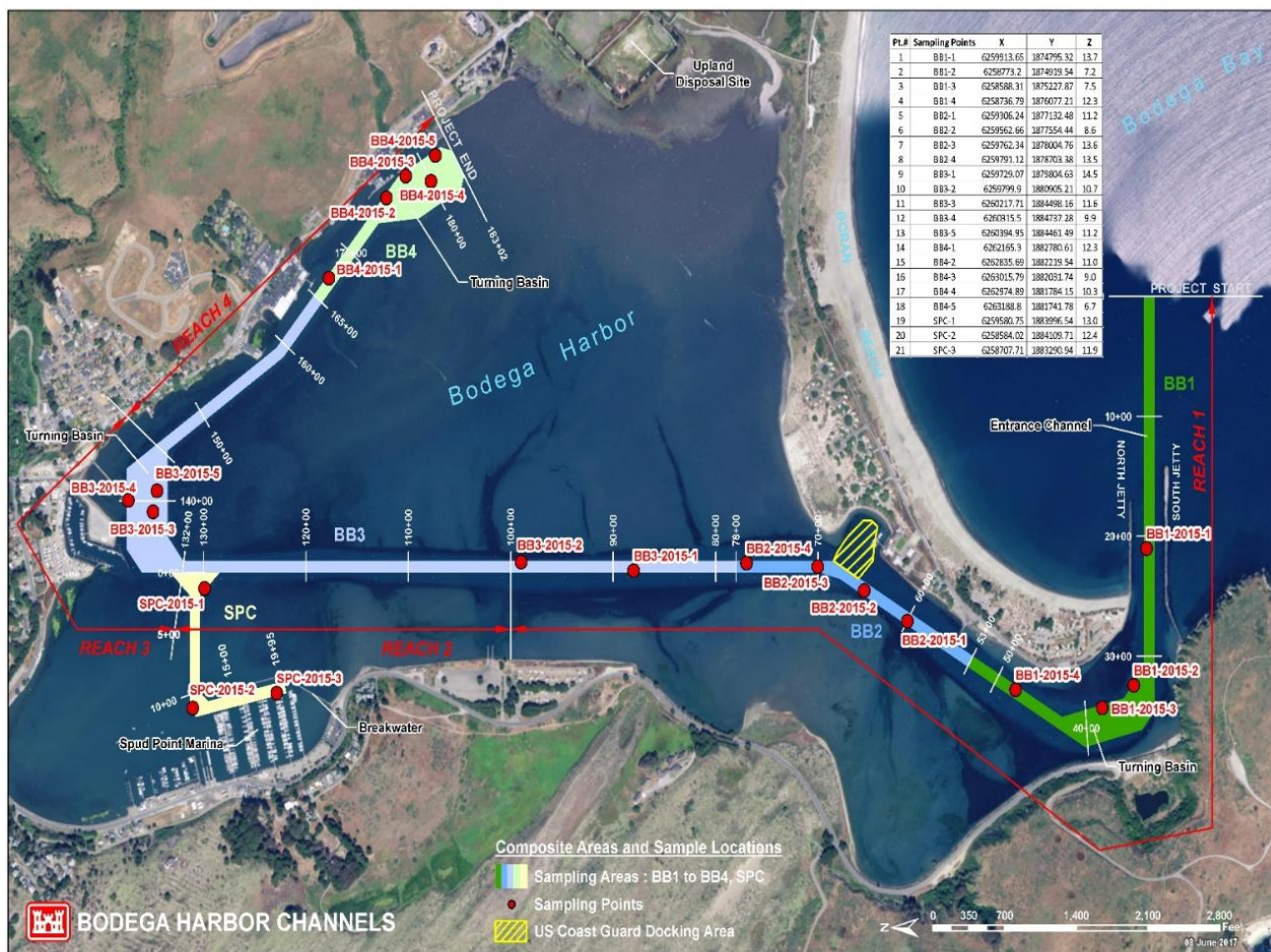


Figure 4: Bodega Harbor channel showing sample locations and composite areas.

Table 2: Bulk chemistry suitability.

Sample ID	Bulk Sediment Chemistry Exceedances			
	SF-DODS	Ecological Screening Levels		SFEI
		Salt ERL/Tel	Salt ERM/PEL	Bioaccumulation Trigger
BB3-2015	Arsenic, Cadmium, Total Butyltins, Total PAH	Nickel	Nickel	None
BB4-2015	TOC, Arsenic, Cadmium, Total Butyltins, Total PAH	Mercury, Nickel, Total DDT	Nickel	None
SPC-2015	TOC, Arsenic, Cadmium, Total Butyltins, Total PAH	Nickel	Nickel	None
**Samples BB1, BB2 were not analyzed because they consisted of greater than 80 percent sand.				

Table 3: Bioassay suitability.

Sample ID	Solid Phase	Water Column	Bioaccumulation	Suitability
BB3-2015	Pass	LPC Pass	Pass	SUAD
BB4-2015	Pass	LPC Pass	Pass	SUAD
SPC-2015	Pass	LPC Pass	Pass	SUAD
Notes:				
LPC = Limited Permissible Concentration				
SUAD = Suitable for Unconfined Aquatic Disposal				
**Samples BB1, BB2 were not analyzed because they consisted of greater than 80 percent sand.				

Although each of the samples analyzed had various analytes with concentrations above the SF-DODS database values, the benthic test results indicated that sediment disposal would not result in significant toxicity. Sediment elutriate test results indicated that disposal would not exceed the LPC, thus, the narrative water quality objectives were met. Based on these test results, all of the sediments would be considered SUAD at SF-DODS and at SF-8. Appendix D provides a summary of the project's sediment suitability determination as well as the sediment sampling and analysis report. Appendices (detailed data sheets) to the sediment sampling and analysis report are not

included in Appendix D, but are available upon request. Because the sediment met all criteria for placement at SF-DODS and SF-8, it is expected that potential impacts to sediment quality will be *less than significant*.

