DRAFT Environmental Assessment

2019 Crescent City Harbor Federal Channels Maintenance Dredging

April 2019

US Army Corps of Engineers ®
San Francisco District

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Glossary

AB	Assembly Bill
AEP	Archeological Evaluation Plan
APCD	Air Pollution Control Districts
APE	Area of Potential Effects
AQMD	Air Quality Management Districts
BA	Biological Assessment
BMPs	best management practices
CAA	Clean Air Act
CAAQS	California Ambient Air Quality Standards
CARB	California Air Resources Board
CCC	California Coastal Commission
CDFW	California Department of Fish and Wildlife
CESA	California State Endangered Species Act
CEQ	Council on Environmental Quality
CEQA	California Environmental Quality Act
CFR	Code of Federal Regulations
CH_4	methane
CO	carbon monoxide
CO_2	carbon dioxide
CRHP	California Register of Historic Places
CWA	Clean Water Act
cy	cubic yard
DMMP	Dredged Material Management Plan
DNSWMA	Del Norte Solid Waste Management Authority
DPM	diesel particulate matter
DTSC	California Department of Toxic Substances Control
EA	Environmental Assessment
EFH	essential fish habitat
EIS	Environmental Impact Statement
EO	Executive Order
ESA	Endangered Species Act
FMP	Fishery Management Plan
GHGs	greenhouse gases
HAPC	Habitat Areas of Particular Concern
HOODS	Humboldt Open Ocean Disposal Site
MBTA	Migratory Bird Treaty Act
MET	modified elutriate testing
MLLW	mean lower low water
MM-CR-XX	mitigation measure for cultural resources
MM-TE-XX	mitigation measure for threatened & endangered species
MMPA	Marine Mammal Protection Act
MPAs	Marine Protected Areas

MPRSA	Marine Protection, Research, and Sanctuaries Act
NAAQS	National Ambient Air Quality Standards
NCUAQMD	North Coast Unified Air Quality Management District
NEPA	National Environmental Policy Act
NMFS	National Marine Fisheries Service
NHPA	National Historic Preservation Act
N_2O	nitrous oxide
NO_2	nitrogen dioxide
NRHP	National Register of Historic Places
NWI	National Wetlands Inventory
O&M	Operations and Maintenance
O_3	ozone
ODEQ	Oregon Department of Environmental Quality
Pb	lead
PM	particulate matter
RWQCB	Regional Water Quality Control Board
NCRWQCB	North Coast Regional Water Quality Control Board
SHPO	State Historic Preservation Office
SIP	State Implementation Plan
SMMP	Site Management and Monitoring Plan
SPCC	Spill Prevention, Control, and Countermeasures
SO_2	sulfur dioxide
TOC	total organic carbon
USACE	U.S. Army Corps of Engineers
USCG	U.S. Coast Guard
USEPA	U.S. Environmental Protection Agency
USFWS	U.S. Fish and Wildlife Service
yr	year

1 Introduction

1.1 Purpose and Need

The National Environmental Policy Act (NEPA) requires that an Environmental Assessment (EA) contain a statement of purpose and need (40 Code of Federal Regulations [C.F.R.] § 1502.13). The need is the broad underlying necessity or requirement to which the NEPA lead agency is responding. Statements of purpose and need are intended to be comprehensive enough to adequately encompass the need, and specific enough to guide the development of alternatives.

Over time, shoaling of the federal Crescent City Harbor Channels results in reduced depths that limit navigation, especially for larger commercial vessels. The purpose of this project is to perform maintenance dredging to provide for the need of continued safe and reliable commercial and recreational navigation.

1.2 Background

A Dredged Material Management Plan (DMMP) was prepared for Crescent City Harbor in 2015 (HydroPlan and Anchor QEA 2015). The purpose of the DMMP was to evaluate alternatives and recommend a plan for management of dredged material for the next 20 years or more of maintenance dredging. No placement sites that are permitted, have adequate capacity, and are suitable were identified; where suitability refers to sediment chemistry and grain size restrictions. It was recommended that the process for designation of a new placement site be undertaken. However, such a process will take more than four years and cannot not be completed in time for the next scheduled maintenance dredging episode.

The DMMP evaluated near-term options that could be implemented for the next maintenance dredging episode. This EA provides an environmental evaluation of the potential impacts of maintenance dredging for the 2019 episode.

1.3 Project Area

Crescent City Harbor is a small commercial harbor located on the Northern California coast, approximately 280 miles north of San Francisco and 17 miles south of the Oregon border. The south-facing harbor occupies a natural indentation in the coastline and is protected by a 4,700-foot rubble mound outer breakwater to the west; a 2,400-foot sand barrier to the east; a 1,600 foot inner breakwater to the south; and the topography of the coastline to the north.

Federally-authorized construction of the harbor's outer and inner breakwaters, sand barrier, outer basin, and the 10-foot deep inner small boat basin was completed by 1957. A 400-foot extension to the inner breakwater was completed in 1973, and a 20-foot deep Inner Harbor Basin Channel and Entrance Channel was completed in 1983 (Leidersdorf 1975, USACE 1999a). As authorized in 1965, and following a 1999 Final General Reevaluation Report (USACE 1999b),

an access channel was constructed between the Inner Harbor Basin Channel and inner boat basin in 2000 (USACE 2006).

As shown in ***Figure 1***, the Inner Harbor contains two boat basins that are maintained by the Crescent City Harbor District. The Commercial Small Boat Basin (outer boat basin) has temporary moorage space for approximately 20 vessels. The outer basin also contains two fish processing plants with docks, a main dock (Citizens Dock), a marine repair facility equipped with a syncrolift, a dock for the U.S. Coast Guard (USCG), and other auxiliary commercial and recreational facilities. Citizens Dock is a publicly-owned, Y-shaped wooden dock originally constructed in 1950 and operated by the Crescent City Harbor District. It is primarily used for refueling, loading ice, and unloading commercial fish catch. The depths maintained in the outer basin range from -10 feet mean lower low water (MLLW) in the southern half adjacent to Whaler Island and -15 feet MLLW in the northern half adjacent to the Citizens Dock.

The Recreational Small Boat Basin (inner boat basin) was damaged by a tsunami in 2006 and completely destroyed by the March 11, 2011 tsunami. The rebuilding process took 3 years and the inner boat basin was re-opened in March 2014. The new inner boat basin was designed to resist a 50 year tsunami event, has 291 slips ranging in length from 30 feet to 70 feet, and is maintained to a depth of -15 feet MLLW.

To remain a viable option for commercial fishing activities, the Harbor must maintain accessibility of its navigation channels for a variety of vessels, especially larger commercial vessels. Dredging of the Entrance Channel and Inner Harbor Basin Channel has been conducted under the U.S. Army Corps of Engineers (USACE) Operations and Maintenance (O&M) program since 1936. The Marina Access Channel was deepened in 2000, at which time it also became part of the federal channel system. The authorized and maintained depths and widths of each federal channel are depicted in ***Table 1***.

Table 1. Authorized and Maintained Dimensions of Crescent City Harbor Federal Channels

Federal Channel	Depth (feet MLLW)		Width (feet)	
	Authorized	Maintained	Authorized	Maintained
Entrance Channel	-20	-20	200 to 320	200 to 320
Inner Harbor Basin Channel	-20	-15	200 to 300	200 to 300
Marina access channel	-20	-15	140 to 210	140 to 210

Portions of the inner harbor that are outside and adjacent to the federal channels are also maintained by the Crescent City Harbor District to a depth of -15 feet MLLW along the inner breakwater and to a depth of -12 feet MLLW northeast of the Marina Access Channel.