2.3 Water Quality

Dredging and dredged material placement has the potential to increase turbidity in the surrounding waters and release constituents of concern. During clamshell dredging, sediments may become suspended because of the bucket's impact with the channel bottom and material washing from the top and sides of the bucket as it is raised through the water column. Increased turbidity generated while pulling the bucket through the water column will be minimized with an environmental bucket. Sediments suspended in the water column could be carried with the current away from the dredge site, thus generating a turbidity plume in the area of dredging. These turbidity plumes are generally short-term, as suspended sediment eventually settles back on the bay floor. In addition, it is expected that approximately 3,000 cubic yards would be dredged per day, thus minimizing the potential for increased turbidity in Bodega Harbor. Furthermore, sediment sampling and testing has shown that the sediments proposed for dredging will not pose a significant risk to water quality through the release of constituents of concern (see Appendix D).

Placement of dredged material also has the potential to increase turbidity in and around dredged material placement sites. However, the project proposes to use open ocean aquatic placement sites in areas where the increased turbidity plumes would not be a significant concern in the surrounding waters.

Overall, the potential impacts to water quality at the dredging and placement sites are expected to be *less than significant*.

2.4 Biological Resources

This section provides a discussion of the existing biological resources in the project area that have the potential to be affected by the proposed action, including benthic resources, ESA protected species and critical habitat, EFH, and eelgrass.

2.4.1 Benthic Resources

Dredging has the potential to directly remove benthic organisms within the channel. Because the channel is rather shallow and dredging episodes only occur about every 12 years, it is expected that the benthic community within the channel is well established, yet disturbed. Recreation and fishing vessels continually traverse the navigation channel, thereby disturbing the channel regularly. Removal of benthic organisms would be permanent, as the organisms would be transported outside of the harbor, along with the sediment dredged. However, it is expected that the dredged surface would recolonize rather quickly by adjacent organisms, thus proving ecological function for fish that depend on benthic resources.

Aquatic sediment disposal has several likely environmental consequences, including the covering or smothering of benthic organisms, fish eggs, and larvae on the sea floor. Impacts of disposal on habitat loss are a function of the disposal site area and of the volume and quality of dumped sediment. This may lead to overall changes in the composition of biological communities and a dominance of tolerant species. Local benthic communities may colonize the covered area and result in a loss of habitat from encroachment.

Aquatic disposal can also adversely affect water column quality through increased turbidity. High suspended-sediment levels interfere with gill function, affecting the ability of fish gills to absorb dissolved oxygen. Also, turbidity can prevent the successful development of fish eggs and larvae, it may adversely affect filter feeders, and it reduces potential food supplies. Water-quality impacts are limited in both time and space. The duration of the disposal operation, sediment grain-size dynamics, water depth, and current velocity all influence the level of turbidity and magnitude of impact. After each disposal, the water column might be affected for a short period, but within ten to twenty minutes the cloud of turbidity from the dumped dredged material should dissipate.

Both SF-8 and SF-DODS are authorized to accept dredged material. The USEPA designated SF-DODS in 1994; additional information can be found at: <https://www3.epa.gov/region09/water/dredging/sfdods/>. Additional information regarding SF-8 can be found <https://www3.epa.gov/region09/water/dredging/sf-channel-bar/index.html>.

SF-DODS was located to minimize impacts to aquatic resources and, especially, to the nearby national marine sanctuaries. Its location optimally avoids critical habitats, important commercial and recreational fishery areas, and shipping lanes. The disposal site is located beyond the productive continental shelf, as far as possible from the national marine sanctuaries. It optimally avoids unique habitats, important commercial or recreational fishery areas, and shipping lanes. The ocean bottom, which is moderately sloping in this area, contains numerous gullies and canyons. The topography around the site creates a depositional environment – meaning that the spread of dredged material disposed there would tend to stay within the site’s boundaries. This facilitates benthic monitoring and implementing any changes in management practices that may be necessary over time. SF-8 accepts only clean sand, which, with the exception of benthic eggs, is not known to result in significant adverse impacts on benthic resources.

Following dredging and dredged material placement, it is expected that benthic resources would quickly recolonize and be available for species that depend on this habitat for forage and other ecological functions. As such, impacts to benthic resources is expected to be *less than significant*.

2.4.2 Threatened and Endangered Species

The USACE queried the USFWS’s Information for Planning and Consultation (IPaC) website to generate an official species list on June 17, 2016, and an updated list on April 13, 2017, just prior to finalizing this EA. The revised species list identified 13 species have the potential to be present in

the project area. Critical habitat was not identified in the project area. The USACE also requested an official species list from NMFS on July 7, 2016. The species list included three fishes and two species' designated critical habitat. The updated species list is provided in Appendix A.

Table 4 provides an overview of the species and critical habitat identified in the updated species list and whether these species have the potential to be affected by the proposed action. Species identified in Table 4 do not have the potential to be affected by the proposed action are not considered further in this EA. Species that may be affected by the proposed action are discussed in herein.

Table 4: Summary of ESA listed species, designated critical habitat, and impacts assessment

Common Name	Scientific Name	Federal Status	Potential to be Affected by Proposed Action
AMPHIBIANS			
California red-legged frog	<i>Rana draytonii</i>	Threatened	<i>No effect.</i> Does not utilize waters of Bodega Harbor
BIRDS			
Marbled murrelet	<i>Brachyramphus marmoratus</i>	Threatened	<i>No effect.</i> Uncommon winter resident in action area.
Northern spotted owl	<i>Strix occidentalis courina</i>	Threatened	<i>No effect.</i> Inhabits old growth forests, which are not present in the action area.
Short-tailed albatross	<i>Diomedea albatrus</i>	Endangered	<i>No effect.</i> Rare in California and not known to nest in the United States.
Western snowy plover	<i>Charadrius alexandrinus nivosus</i>	Threatened	<i>No effect.</i> Present on beaches adjacent to the harbor; however, these areas will not be affected by the proposed action.
Yellow-billed cuckoo	<i>Coccyzus americanus occidentalis</i>	Threatened	<i>No effect.</i> Inhabits wooded areas with dense cover that is not present in the action area.
CRUSTACEANS			
California freshwater shrimp	<i>Syncaris pacifica</i>	Endangered	<i>No.</i> Does not inhabit marine waters.

Common Name	Scientific Name	Federal Status	Potential to be Affected by Proposed Action
FISH			
Central California Coast Coho salmon	<i>Oncorhynchus kisutch</i>	Endangered	Less than significant
Green sturgeon	<i>Acipenser medirostris</i>	Threatened	Less than significant
Central California Coast Steelhead	<i>Oncorhynchus mykiss</i>	Threatened	Less than significant
Tidewater goby	<i>Eucyclogobius newberryi</i>	Endangered	Less than significant
FLOWERING PLANTS			
Clover lupine	<i>Lupinus tidestromii</i>	Endangered	<i>No effect.</i> Inhabits upland areas outside of the action area.
Yellow larkspur	<i>Delphinium luteum</i>	Endangered	<i>No effect.</i> Inhabits upland areas outside of the action area.
INSECTS			
Myrtle's Silverspot butterfly	<i>Speyeria zerene myrtleae</i>	Endangered	<i>No effect.</i> Inhabits upland areas outside of the action area.
San Bruno elfin butterfly	<i>Incisalia mossii bayensis</i>	Endangered	<i>No effect.</i> Inhabits upland areas outside of the action area.
CRITICAL HABITAT			
Green sturgeon	n/a	Designated	Less than significant
Coho salmon	n/a	Designated	<i>No effect.</i> Critical habitat spawning streams located in tributaries to Bodega Bay proper, outside of the action area.

2.4.3 Central California Coast Coho Salmon (*Oncorhynchus kisutch*) and Coho Salmon Critical Habitat

Coho Salmon: NMFS has listed the Central California Coastal ESU coho salmon as a threatened species (62 Fed. Reg. 24588, May 6, 1997). Historically, this species probably inhabited most coastal streams in Washington, Oregon, and Central and Northern California. Because of dams, water diversions, and other artificial changes to California's coastal streams, however, this species has been declining dramatically.

All of the streams that terminate in Bodega Harbor are intermittent, which means there are no ideal streams for spawning and consequently no coho salmon runs. Furthermore, the dredging, planned for late spring or summer, is scheduled to occur before peak migration (early November), when few, if any, coho will be found in the Harbor. Therefore, impacts are expected to be *less than significant*, should in the unlikely event that coho be present in the transportation corridor or dredged material placement sites.

Coho Salmon Critical Habitat: Critical habitat for the Central California Coast coho salmon encompasses accessible reaches of all rivers (including estuarine areas and tributaries) between Punta Gorda in Humboldt County and the San Lorenzo River (inclusive), Santa Cruz County, California, including two streams entering San Francisco Bay: Arroyo Corte Madera Del Presidio and Corte Madera Creek. Critical habitat consists of the water, the substrate, and adjacent riparian zone of estuarine and riverine reaches (including off-channel habitats) in hydrologic units and counties identified in the designation (64 Fed. Reg. 24049, May 5, 1999).

Accessible reaches are those within the historical range of the ESU that can still be occupied by any life stage of coho salmon. The designation at 64 Fed. Reg. 24049 does not specifically identify critical habitat in the project area beyond indicating that accessible reaches of rivers in the Bodega Bay Hydrological Unit are included as critical habitat. USACE assumes waterways that are accessible to steelhead would also be accessible to coho as well, particularly if coho spawning grounds are present. USACE consulted NOAA Fisheries GIS data for steelhead critical habitat; the GIS data indicates that Estero Americano, a tributary to Bodega Bay proper, is critical habitat for this species (Figure 4). No other waterways in vicinity of the project area are accessible to salmonids.

Because dredging and dredged material transportation would not occur within coho salmonid critical habitat, the proposed maintenance dredging will not affect this species' critical habitat.

2.4.4 Steelhead Trout (*Oncorhynchus mykiss*)

NMFS has listed the Central California Coast DPS steelhead trout as a threatened species (71 Fed. Reg. 834, January 5, 2006). Its range includes Bodega Bay, an area listed as critical habitat (Figure 5).



Figure 5: Steelhead trout and green sturgeon areas of critical habitat.

Steelhead exhibit a varying degree of anadromy between subpopulations, and these different subpopulations may spawn at different times during the year. Steelhead typically spend two years in the ocean before returning to freshwater to spawn. Mature steelhead (particularly the summer-spawning populations) may enter freshwater a year before spawning, and unlike coho salmon, they may spawn more than once.

All of the streams that terminate in Bodega Harbor are intermittent (Figure 2), which means there are no ideal streams for spawning and consequently no steelhead runs. Furthermore, the dredging, planned for summer or early fall (2017), will occur during a time of the year when

steelhead are not likely to be found in the Harbor. Therefore, impacts are expected to be *less than significant*, should migrating steelhead be present along the transportation corridor or dredged material placement sites.