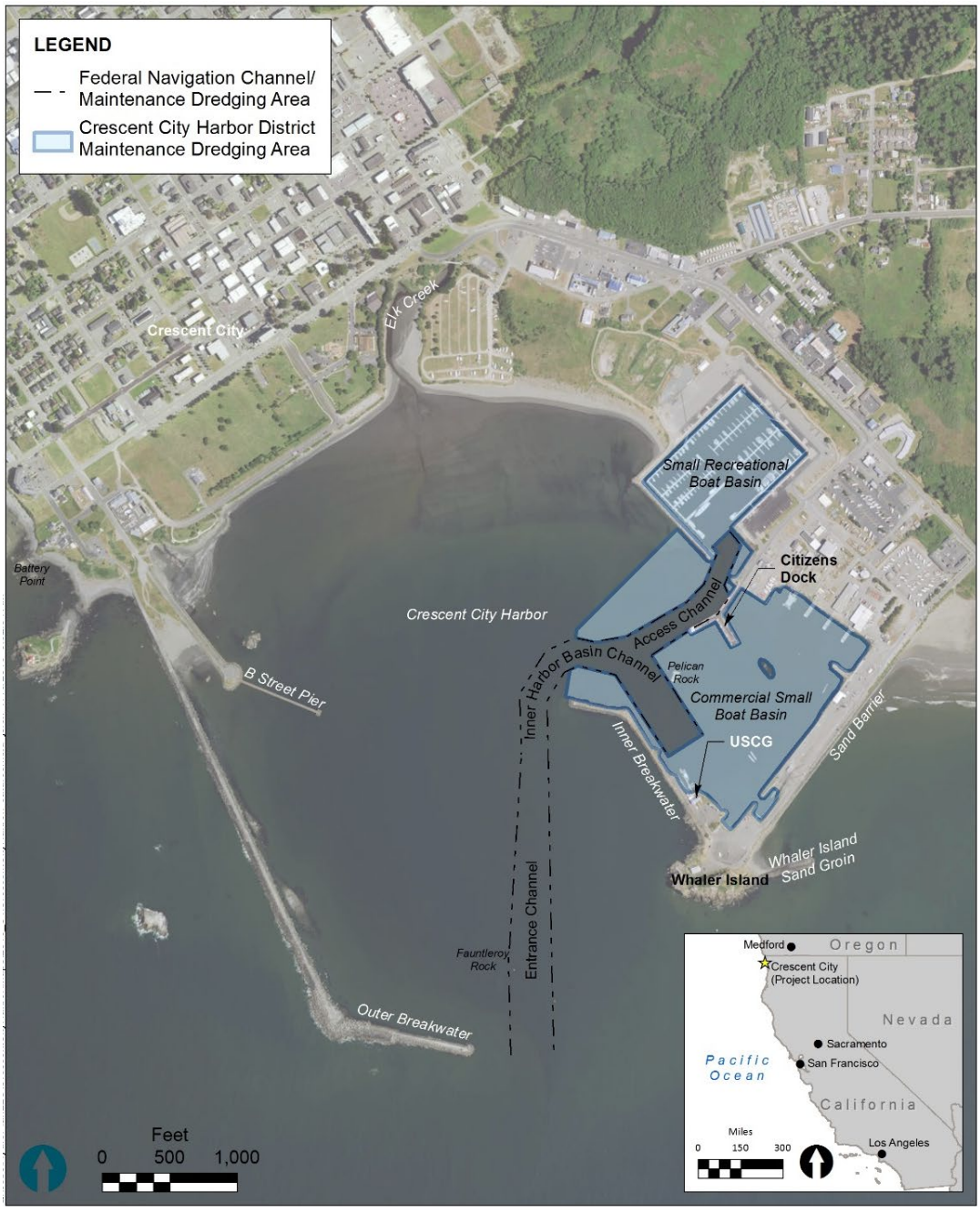

Figure 1. Crescent City Harbor Project Map

1.4 Project Authorization

The existing federal project for the improvement of the Crescent City Harbor was authorized by the Rivers and Harbors Act of 1918. It was based on the report printed in House Document 434 of the 64th Congress, First Session, and provided for construction of a rubble mound outer breakwater. The Crescent City Harbor District is the non-federal sponsor for the project. The documents authorizing improvements that comprise the existing federal project are summarized in ***Table 2***.

Table 2. Crescent City Harbor Project Authorizations

River and Harbor Act	Work Authorized	Documents
July 18, 1918	A breakwater bearing S. 26-1/4 E. from Battery Point to Fauntleroy Rock and breakwater from the shore to Whaler Island.	House Doc 434, 64th Congress, 1st Session
September 22, 1922	Modified condition of local cooperation, which required that local interests construct a railroad from Grants Pass, Oregon to Crescent City. State Highway to Grants Pass would be an acceptable alternative.	Committee Doc 4, 67th Congress, 2nd Session
January 21, 1927	Extension of the breakwater to a length of 3,000 feet and a reduced cash contribution required of local interests.	House Doc. 595, 69th Congress, 2nd Session
August 30, 1935	Maintenance by dredging of an outer harbor basin that is 1,800 feet long, 1,400 feet wide and 20 feet deep, except in rock.	Committee Doc 40, 74th Congress
August 26, 1937	Construction of a sand barrier from Whaler Island to the mainland and for maintenance dredging in the vicinity of the seaward end of the sand barrier	Senate Committee Print, 75th Congress, 1st Session
March 2, 1945	Extension of existing breakwater 2,700 feet to Round Rock (modified by USACE, 1952).	House Doc. 688, 76th Congress, 3rd Session
March 2, 1945	Construction of inner breakwater and removal of pinnacle rock and other material from the harbor to a depth of 12 feet and a harbor basin with a project depth of 10 feet.	Report on file in office, Chief of Engineers by 2nd Endorsement dated 23 August 1943
October 27, 1965	Extension of inner breakwater and dredging of T-shaped harbor basin to depth of 20 feet.	House Doc. 264, 89th Congress, 1st Session

1.5 Historical Maintenance Dredging

The Crescent City Harbor Entrance and Inner Harbor Basin Channels were first dredged under the USACE O&M Program in 1936. Since that time, maintenance dredging of the two channels has been conducted in 1937, 1938, 1939, 1956, 1957, 1964, 1965, 1976, 1982, 1983, 1988, 1993, and 1998, at intervals ranging from one to seventeen years between each episode. In 1999, only the Entrance Channel was dredged, and in 2000, the Marina Access Channel was deepened and became a federal channel. The Marina Access Channel and Entrance Channel was last dredged in 2009 and the Inner Harbor Basin was last dredged in 2011. Due to funding constraints, the Marina Access Channel and Entrance Channel were only dredged to -14 feet MLLW (with 1 foot of overdepth) in 2011, instead of the typically maintained -15 and -20 feet MLLW, respectively.

A hopper dredge was used to dredge the channels from 1936 to 1939. From 1956 to present, all dredging has been performed with a cutterhead dredge and hydraulic pipeline, aside from the use of a hopper dredge for a portion of the channels in 1982. Based on dredged volumes from 1936 to 2011, a total of approximately 896,600 cubic yards has been dredged from the Crescent City Harbor federal channels. ***Table 3*** summarizes the dredged volumes from the Crescent City Harbor federal channels since 1936.

Table 3. Crescent City Harbor Federal Channels Historical Dredged Volumes

Year	Channels	Volume (cy)
1936	Inner Harbor Basin and Entrance Channels	48,449
1937	Inner Harbor Basin and Entrance Channels	27,756
1938	Inner Harbor Basin and Entrance Channels	16,353
1939	Inner Harbor Basin and Entrance Channels	58,396
1956/1957	Inner Harbor Basin and Entrance Channels	120,466
1964/1965	Inner Harbor Basin and Entrance Channels	187,372[b]
1976	Inner Harbor Basin and Entrance Channels	61,013
1982	Inner Harbor Basin and Entrance Channels	125,319
1983	Inner Harbor Basin and Entrance Channels	40,221
1988	Inner Harbor Basin and Entrance Channels	62,192
1993	Inner Harbor Basin and Entrance Channels	37,487
1999/2000	Entrance Channel and Marina Access Channel	35,000
2009	Marina Access Channel	34,947
2011[a]	Inner Harbor Basin and Entrance Channels	41,630
Total		**896,601**

Note:

a. Due to funding, the Entrance channel and Marina Access Channel were only dredged to -14 feet MLLW (with 1 foot of overdepth) in 2009.

b. The 1964 tsunami may have contributed to the larger than usual volume.