2.4.5 Green Sturgeon (*Acipenser medirostris*) and Green Sturgeon Critical Habitat

Green Sturgeon: Green sturgeon southern distinct population segment (DPS) utilize coastal estuaries and nearshore waters along the West Coast of North America, ranging from Mexico to the Bering Sea. Although they inhabit waters along the coast of North America, they have a general tendency to head north after their out-migration from freshwater (Lindley *et al.* 2011). Adult southern DPS green sturgeon spawn in the Sacramento River watershed during the spring and early summer months (Moyle *et al.* 1995). Juveniles rear in the Sacramento-San Joaquin Delta and San Francisco Estuary for a few years before entering the ocean as sub-adults. In ocean waters, green sturgeon inhabit waters between 0 and 650 feet (200 meters) deep, but are typically found in depths from 65-260 feet (20-80 meters) (Huff *et al.* 2011). Multiple rivers and estuaries are visited by aggregations of adult and sub-adult green sturgeon in summer months, and larger estuaries appear to be particularly important habitat (Lindley *et al.* 2011). During winter months, green sturgeon generally reside in the coastal ocean, particularly off the coasts of western Canada and Washington State.

Dredging the entrance channel and transporting dredged material has the potential to affect green sturgeon. However, dredging the entrance channel would be conducted over only a few days, thus resulting in temporary impacts to sturgeon that may be present near dredging activity. Even so, it is expected that sturgeon would avoid the dredge. Transportation of dredged material could also affect sturgeon migrating in coastal waters along the transportation corridor. It is not likely, however, that sturgeon would be present in the uppermost 10 feet (three meters) of the water column, because they typically inhabit waters 65 feet (20 meters) or more deep. As such, impacts are expected to be *less than significant*, should they occur.

Green Sturgeon Critical Habitat: The critical habitat designated for the southern DPS green sturgeon includes coastal marine waters within 60 fathoms depth from Monterey Bay, California to Cape Flattery, Washington State, including the Strait of Juan de Fuca to its United States boundary, and includes Bodega Bay proper, but not the harbor. 74 Fed. Reg. 52300, October 9, 2009. Project areas located in green sturgeon critical habitat include approximately 1,600 linear feet (3.7 acres) of the Bodega Bay harbor entrance channel (Figure 4), as well as the dredged material transportation corridors to SF-DODS and SF-8.

Primary constituent elements (PCEs) of designated critical habitat in estuarine areas are food resources, water flow, water quality, mitigation corridor, depth, and sediment quality. In freshwater riverine systems, PCEs include food resources, substrate type or size, water flow, water quality, migratory corridor, depth, and sediment quality. PCEs in the nearshore coastal marine areas include migratory corridor, water quality, and food resources. The proposed maintenance dredging project is not located within the estuarine or freshwater riverine PCEs; however, the entrance channel and

transportation corridor are within the nearshore coastal marine PCEs. The dredged-material disposal sites (SF-DODS and SF-8) are also within green sturgeon critical habitat; however, dredged material disposal of suitable material is already permitted for these sites.

Current hydrosurvey data indicate that a small portion (0.9 acre) of the entrance channel, which is in green sturgeon critical habitat has shoaled above the projects authorized depth (12 feet MLLW). It is anticipated that additional shoaling may have occurred since this hydrosurvey was conducted. Should portions of the entrance channel be above the authorized depth, maintenance dredging would be required to maintain safe navigation. Hydrosurveys conducted prior to dredging will confirm the locations where dredging will occur and the associated volume of dredged material. It is expected that dredging the entrance channel would be minimal, lasting only a few days during the dredging period. Dredging could temporarily affect PCEs in the entrance channel; however, these impacts would be temporary, minimal, and not adversely modify green sturgeon critical habitat. Transporting dredged material from the federal channels to the disposal sites likewise would not affect green sturgeon critical habitat. Therefore, impacts are expected to be *less than significant*, limited to minor, temporary impacts in the area of critical habitat where dredging may occur.

2.4.6 Tidewater Goby (*Eucyclogobius newberryi*)

The tidewater is a small fish that inhabits coastal lagoons and bays from Del Norte County in Northern California to San Diego County in Southern California. Tidewater gobies are unique because they apparently lack a true marine phase in their life history. This apparent absence of a marine phase, signifying an affinity for very low salinity water, may account for their discontinuous distribution along the California coast. The tidewater goby has been proposed for listing as endangered (57 Fed. Reg. 58770, December 11, 1992).

Because there have been no reported catches of the tidewater goby within Bodega Harbor, it can be inferred that the species is absent from Bodega Harbor and impacts are expected to be *less than significant*, should this species be present in the near-shore areas of the harbor.

2.4.7 Essential Fish Habitat

The MSA protects the EFH of species fished for commercial fishery purposes. The project area is located within coastal waters identified as EFH for various life stages of fishes managed under the following Fishery Management Plans (FMP):

- Pacific Groundfish FMP (NMFS 1994);
- Pacific Coast Salmon FMP (NMFS 1997);
- Coastal Pelagics FMP (NMFS 1998)

In addition to FMPs, the MSA requires NOAA-fisheries to designate a habitat area of particular concern (HAPC) for each species. HAPC are subsets of EFH, which are rare, particularly susceptible to human-induced degradation, ecologically important or located in an environmentally stressed

area. HAPCs are not afforded additional protection beyond that of the EFH; however, federal projects with potential adverse impacts to HAPCs will be given more scrutiny during the consultation process. Bodega Harbor has extensive eelgrass, which is considered an HAPC under the Pacific Groundfish FMP and Pacific Salmon FMP.

2.4.7.1 Pacific Groundfish FMP

The Pacific Groundfish FMP consists of essential fish habitat for over 82 species of fish that typically live on or near the bottom of the ocean. Because groundfish species are widely dispersed during certain life stages, EFH for groundfish species is correspondingly large. As such, EFH for Pacific Coast Groundfish includes the entire exclusive economic zone (EEZ) and all the waters from the mean higher high water line (MHHW) to the upriver extent of saltwater intrusion in river mouths along the coasts of Washington, Oregon and California, seaward to the boundary of the United States' EEZ. The Pacific Coast Groundfish FMP describes seven composite units that comprise Pacific groundfish EFH: estuarine, rocky shelf, non-rocky shelf, canyon, continental slope and basin, neritic zone, and oceanic zone.