1.6 Projected Maintenance Dredging Volumes

Based on the dredged volumes from 1936 to 2000[1,2], the average shoaling and dredging rate for the Entrance and Inner Harbor Basin Channels was approximately 12,000 cubic yards of material per year. Based on a 2005[2] hydrographic survey, the Marina Access Channel was estimated to shoal at an average rate of approximately 8,000 cubic yards per year since its deepening in 2000. Therefore, it is estimated that the combined average shoaling and dredging rate for the Entrance, Inner Harbor Basin, and Marina Access Channels is approximately 20,000 cubic yards per year (cy/yr), which equates to approximately 100,000 cubic yards every 5 years (HydroPlan and Anchor QEA 2015).

[1] Dredged volumes after 2000 are not included to determine the average shoaling and dredging rate because the 2011 dredge event was limited and did not dredge to the maintained project depth or include overdepth.

[2] Due to tsunamis in 2006 and 2011, more recent shoaling estimates and dredged volumes are not likely indicative of typical shoaling in Crescent City Harbor or the federal channels. Thus, historical pre-tsunami estimates are used to conservatively estimate shoaling for planning purposes.

Table 4 shows the estimated volumes of sediment required to be dredged to achieve the authorized and overdepth from all three federal channels based on a 19 February 2019 hydrographic survey. The dredging footprint based on the 19 February 2019 survey is shown on ***Figure 2***.

Table 4. Crescent City Harbor Federal Channels Maintenance Dredging Volumes per 2019 Survey

Depth	Volumes (cubic yards)
Authorized Depth	48,154
Authorized Depth + 1-Foot Overdepth	80,648
Authorized Depth + 2-Foot Overdepth	117,559

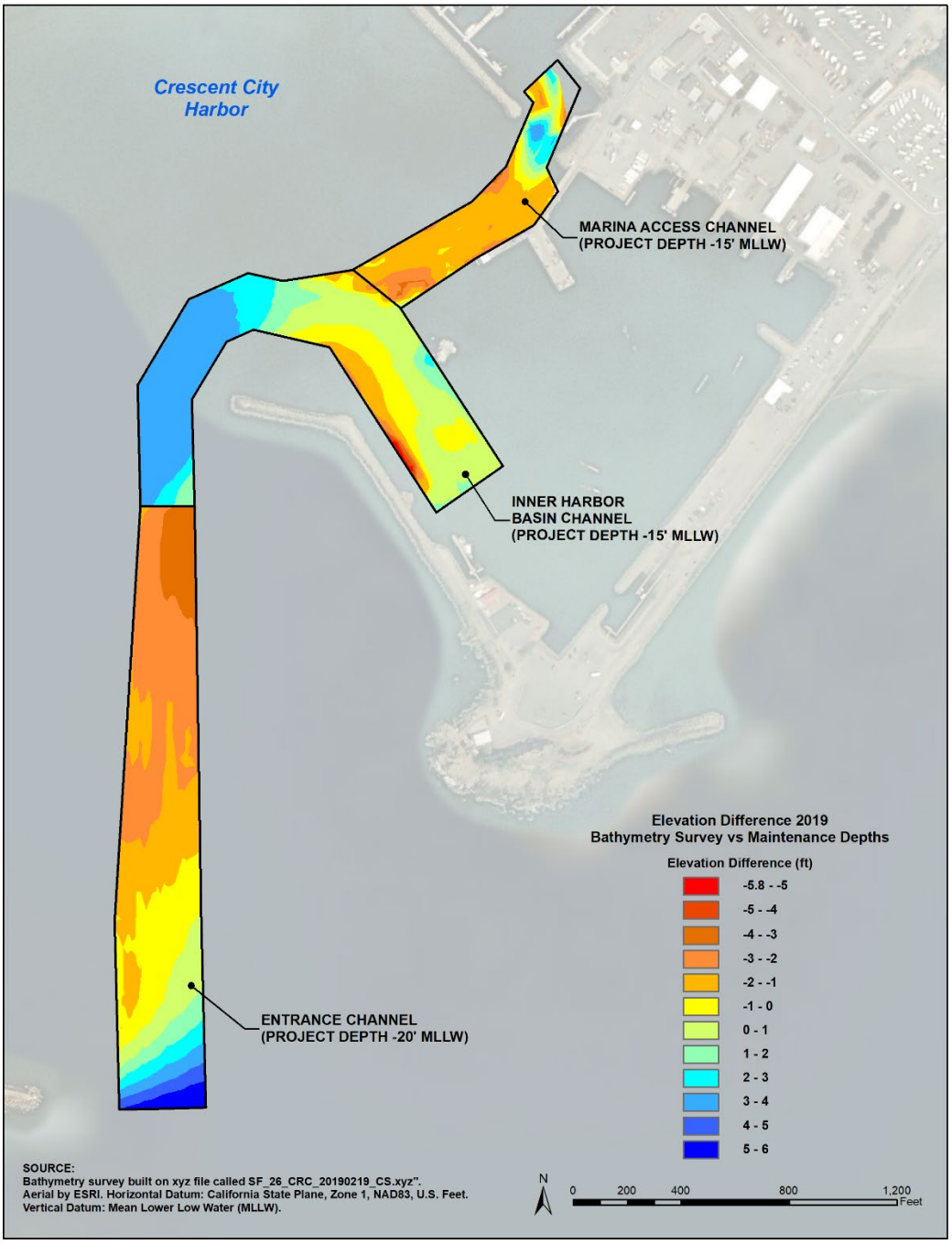

Figure 2. Crescent City Harbor Federal Channel Dredging Footprint Based on 2019 Hydrographic Surveys

The next maintenance dredging episode is scheduled to occur in the August - September timeframe, 2019. Consequently, there will have been 7 months of additional shoaling on top of what existed in February 2019. At the projected shoaling rate of 20,000 cubic yards per year, or 1667 cubic yards per month, over the course of 7 months added to the volume of material identified in the February 2019 survey (117,559 cubic yards), the anticipated volume of material to be dredged in September 2019 would be 129,286 cubic yards. Projected dredged volumes for the 2019 dredging episode rounded to the next highest thousand are summarized in ***Table 5***.

Table 5. Crescent City Harbor Federal Channels Projected Maintenance Dredging Volumes

	Volumes (cy)	
Channel	**February, 2019**	**September, 2019**
Entrance Channel	72,000	77,000
Inner Harbor Basin Channel	22,000	26,000
Marina Access Channel	23,000	28,000
Total Volume	**118,000**	**131,000**[1]

1. Values for each channel's volume and for the total volume were rounded to the next highest thousand. Channel-specific totals may therefore not add up to the total volumes shown in the table.

2 Potential Dredged Material Placement Sites

The following potential dredge material placement sites were evaluated in the dredge material management plan (HydroPlan and Anchor QEA 2015). While included below in this section, the Chetco and Rogue placement sites have been determined to be non-viable for the material from Crescent City for the 2019 episode as further described in Section 3.3.

2.1 Whaler Island

Whaler Island is a promontory that is adjacent to Crescent City Harbor (***Figure 1***). It covers approximately 5.5 acres of land located at the vertex formed by the sand barrier on the eastern side of Crescent City Harbor and inner breakwater. There is no set volume limit on the combined annual total of suitable federal and non-federal material that can be placed at Whaler Island; however, placement is limited to material that meets certain physical and chemical sediment standards, particularly for grain size and organic carbon content. Typically, for material to be suitable for placement at Whaler Island, the grain size should be greater than 75% sand and the total organic carbon (TOC) should be less than 2%. The sand grain size is not specified, but typically sands range from very coarse (-1 phi [2 millimeters]) to very fine (4 phi [0.0625 millimeters]).

Coordination with the California Coastal Commission (CCC), North Coast Regional Water Quality Control Board (NCRWQCB), National Marine Fisheries Service (NMFS), and U.S. Fish and Wildlife Service (USFWS) must be performed prior to placing sandy material at Whaler Island.

2.2 Crescent City Dredge Pond

In 1998, testing results for the Inner Harbor Basin Channel sediment failed the criteria for placement at Whaler Island due to a low percentage (34%) of sand content. Crescent City Harbor District's 1999 sampling results from the non-federal areas of the harbor also failed the criteria for placement at Whaler Island due to low percentages (51.7% to 56.6%) of sand content. In response, the Crescent City Harbor District formed an agreement with the USACE to create and place dredged material in the Crescent City dredge pond. The dredge pond are located adjacent to the Crescent City Harbor on land just north of the inner boat basin. The dredge pond was built with funding from the federal government and Crescent City Harbor District in 2000 and are owned by the Crescent City Harbor District. In 2009, predominantly fine-grained dredged material from the Inner Harbor Basin Channel was placed at the pond due to a low percentage of sand content.

Though the dredge pond has a total capacity of approximately 70,000 cubic yards, it is currently full and would need to be emptied of material in order to be used. In the recent past, the Crescent City Harbor District has engaged with several parties interested in beneficially using the soil stockpiled in the dredge pond, but permitting issues have constrained the feasibility of these opportunities to date (e.g., levels of arsenic in the stockpiled soil that are similar to background levels in the region have prevented unrestricted reuse). While beneficial reuse of the dredge pond material could still be an option, no specific beneficial reuse options have been identified. The viability of beneficial reuse of material from the dredge pond is too uncertain for current planning.

Another option to restore capacity within the dredge pond would be to excavate the stockpiled soil and place it in a landfill. The excavated soils could be picked up by the Del Norte Solid Waste Management Authority (DNSWMA), transported to the Del Norte County Transfer Station at 1700 State Street in Crescent City (approximately 1 mile from the dredge pond), and transferred to an appropriate landfill. Once the dredged material is picked-up by the DNSWMA, the handling and placement of the excavated material would become the responsibility of the DNSWMA. Once the pond capacity is restored, the site could be used for the placement of finer sediments that would not be suitable for Whaler Island. To date, the necessary coordination (e.g. Waste Discharge Requirements concurrence from the North Coast RWQCB) has not been completed for placement of material from the dredge pond.

2.3 Humboldt Open Ocean Disposal Site

The Humboldt Open Ocean Disposal Site (HOODS) was designated as an open-ocean placement site by the U.S. Environmental Protection Agency (USEPA) in 1995 per Section 102 of the Marine Protection, Research, and Sanctuaries Act (MPRSA). The site is located approximately 66 miles south of Crescent City Harbor and 3.5 miles northwest of the mouth of Humboldt Bay (***Figure 3***). The site spans approximately 1.3 square miles, with depths between 160 and 180 feet. Placement is limited to suitable dredged material from Northern California dredging sites and can include sand and fine-grained sediments (USEPA 2006).

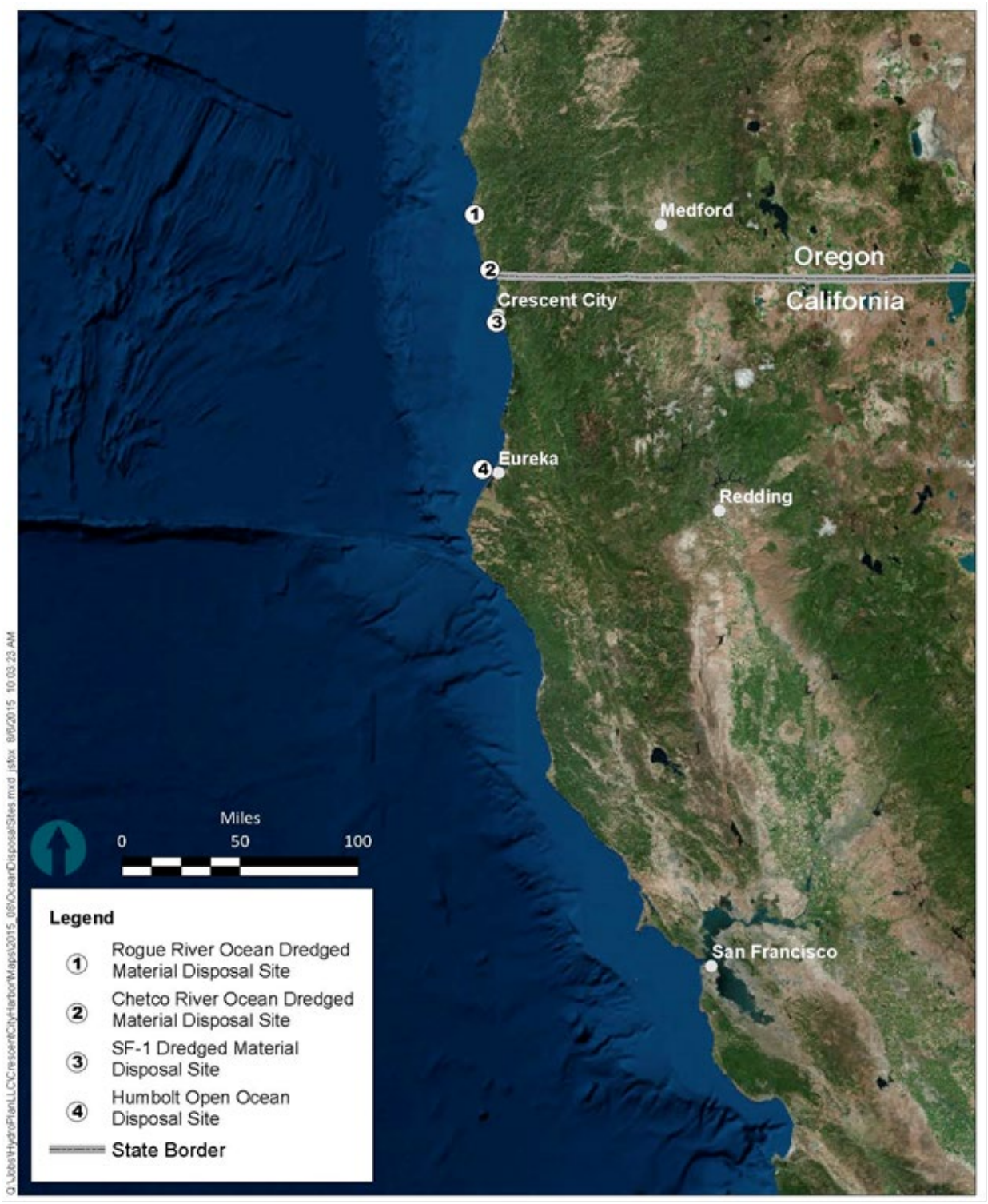

Figure 3. Alternative Dredged Material Placement Areas

The 1995 Environmental Impact Statement (EIS) (USEPA 1995) prepared for HOODS states that the site has a capacity of 50 million cubic yards over a 50-year period (or 1 million cubic yards per year). However, capacity was estimated before knowing exactly what volume of dredged material the site could disperse. For example, from 2000 to 2005, HOODS dispersed an average of 1.25 million cubic yards of dredged material per year without problems, and in 2003, the site handled 1.8 million cubic yards without significant mounding. In recent years, however, mounding at HOODS has become evident and, as a result, USEPA Region 9 is in the process of expanding the site to increase dispersion to reduce the mounding.