The overall extent of groundfish EFH includes:

- (1) All water and substrate in depths that are less than or equal to 11,483 feet (3,500 meters or 1,914 fathoms) to MHHW or the upriver extent of saltwater intrusion (upstream area and landward where waters have salinities less than 0.5 parts per thousand);
- (2) Seamounts in depths greater than 11,483 feet; and
- (3) Areas designated as habitat area of particular concern (HAPC) (for Pacific groundfish, HAPCs include estuary, seagrass, kelp canopy and rocky).

Dredging activities could affect Pacific groundfish EFH. Removal of sediment could result a temporarily increase turbidity levels in Pacific groundfish EFH; however, these impacts would be minimized by the use of an environmental bucket. Dredging would also directly remove benthic resources, which is prey for many groundfish species. Removal of benthic resources is discussed in Section 2.4.1. Should individuals be present in the channel while dredging is occurring, individuals could be entrained or come into contact with dredge equipment. Entrainment and other direct contact with dredge equipment could result in death or injury to individuals. Finally, dredging has the potential to affect eelgrass HAPC in Bodega Harbor through direct removal and increased turbidity; however, USACE proposes to avoid and minimize impacts to eelgrass with an environmental bucket to reduce turbidity. In addition, pre- and post- eelgrass surveys are proposed to quantify any impacts to eelgrass HAPC. Section 2.4.8 provides details of potential impacts to eelgrass, avoidance and mitigation measures, and eelgrass surveys. With the exception of currently unknown impacts to eelgrass, potential effects to Pacific Groundfish EFH are expected to be *less than significant*. As summarized in Section 2.4.8 (and detailed in the EFH Assessment for this

project), impacts to eelgrass will be evaluated and quantified through pre- and post-eelgrass surveys.

2.4.7.2 Pacific Coast Salmon FMP

Bodega Harbor and the transportation corridor is considered EFH for Pacific groundfish. Several groundfish species may be present in the project area, such as rockfish (55 species), starry flounder, leopard shark, and lingcod. In addition, eelgrass (*Zostera marina*), a Pacific Groundfish FMP HAPC, are rather extensive in Bodega Harbor in the shallow sandy areas and adjacent to the federal navigation channel. Eelgrass HAPC is further described below. Dredging the federal navigation channel in Bodega Harbor may affect Pacific groundfish EFH, particularly eelgrass (described below). As discussed in Section 2.4.8, USACE proposes to conduct pre and post-dredging eelgrass surveys to determine whether eelgrass is affected, and if so, to what extent. In addition, Section 2.4.8 provides avoidance and minimization measures are proposed to reduce the potential impacts to eelgrass.

The Pacific Salmon FMP consists of EFH for coho, Chinook, and Puget Sound pink salmon. Pacific salmon EFH is defined as: waters and substrate necessary for salmon product needed to support a long-term sustainable salmon fishery and salmon contributions to a healthy ecosystem. This EFH includes: streams, lakes, ponds, wetlands, and other currently viable water bodies and most of the habitat historically accessible to salmon in Washington, Oregon, Idaho, and California. In estuarine and marine areas, salmon EFH extends from the nearshore and tidal submerged environments with state territorial waters out to the full extent of the EEZ.

Chinook and coho are anadromous species that pass through the Sacramento River drainage to the California coastline. Chinook juveniles are ocean dwelling and occur primarily over continental shelf waters. Adult Chinook salmon spend most of the marine portion of their life cycle off the California coast and, therefore, may be found off the coastline near Bodega Harbor. Coho spend approximately the first half of their life cycle rearing and feeding in streams and small freshwater tributaries. Spawning habitat is small streams with stable gravel substrates. The remainder of the life cycle is spent foraging in estuarine and marine waters of the Pacific Ocean.

Because there is high boat traffic in the federal navigation channels, none of these fish would be affected by the maintenance dredging. Although new information suggests that leopard sharks may be found within the federal channels at low tide, the amount of dredging occurring per day will be minimal and not rise to the level of significant for these highly mobile species. Similarly, it is expected that impacts to salmonids would be less than significant, since the project is located well away from known spawning habitat, and these fish are highly mobile and, therefore, able to avoid dredging activities within Bodega Harbor.

Both the federal navigation channels and transportation corridor are within the nearshore Pacific salmon EFH. In addition, eelgrass in the harbor is considered HPAC for Pacific salmon EFH. Because accessible rivers suitable for spawning do not flow into Bodega Harbor, it is unlikely that

salmonids would utilize the eelgrass habitat within the harbor. The transportation corridor is also within salmonid nearshore EFH. Transportation of dredged material from the dredging site to the ocean disposal sites may temporarily affect the surface waters of Pacific salmon EFH. The impacts to Pacific Salmonid FMP are expected to be *less than significant*.

2.4.7.3 Coastal Pelagics FMP

The Coastal Pelagics FMP delineates EFH for five fish species: Pacific sardine, Pacific (chub or blue) mackerel, northern anchovy, jack mackerel, and market squid (invertebrate). Coastal pelagic fishes live in the water column, anywhere from the surface to a depth of 3300 feet (1000 meters), and in waters with temperatures ranging between 10 to 26 degrees Celsius (°C). The species are not associated with the substrate. Generally, they occur above the thermocline in the upper mixed layer. The EFH for coastal pelagic fishes and market squid is defined as all marine and estuarine waters from the shoreline along the coasts of California, Oregon, and Washington offshore to the limits of the EEZ and above the thermocline, south to the United States–Mexico maritime boundary. Generally, sea-surface temperatures and habitat boundaries for coastal pelagic finfish extend farther to the north during summer than during winter months. The project area, including SF-DODS and SF-8, is within EFH for coastal pelagic species.