In the meantime, USEPA Region 9 officials have indicated that HOODS could still accommodate the forecasted sediment to be dredged from the Crescent City Harbor federal channels as well as within the Crescent City Harbor without overtaxing the site due to the relatively small volume and limited frequency as compared to Humboldt Bay dredging projects. HOODS can accept both sandy and fine-grained dredged material, but USEPA prefers that sandy material be used for beneficial reuse and will only allow sandy material to be placed at HOODS if no other cost-effective beneficial reuse option is available. Coordination with USEPA Region 9 must be sought to place dredged material at HOODS.

2.4 Rogue River Ocean Dredged Material Disposal Site

The Rogue River Ocean Dredged Material Disposal Site (Rogue) is located near the mouth of the Rogue River and is primarily intended to receive suitable dredged material from Gold Beach Harbor and associated federal navigation channels. The site is located approximately 50 miles north of Crescent City Harbor and 1 mile southwest of the entrance to the Rogue River (***Figure 3***). The site dimensions are 3,600 feet long by 1,400 feet wide, with water depths ranging from 50 feet to 90 feet (***Figure 4***).

No rare or unique features or habitats exist within Rogue. The site is situated within sight of the shoreline in an open and dynamic ocean environment. The seafloor is characterized as relatively uniform and featureless with highly active shifting sands grading to rock/gravel in deeper water.

Rogue has been used by the USACE Portland District since 1962. Typically, only sandy material has been placed of at the site due to the predominance of sand in the areas dredged regionally. Between 1986 and 2007, a total of approximately 1.1 million cubic yards of dredged material was placed in Rogue, which represents an average annual placement of 51,000 cubic yards without persistent mounding. Annual bathymetric surveys show that dredged material redistributes out of the site. Based on current levels of use, site capacity appears to be unlimited over the long-term.

The total annual capacity of Rogue is not defined; however, the largest annual volumes placed at the site historically were just over 100,000 cubic yards. Based on the maintenance dredging events that occurred between 2008 and 2013, an annual average of approximately 37,000 cubic yards of sediment was dredged from the federal navigation channels and within Gold Beach Harbor. Therefore, it can conservatively be assumed that the maximum annual capacity for dredged material placement at Rogue from outside of Gold Beach Harbor would be approximately 63,000 cubic yards.

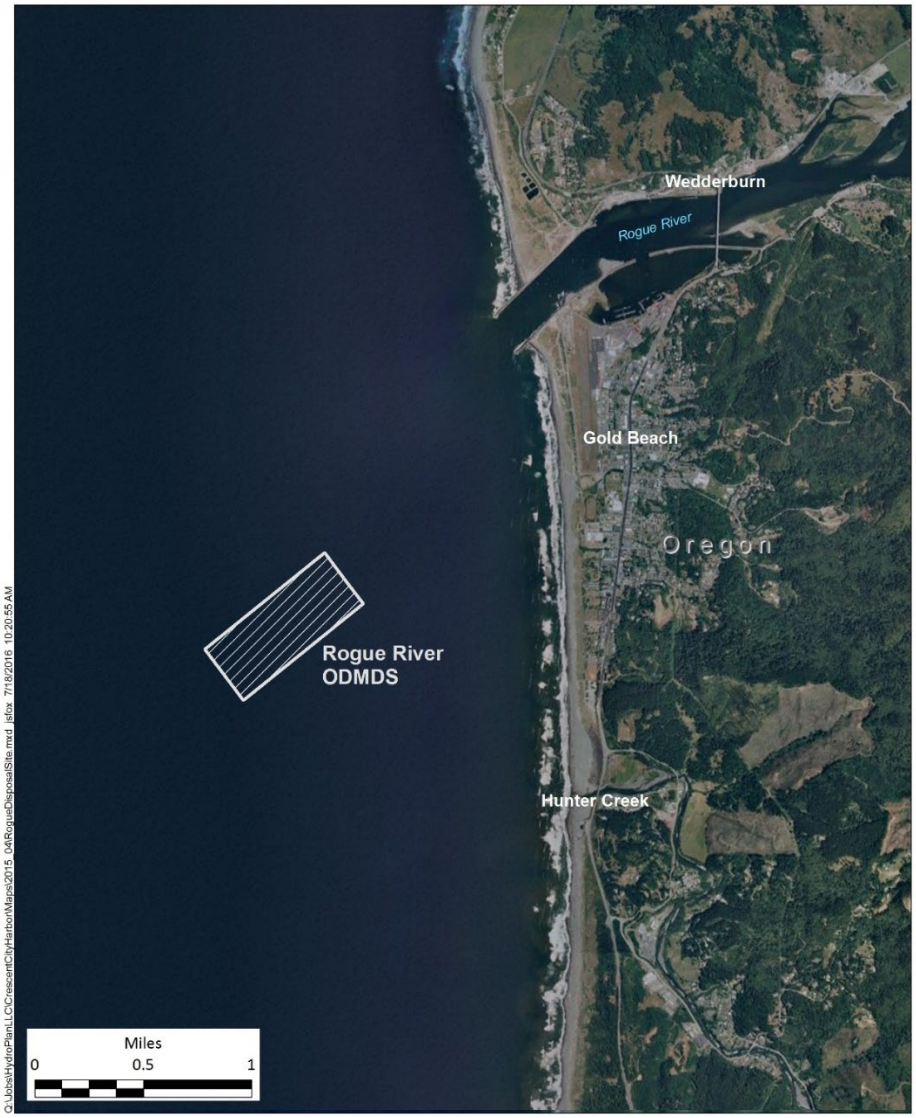

Figure 4. Rogue River Ocean Dredged Material Disposal Site (Rogue)

Coordination from USEPA Region 10 would be sought for placement of dredged material at Rogue (USACE/USEPA 2009). USEPA Region 10 has preliminarily indicated for the long-term, only sandy material would be permitted for placement at the site, but that a one-time placement of fine-grained material would likely be permissible in the event that no other options were available for near-term maintenance dredging needs.

2.5 Chetco River Ocean Dredged Material Disposal and Nearshore Placement Site

The Chetco River Section 102 Ocean Dredged Material Disposal Site (Chetco) is located on the southern Oregon coast, approximately 10 miles north of the California border and within 3 miles of the Port of Brookings/Brookings Harbor in Oregon (***Figures 3 and 5***). The Chetco Nearshore Placement Area is located between the ocean site and the harbor, about 1,000 feet from the mouth of the Chetco River.

The ocean site is approximately 30 miles north of Crescent City Harbor and 1 mile south of the entrance to the Chetco River. It spans approximately 0.12 square miles and has an average depth of 70 feet. Placement is limited to dredged material suitable for unconfined placement from the Chetco Estuary and River and adjacent areas.

The Chetco ocean site was used on an interim basis between 1977 and 1986 for placement of dredged material from Brookings Harbor. During that time, the average dredged material placement volume was 48,000 cubic yards per year. In 1986, Chetco was officially designated an ocean placement site; however, annual volumes dropped to 33,000 cubic yards between 1985 and 1989. Since then, placement at the Chetco has ranged from a low of 7,800 cubic yards in 1977 to a maximum quantity of 76,300 cubic yards in 1981. The site has been used less in recent years because the USACE Portland District has been able to beneficially reuse dredged material for beach nourishment at a Chetco nearshore placement site to provide material to the beach south of the Chetco River jetties.

While there is no set annual limit on the amount of dredged material that may be placed at the Chetco ocean site, the site's EIS assumed a total of 48,000 cubic yards per year based on typical usage at the time it was prepared. This amount is a guideline for use of the site; the EIS does not set a volume limit. However, due to its strong current action Chetco can disperse placed material fairly quickly. Placement of fine-grained sediment at Chetco is not typically permitted by USEPA, but sandy material (>80% sand) is considered suitable for placement at the site. In recent years, USEPA has required sediment to be placed in specific areas to avoid potentially impacting sensitive environments (e.g., reefs) located within the boundaries of the Chetco site (USEPA 1991).

Figure 5. Chetco River Ocean Dredged Material Disposal Site and Nearshore Placement Site

For placement of sediment at Chetco, coordination with both the USACE Portland District and USEPA Region 10, who have co-jurisdiction over the site, would be carried-out. When placing

material at Chetco testing would be done to confirm that the Crescent City Harbor dredged sediment is suitable to be placed at the site.

The Chetco nearshore placement area (***Figure 5***) could also be considered for beneficial reuse of sandy material (>80% sand) dredged from the Crescent City Harbor. The water depth at the nearshore site ranges from approximately 18 feet to 30 feet. The site is approximately 1,500 feet long by 500 feet wide. As of 2014, an annual maximum of 40,000 cubic yards of dredged sand was allowed to be placed at the nearshore site.

The total annual capacity of the nearshore and ocean sites combined is 88,000 cubic yards, but an approximate average of 22,000 cubic yards is dredged from Brookings Harbor (including from within the harbor and federal navigation channels) annually based on the dredge events from 2008 to 2013, which conservatively leaves 66,000 cubic yards of capacity for sandy material from outside of Brookings Harbor.

To place sediment at the Chetco nearshore placement area, coordination with the USACE Portland District and the Oregon Department of Environmental Quality (ODEQ) would be carried-out.

3 Alternatives

A set of near-term alternative plans for the 2019 maintenance dredging episode were formulated. The no action alternative and agency-preferred alternative are described in section 3.1 and 3.2, respectively. Alternatives considered but eliminated from further analysis in this environmental assessment are described in section 3.3.

3.1 No Action Alternative

Under the No Action Alternative it is assumed that no additional federal maintenance dredging would take place, and shoaling would continue in the federally maintained channels. The Crescent City Harbor may have capacity to perform maintenance dredging. However, any sediments excavated currently could not be placed at the dredge pond due to inadequate volume and these would need to be placed in a landfill first. To accommodate sediments from the Inner Harbor Basin Channel about 26,000 cubic yards of material would be excavated from the dredge pond and then transported by the Del Norte Solid Waste Management Authority (DNSWMA) to an appropriate landfill. The Crescent City Harbor District has expressed that they may not have the financial resources to empty the dredge pond to this volume (HydroPlan and Anchor QEA 2015).

It is unlikely that USACE would dredge the Entrance Channel if shoaling in the Inner Harbor and Marina Access Channel provided limited navigation depths. As a result, the No Action Alternative would consist of no additional federal maintenance dredging until capacity is available. The federal navigation channels would continue to shoal and navigability of the channels would eventually become limited.

3.2 Proposed Action

The Proposed Action is the agency-preferred alternative and consists of: 1) hydraulically (cutterhead) dredging approximately 104,054 cubic yards of sandy material from the Entrance Channel & Marina Access Channel and pumping it for placement at Whaler Island; and 2) mechanically (hopper) dredging approximately 25,231 cubic yards of silty material from the Inner Harbor Basin Channel and transporting it 66 miles by barge for placement at HOODS.

3.2.1 Proposed Dredging and Placement Methodologies

Dredging at the Crescent City Harbor would occur using a hydraulic cutterhead suction dredge and a mechanical (hopper) dredge. The specific dredging method used will depend on the placement approach; silty sediment would be mechanically dredged and barged to the ocean for placement, whereas sandy sediment would be hydraulically dredged and pumped to the Whaler Island site.

3.2.1.1 Hydraulic (Cutterhead) Dredging

Sandy sediment proposed to be placed at the Whaler Island site would be dredged primarily from the Entrance Channel and Marina Access Channels by a 1,500 to 2,500 horsepower hydraulic cutterhead suction dredge. A hydraulic dredge is a barge-type vessel that consists of an onboard pump(s), spud piles (long pipes), and a toothed cutterhead attached to a pipeline. The cutterhead is mounted to a ladder that can be lowered, raised, and angled to target material for dredging. The transport pipeline exits at the back (stern) of the dredge.

Once the dredge is positioned, the ladder with cutterhead would be lowered to the bottom of the channel. The cutterhead would then slowly start to rotate and break up sediment along the seafloor, continuing from side to side in a sweeping arc. The hydraulic dredge would move along the channel self-propelled by walking with its spuds or controlled by tugboat, and a crew would maintain and operate the dredging equipment at all times. Skiffs and a tugboat (with a total of about 500 horsepower) would be used for crew transport, maintenance, and other operations associated with dredging activities.

The dredge slurry is expected to consist of 80% to 90% water and 10% to 20% solids by volume. This ratio is dependent upon several factors, such as physical characteristics of the dredged material, thickness of dredge cuts (e.g., thin cuts result in more water and less sediment), and transport distance.

The dredge pipeline would transport dredge slurry to the Whaler Island site. The pipeline would be made of durable plastic (PVC) or steel and would likely float on pontoons or floats. Depending on which areas are being dredged, the length of the pipeline would range from 1,500 feet to 3,000 feet. If navigational access over the pipeline is required, one or more sections of the pipeline system can be submerged and anchored to the bottom of the seafloor. Pipeline sections and anchors not in use would either be secured on a floating barge, capped and lashed together to float in the channel, or stored in designated staging areas. One booster pump may be needed to accommodate the maximum pumping distance. The contractor would determine the preferred route for the pipeline from the dredge site to the placement site, and buoys would be positioned to warn boaters of the pipeline's presence. The dredging duration would be approximately 7 weeks.

During dredging operations, daily observations would be made to verify if water flow through culverts under US Highway 101 is being impeded by accumulation of material on the downstream portions of the beach. If it is determined that flow is being impeded, the contractor would be required to contact USACE in order to determine a corrective course of action as per the monitoring conditions agreed upon by USACE, USFWS, and the CCC.

3.2.1.2 Mechanical Dredging

Finer-grained sediment dredged from the Inner Harbor and would be dredged by an approximately 500 horsepower mechanical dredge. A typical mechanical dredge consists of a crane mounted on a floating flat deck barge, with a dredging bucket (e.g., clamshell or environmental closed) on the end of the crane boom. The barge would have 2 to 4 spud piles to anchor the dredge, likely located at the corners. The mechanical dredge would move along the channel self-propelled by walking with its spuds or controlled by tugboat, and a crew would maintain and operate the dredging equipment at all times.

Once the dredge is positioned, the spud piles would be anchored vertically into the seafloor. The mechanical dredge, typically powered by a diesel generator, would then lower and raise the dredge bucket through the water column using a series of cables and winches. The weight of the dredge bucket allows it to sink into the sediment, with the cables restricting the clamshell from falling too deep or beyond the maximum allowable overdepth. The dredge bucket is then closed, raised up through the water column, and swung over to place material into a bottom dump or split hull barge. Unlike hydraulic cutterhead dredging, little additional water is entrained by mechanical dredging equipment. The dredging duration would be approximately 6 weeks.

When all the material within the swing reach of the mechanical dredge is removed, the spud piles would be raised and the tug (approximately 500 horsepower) would relocate the dredge

equipment. The process would repeat until all required dredging is completed. Once a haul barge is full, it would be transported by tug 66 miles to HOODS, the doors along the bottom of the barge would be opened, and the dredged sediment would be discharged into the site.