The proposed action has the potential to affect Coastal Pelagic EFH in the project area. But it is expected that impacts would be temporary and not rise to the level of substantial. Dredging the federal channels would result in a small physical structure being present in the EFH; however, impacts typically associated with mechanical dredging, such as turbidity, would be greatly reduced with the use of an environmental clamshell bucket. Transportation of dredged material could temporarily affect the surface of the water column in a small area, but this impact would be minimal and considered *less than significant*.

2.4.8 Habitat Area of Particular Concern

Eelgrass can form extensive meadows in soft-bottom habitats in waters with depths ranging from intertidal to 20 feet (6 meters) (CDFW 2008), and even deeper waters in Southern California (CDFW 2008; Engle and Miller 2005). Nonetheless, NOAA Fisheries' 2014 California Eelgrass Mitigation Policy and Implementation Guidelines states, "[i]n general, eelgrass does not extend deeper than 12 feet mean lower low water (MLLW) in most protected bays and harbors in Southern California and is more limited in Central and Northern California embayments. However, eelgrass can grow much deeper in entrance channels and offshore."

Many parameters limit the where eelgrass grows, particularly regarding the depth which it can grow. Temperature, salinity, and light availability are important factors that limit eelgrass growth (Thom *et al.* 2008; CDFW 2008). Optimal temperatures for eelgrass ranges from approximately 10 to 20 °C, but can survive in temperatures as low as -6 °C and as high as 40.5 °C (CDFW 2008). Eelgrass typically prefers salinities (Thom *et al.* 2008). Thom *et al.* (2008) showed that eelgrass in Pacific Northwest embayments required instantaneous and long-term light requirements for growth and sustainment. Light availability is especially important during the wrong time of year,

and even short-term reductions in light during this time can result in reduced eelgrass density and biomass (Thom *et al.* 2008). During times of the year when eelgrass growth is predominately from stored carbon, light availability may not be as important of a resource, compared to the growing season. Factors that can affect light availability include depth of light penetration, suspended sediment, turbidity, and other factors that shade suitable waters (CDFW 2008; Thom *et al.* 2008; NOAA Fisheries 2014).

The most recent eelgrass survey was conducted by the CDFW in 2010 during which digitized aerial imagery was compiled (CDFW 2010). According to the survey data, approximately 667.5 acres of eelgrass habitat are present in Bodega Harbor. Figure 6 provides an overview of the 2010 mapped eelgrass and the federal navigation channel boundaries. Figure 7 shows the 5-meter eelgrass distribution band around eelgrass, as defined in the National Oceanic and Atmospheric Administration Fisheries' *California Eelgrass Mitigation Policy and Implementing Guidelines* (NOAA Fisheries 2014), and defined below.

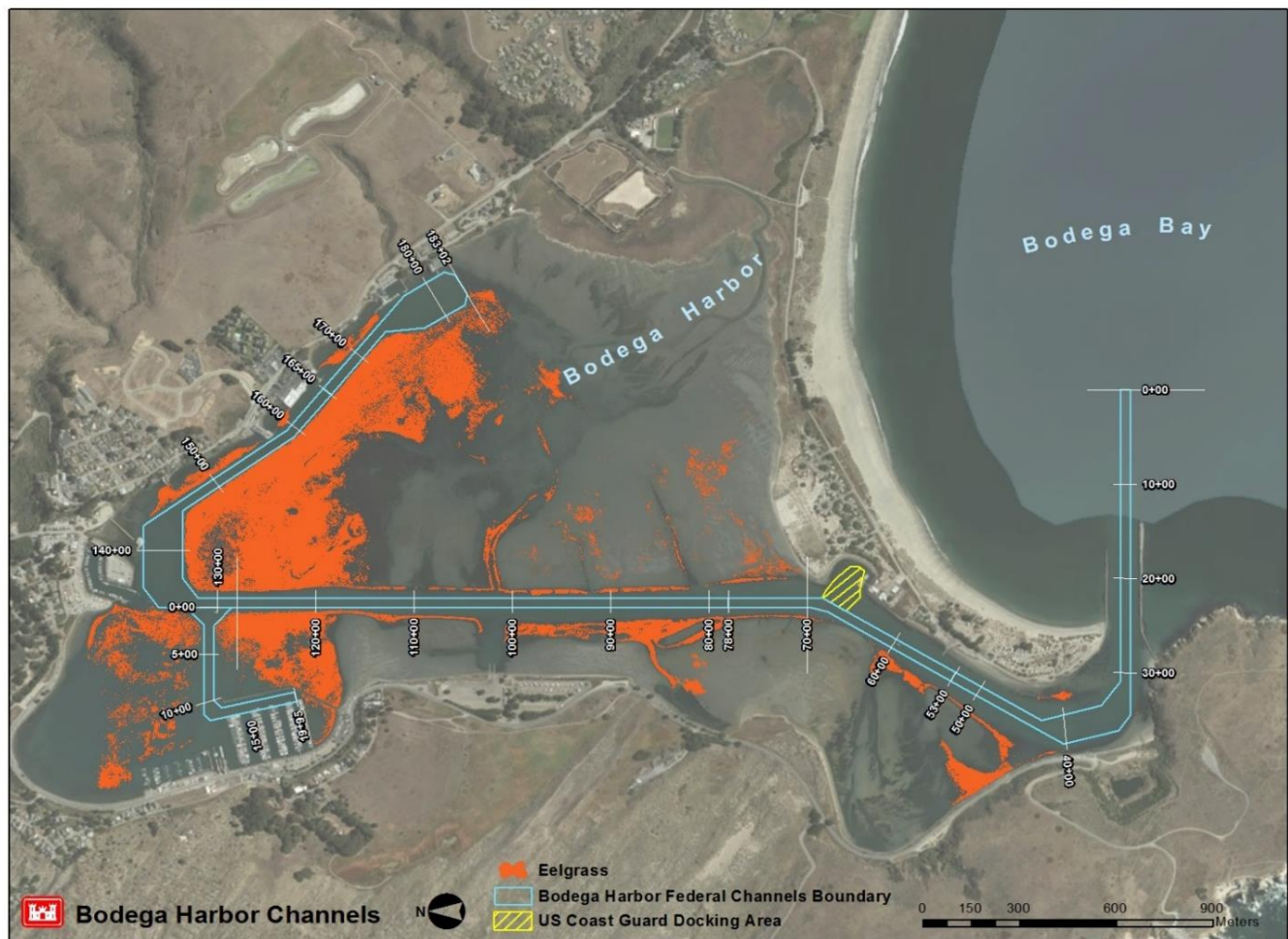


Figure 6: 2010 Bodega Harbor eelgrass survey (CDFW 2010).