3.2.1.3 Timing and Duration

For calendar year 2019, the USACE proposes to maintenance dredge the federal navigation channels at Crescent City Harbor within the environmental work window, which is July 1 – October 15, as established by the California Department of Fish & Wildlife (CDFW), and which the USACE recognizes as a matter of comity. USACE also intends to request an extension of the work window to November 15, provided that heavy rains have not begun.

The work will consist of two parts. The first part is preliminary, taking up to 8-weeks for written submittals (Environmental Protection Plan, Safety Plan, Quality Control Plan, etc.) and for mobilization. The second part involves in-water dredging activity, both hydraulic and mechanical, and is scheduled to last up to 6 weeks. The in-water activity will consist of 3 weeks for dredging and 3 weeks for contractor survey, the clean-up of high spots, and demobilization.

As currently scheduled, the contract award, and NTP, is planned for early- to mid-August 2019. Because inclement weather with rough seas is expected in October, USACE expects that in-water work must be completed by the end of September. Given this, it may become necessary to postpone some dredging activities into calendar year 2020.

3.3 Alternatives Eliminated from Consideration

Alternatives that were considered, but eliminated from further consideration in this EA are described below.

3.3.1.1 Alternative 1: Dredging with placement at Chetco, HOODS, & Rogue

This alternative consists of dredging the federal navigation channels at Crescent City as described under the Proposed Action, but with placement of sands at Chetco to the maximum extent possible, placement of the remaining sands at Rogue, and placement of silty material at HOODS. This alternative assumes that 66,000 cubic yards of sandy sediment will be placed nearshore or ocean placed at Chetco (this would utilize all of the site's assumed maximum annual capacity), 38,000 cubic yards of sandy sediment will be placed at Rogue, and 26,000 cubic yards of fine-grained sediment will be placed at HOODS. This alternative proposes the placement of sediment composition types at the ocean sites that are consistent with the USEPA's stated preferences. However, Chetco and Rogue were designated as only available for placement of locally sourced sediments, from Chetco River & Estuary and Rogue River

navigation channel & adjacent areas (Personal Communication on 25 April 2019, B. Lohrman[3]). Therefore, because Chetco and Rogue are not available for placement of material dredged from Crescent City Harbor during the proposed 2019 episode, this alternative was eliminated from further consideration in this EA.

3.3.1.2 Alternative 2: HOODS & Rogue

This alternative consists of dredging the federal navigation channels at Crescent City as described under the Proposed Action, but with placement of sands and silty material at HOODS and/or Rogue. While HOODS has adequate capacity for all of the projected 2019 maintenance dredged material, and can accept both sandy and fine-grained material, Rogue is only suitable for placement of course grained material. As such, if Rogue were to be used, it would be in conjunction with HOODS. However, Rogue was designated as only available for placement of locally sourced sediments from the Rogue River Navigation Channel and adjacent areas (Personal Communication on 25 April 2019, B. Lohrman[3]). Therefore, because Rogue is not available for placement of material dredged from Crescent City Harbor during the proposed 2019 episode, this alternative was eliminated from further consideration in this EA.

4 Affected Environment, Environmental Consequences, and Mitigation

4.1 Aesthetics

4.1.1 Affected Environment

Aesthetic evaluations are inherently subjective, although certain views are widely held to be scenic. Crescent City Harbor is considered to be scenic due to its natural setting and built environment. The Harbor is set in a unique indentation in the northern California shoreline. The combination of the breakwater, the sand barrier, Whaler Island, and the Harbor's docking facilities create a visually pleasing atmosphere. Several picturesque sea stacks such as Fauntleroy Rock and Round Rock dot the area surrounding the Harbor. The adjacent areas within the Town of Crescent City are also picturesque. Additionally, the Battery Point Lighthouse is located just north of the Outer Breakwater and offers a famously scenic view (***Figure 6***).

[3] Ecologist, USEPA Region 10.

Figure 6. Battery Point Lighthouse

4.1.2 Environmental Consequences

4.1.2.1 No Action Alternative

The No Action Alternative would not cause any changes to the area aesthetics. Therefore, there would no impact on aesthetics.

4.1.2.2 Proposed Action

Aesthetics may be considered to be slightly degraded during dredging activities due to the presence of dredge equipment in the Harbor. These impacts would be temporary (6-7 weeks) and would occur only within the Federal channels where dredging has occurred in the past. Therefore, impacts of the Proposed Action would be less than significant.

4.1.3 Mitigation

Impacts of the Proposed Action on aesthetics would be less than significant and would not require mitigation.

4.2 Air Quality, Climate Change, and Greenhouse Gases

4.2.1 Affected Environment

4.2.1.1 Air Quality

Based on the federal Clean Air Act (CAA) passed in 1970, the USEPA has identified six criteria air pollutants (***Table 6***) that are pervasive in urban areas and for which state and national health-based ambient air quality standards have been established. These pollutants can injure health, harm the environment, and cause property damage. USEPA has developed science-based guidelines as the basis for setting permissible levels of these criteria pollutants.

The USEPA is responsible for implementing most aspects of the CAA. Basic elements of the act include the National Ambient Air Quality Standards (NAAQS or "national standards") for major air pollutants, hazardous air pollutant standards, attainment plans, motor vehicle emission standards, stationary source emission standards and permits, acid rain control measures, stratospheric ozone protection, and enforcement provisions.

NAAQS apply to the concentration of a pollutant in outdoor air. If the air quality in a geographic area meets or does better than the national standard, it is referred to as an attainment area. Areas that do not meet the national standard are referred to as non-attainment areas.

The California Air Resources Board (CARB) has established air quality standards for California similar to the NAAQS. The California Ambient Air Quality Standards (CAAQS) are either the same as, or more restrictive than the NAAQS (***Table 6***). These legal limits on outdoor air pollution are designed to protect the health and welfare of Californians.

Table 6. National and California Ambient Air Quality Standards

Pollutant		Averaging Time	National Standard	California Standard
Carbon Monoxide (CO)		8 hours	9 ppm	9 ppm
		1 hour	35 ppm	20 ppm
Lead (Pb)		Rolling 3 month	0.15 µg/m^3	1.2X10^{-5} µg/m^3
Nitrogen Dioxide (NO_2)		1 hour	100 ppb	180 ppb
		1 year	53 ppb	30 ppb
Ozone (O_3)		8 hours	0.07 ppm	.07 ppm
Particulate matter (PM)	$PM_{2.5}$	1 year	12 µg/m^3	12 µg/m^3
	PM_{10}	24 hours	150 µg/m^3	50 µg/m^3
Sulfur Dioxide (SO_2)		1 hour	75 ppb	25 ppb
		3 hours	0.5 ppb	-

The CAA requires each state to prepare an air quality control plan referred to as the State Implementation Plan (SIP) for areas that are not compliant with the NAAQS (i.e., non-attainment areas). The CAA amendments added requirements for states containing areas that violate the NAAQS to revise their SIPs to incorporate additional control measures to reduce air pollution. The SIP is a living document that is modified periodically to reflect the latest emissions inventories, planning documents, and rules and regulations of air basins as reported by the agencies with jurisdiction over them.

The USEPA has responsibility to review all SIPs to determine if they conform to the mandates of the CAA amendments and will achieve air quality goals when implemented. If the USEPA determines a SIP to be inadequate, it may prepare a Federal Implementation Plan for the nonattainment area and may impose additional control measures. Failure to submit an approvable SIP or to implement the plan within mandated timeframes can result in sanctions being applied to transportation funding and stationary air pollution sources in the air basin.

California's air quality is monitored and regulated at the state level by CARB and at the local and regional level by air pollution control authorities known as Air Pollution Control Districts (APCD) or Air Quality Management Districts (AQMD). The air districts' roles include developing clean air plans to manage local attainment, which feed into the State's SIP. The project is located in the North Coast Air Basin under the jurisdiction of the North Coast Unified Air Quality Management District (NCUAQMD).