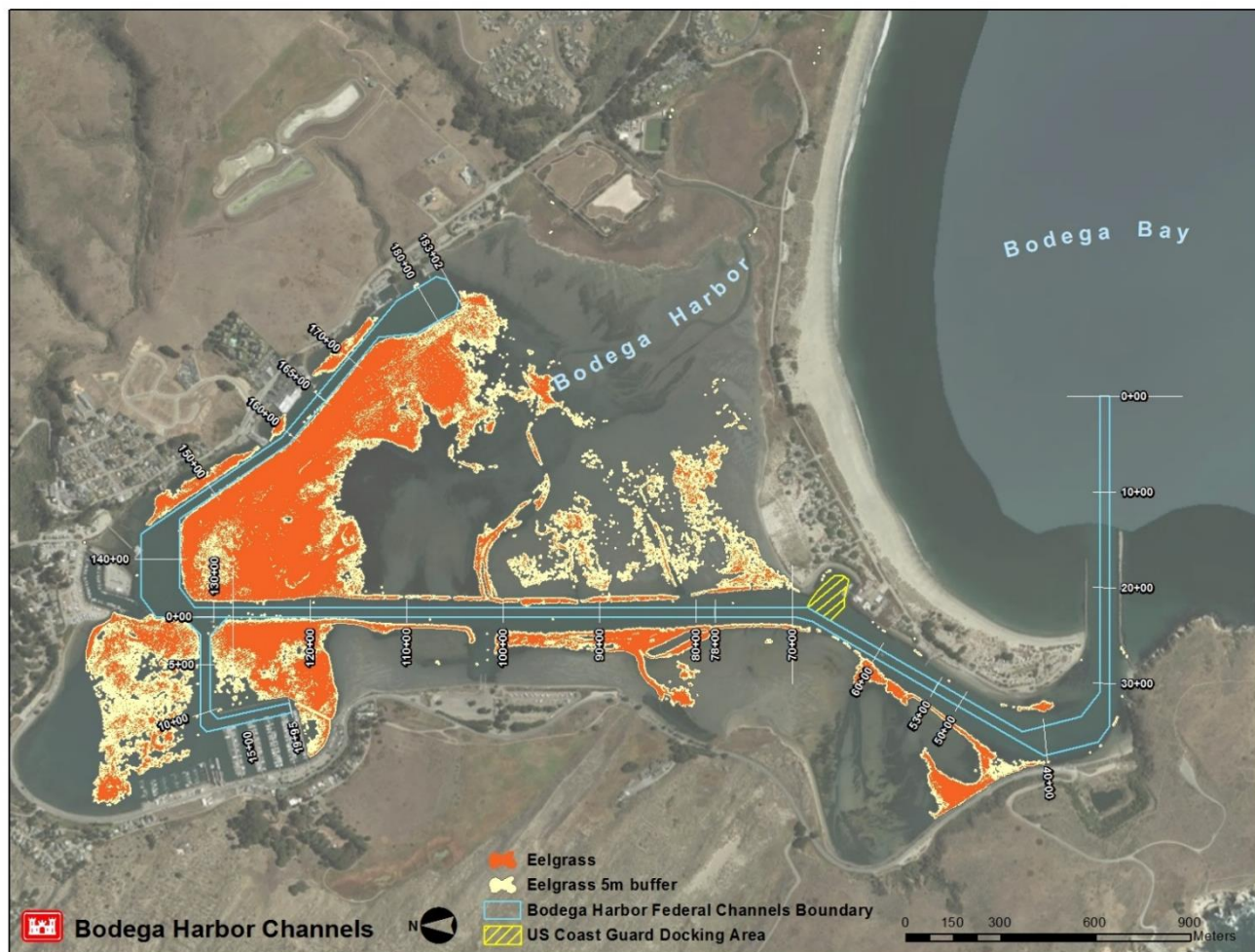


Figure 7: 2010 Bodega Harbor eelgrass survey with 5-meter buffer (CDFW 2010).

Eelgrass distribution (as defined in NOAA Fisheries 2014): To encompass fluctuating eelgrass distribution and functional influence around eelgrass cover, eelgrass habitat is defined as areas of vegetated eelgrass cover – any eelgrass within one square meter of another shoot – bounded by a five-meter perimeter of unvegetated area. The five-meter perimeter may have eelgrass shoots that are not within one meter of another shoot and may be either within eelgrass vegetation (i.e., surrounded by eelgrass) or outside vegetation (i.e., around the perimeter of eelgrass). Eelgrass distribution does not include environmentally unsuitable areas, such as hard substrates, shaded locations, or areas too deep to support eelgrass.

The proposed maintenance dredging has the potential to directly remove eelgrass that may be present in the navigation channel and increase turbidity around eelgrass adjacent to the channel. The USACE proposes to use an environmental bucket mechanical dredge to reduce turbidity generated from dredging. Environmental buckets are typically used to dredge sediments with elevated levels of constituents of concern because they greatly limit the amount of sediment that is resuspended in the water column. Although the sediment proposed for dredging is clean material

suitable for open ocean disposal, the USACE proposes to dredge the federal channel with an environmental bucket to reduce the potential for resuspended sediments and associated turbidity to substantially affect adjacent eelgrass beds. Potential effects, minimization and avoidance measures, and the effects determination are provided below.

Direct removal: Direct removal of eelgrass may occur should eelgrass be removed by dredging equipment. Direct removal will be documented by pre- and post-surveys (discussed in Appendix B). The USACE will conduct pre-dredge surveys prior to dredging to document locations of eelgrass within the dredging footprint. To the extent practicable, USACE will avoid areas of eelgrass. Areas where eelgrass cannot be avoided will be clearly identified in pre-dredge surveys. To the extent practicable, the USACE will remove and transplant eelgrass that would otherwise be removed during dredging. Post-dredge surveys, if required, will identify areas where eelgrass was directly removed.

Turbidity: Effects of turbidity will be reduced through use of environmental bucket and in-water work will be conducted as quickly as possible. Further, to the extent practicable, the USACE will schedule dredging closest to eelgrass beds during low, outgoing tides to minimize turbidity in eelgrass.

Shading: to the extent practicable, position scows and other dredging equipment such that eelgrass is not shaded, or is only temporarily shaded; work in areas where eelgrass is not present during peak hours of sunlight; and, further limit dredging activities by tide or day/night, to the extent practicable.

As discussed, it is expected that most effects on eelgrass could be avoided and minimized through avoidance of direct removal and the use of an environmental bucket dredge and scheduling dredging near eelgrass such that impacts are avoided. However, direct removal of eelgrass may adversely affect Pacific groundfish and Pacific salmonid EFH, which eelgrass is a component of. USACE proposes to conduct eelgrass surveys before and after dredging per the requirements of the *California Eelgrass Mitigation Policy and Implementing Guidelines* (NOAA Fisheries 2014). Eelgrass surveys will determine the distribution of eelgrass and will determine the impact of the maintenance dredging on eelgrass in Bodega Harbor. USACE has prepared an EFH Assessment that details the range of potential impacts the proposed action may have on eelgrass and avoidance and minimization measures to reduce these potential impacts. Avoidance and minimization measures are summarized below.

In addition, an eelgrass monitoring plan was prepared detailing the pre- and post-dredge eelgrass surveys that will be conducted to quantify potential impacts to eelgrass HAPC. The monitoring plan was prepared in accordance with the *California Eelgrass Mitigation Policy and Implementing Guidelines* (NOAA Fisheries 2014). The USACE recently completed ESA informal consultation and EFH abbreviated consultation with NMFS pursuant to the MSA ESA consultation regulations. A copy of NMFS' letter of concurrence, dated July 5, 2017, can be found at the end of

Appendix B. The USACE currently believes that avoidance and minimization measures will ensure that potential effects to eelgrass are *less than significant*.

2.5 Noise

The use of dredging equipment within Bodega Harbor is likely to create a temporary noise disturbance to all species in the immediate vicinity of the harbor. The disturbance that is created from this project will be insignificant compared to the routine, day-to-day noise generated by regular boating and shipping activities throughout the bay and harbor. Moreover, any impacts from noise will be limited to the duration of the dredging, which will be short. Consequently, maintenance dredging of Bodega Harbor will have a *less than significant* effect on the noise level.

2.6 Cumulative Impacts

No cumulative impacts from dredging Bodega Harbor or from the aquatic disposal are anticipated. The maintenance program is small and infrequent, involving about 110,000 cubic yards of sediment about every 12 or 13 years. This amount of dredged material is slight when compared to the maximum annual capacity for SF-DODS or SF-8. Moreover, placement at SF-8 potentially has beneficial impacts, as the sand is being kept in the nearshore zone, which is a beneficial-use area. The adverse environmental impacts from dredging are either *de minimis* or are temporary and tend to dissipate quickly over time. Therefore, the cumulative impacts from dredging Bodega Harbor and aquatic disposal are less than significant.

Other than the Harbor District dredging the local marina, there are no other known dredging projects planned for the immediate or distant future that are located within or around Bodega Harbor.

3.0 Comments on the Draft Environmental Assessment

The draft EA was circulated for a 30-day public and agency review from April 19 – May 18, 2017. A total of five comments letters or emails were received during the comment period. The comment letters are included in Appendix E, along with the USACE's response. Where applicable, this final EA was updated to reflect responses. Commenters are listed below.

- United States Environmental Protection Agency
- California Department of Fish and Wildlife
- North Coast Regional Water Quality Control Board
- Greater Farallones National Marine Sanctuary
- Federated Indians of Graton Rancheria

4.0 Interested Parties

The USACE coordinated with the following federal, state, and local agencies, as well as other non-governmental stakeholders:

FEDERAL AGENCIES

- NOAA - Gulf of the Farallones National Marine Sanctuary
- National Marine Fisheries Service
- United States Coast Guard
- United States Environmental Protection Agency, Region 9
- United States Fish and Wildlife Service

STATE AGENCIES

- California Coastal Commission
- California Department of Fish and Wildlife
- California State Historic Preservation Office
- North Coast Regional Water Quality Control Board
- San Francisco Bay Area Regional Water Quality Control Board

LOCAL AGENCIES

- Northern Sonoma County Air Pollution Control District

NATIVE AMERICAN TRIBES

- Federated Tribes of Graton Rancheria

NON-GOVERNMENTAL STAKEHOLDERS

- Bodega Marine Laboratory, UC Davis

5.0 Conclusion

Based on the information obtained during preparation of this EA, it is anticipated that the proposed action will not have a significant impact on the quality of the human environment.

Factors considered in this analysis were sediment quality, water quality, and biological resources (including ESA and EFH-protected species). Consequently, preparation of an Environmental Impact Statement is not required.

6.0 Literature Cited

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