The NCUAQMD operates several local air quality monitoring stations within its tri-county jurisdiction of Humboldt, Del Norte, and Trinity Counties. Based on this air quality monitoring, Del Norte County is an attainment area for all criteria pollutants for the NAAQS and CAAQS.

4.2.2 Environmental Consequences

Section 176(c) of the CAA states that a federal agency cannot issue a permit for, or support an activity unless the agency determines it will conform to the most recent USEPA approved SIP. General conformity requirements were adopted by Congress as part of the CAA and were implemented by USEPA regulations in the November 30, 1993, Federal Register (40 Code of Federal Regulations [CFR] Sections 6, 51, and 93: "Determining Conformity of General Federal Actions to State or Federal Implementation Plans; Final Rule"). General conformity requires that all federal actions conform to the SIP as approved or promulgated by the USEPA by determining that the action is either exempt from the General Conformity Rule requirements or subject to a formal conformity determination. General Conformity applies to areas designated as nonattainment or maintenance for NAAQS and in such areas, a project is exempt from the conformity rule if the total net project-related emissions (construction and operation) are less than the *de minimis* thresholds established by the conformity rule. A project that produces any of the 10 emissions that exceed conformity thresholds shown in the table of de minimis emission levels is required to mitigate or offset these impacts (USEPA, 2016).

In accordance with 40 CFR § 51.853(c)(2)(ix), USACE has determined the proposed agency action is exempt from the requirement to prepare a conformity determination with the State Implementation Plan under the Clean Air Act because the project consists of maintenance dredging, no new depths are required, and placement would be at an approved placement site.

Moreover, Del Norte is an attainment area for all the criteria pollutants and is not required to establish an SIP and the NCUAQMD has not formally adopted significance thresholds for criteria pollutants. Therefore, the conformity thresholds (40 CFR 93 § 153) do not apply.

The conformity thresholds are instead used here as a reference for the level of significance of the impacts on air quality.

Table 7. General Conformity de Minimis Thresholds for Construction Emissions

Pollutant	*De Minimis* Thresholds (tons/year)
O_3 (ROG, VOC or NO_X)	100
CO	100
NO_2	100
SO_2	100
$PM_{2.5}$	100
PM_{10}	100
P_b	25

Source: (40 CFR 93.153)

Emissions from commercial harbor craft, including dredges, tugs, and work boats are regulated by CARB under the Airborne Toxic Control Measure for Diesel Engines on Commercial Harbor Craft within California Waters and 24 Nautical Miles of the California Coast Regulation. The regulation was enacted in 2007 with a goal of significantly reducing diesel particulate matter (DPM) and NO_X emissions from harbor craft. It establishes specifications for diesel engines and fuel that must be met. This regulation was assumed in the analysis.

The basic equation used to calculate main propulsion and auxiliary engine emissions from the dredging equipment is:

$$Equip_{Emiss} = \frac{EF\ X\ Time\ X\ EngineHP\ X\ LFwt}{(453.6\ X\ 2000)}$$

Where:

$Equip_{Emiss}$ = Dredge, tender, survey boat, or haul barge emissions in tons per year
EF = Engine **emission factor** in grams per brake horsepower-hour
Time = Annual **operating time** in hours
EngineHP = **Engine brake horsepower** rating
LFwt = Time weighted engine **load factor** (fraction of full load), based on different engine operating modes
(453.6 X 2000) = Conversion factor from grams to tons

4.2.2.1 No Action Alternative

Because there is no federal dredging associated with the No Action Alternative, there will be no new emissions, and therefore, no changes in regards to air quality.

4.2.2.2 Proposed Action

A hydraulic dredge will be used to remove about 78,000 cubic yards of sandy material from the Entrance Channel and pump it to Whaler Island. A mechanical (clam shell) dredge will remove about 54,000 cubic yards of silty material which will then be transported by scow and tug to the offshore placement site – a round trip of about 132 miles[4]. ***Table 8*** summarizes the relevant characteristics of the equipment that will be used to dredge the channels and transport the dredged material to Whaler Island and HOODS. ***Table 9*** provides the emission factors that were used to calculate total emissions related to the construction equipment. ***Table 10*** provides the calculated pollutant emissions that are expected due to maintenance dredging and transport of the dredged material to placement sites.

Table 8. Dredging and transport equipment – key data and variables

Equipment	Engine Brake Horse Power	Load Factor	Capacity (cy/hr)	Volume (cy)	Operating Time (Hours)
Hydraulic Dredge	2,500	0.51	600	101,000	168
Booster Pump	500	0.51	600	101,000	168
Tender	900	0.38			51
Survey Boat	300	0.38			34
Mechanical Dredge	500	0.51	300	71,000	237
Tender	900	0.38			71
Survey Boat	300	0.38			47
Haul Barge[1]	3,000	0.68			195

[1] Assumptions: speed = 10 mph, round trip distance = 132 miles, and barge capacity = 4,000 cy

[4] HOODS is located 66 miles from Crescent City and will require a 132 mile round trip for transport of dredged material.

Table 9. Dredging and transport equipment – emission factors

Equipment	Adjusted Emission Factors in g/bhp-hr								
	ROG	CO	NO_x	SO_x	PM_{10}	$PM_{2.5}$	CO_2	CH_4	N_2O
Hydraulic Dredge	1.8	1.1	2.5	0.01	0.11	0.2	570	0.05	0
Booster Pump	1.8	1.1	2.5	0.01	0.11	0.2	570	0.05	0
Tender	1.7	3.9	16.3	0.01	0.7	0.6	670	0.15	0.02
Survey Boat	0.8	3.8	4.9	0.01	0.2	0.2	670	0.08	0.02
Mechanical Dredge	0.2	1.1	2.5	0.01	0.11	0.2	570	0.05	0
Tender	1.7	3.9	16.3	0.01	0.7	0.6	670	0.15	0.02
Survey Boat	0.8	3.8	4.9	0.01	0.2	0.2	670	0.08	0.02
Haul Barge	1.8	1.1	2.5	0.01	0.11	0.2	570	0.05	0

Table 10. Maintenance dredging and transport of dredged material criteria emissions

Equipment	Air Emissions (tons/year)								
	ROG	CO	NO_x	SO_x	PM_{10}	$PM_{2.5}$	CO_2	CH_4	N_2O
Hydraulic Dredge	0.43	0.26	0.59	<.01	0.03	0.05	134.85	0.01	<.01
Booster Pump	0.09	0.05	0.12	<.01	<.01	<.01	26.97	<.01	<.01
Tender	0.03	0.07	0.31	<.01	0.01	0.01	12.76	<.01	<.01
Survey Boat	<.01	0.02	0.02	<.01	<.01	<.01	2.83	<.01	<.01
Mechanical Dredg	0.01	0.07	0.17	<.01	<.01	0.01	37.92	<.01	<.01
Tender	0.05	0.10	0.44	<.01	0.02	0.02	17.93	<.01	<.01
Survey Boat	<.01	0.02	0.03	<.01	<.01	<.01	3.99	<.01	<.01
Haul Barge	0.79	0.48	1.10	<.01	0.05	0.09	249.94	0.02	<.01
Total	**1.39**	**1.09**	**2.77**	**<.01**	**0.11**	**0.18**	**487.19**	**0.03**	**<.01**

4.2.3 Mitigation

The air pollutant emissions expected to result from maintenance dredging and transport of dredged material are less than the general conformity *de minimus* thresholds presented in ***Table 7***. Therefore, there would not be a significant impact on air quality as a result of the Proposed Action.

4.3 Biological Resources

This section covers both terrestrial and aquatic habitats and species. Aquatic resources are those resources in both marine and riverine environments. Special status species and habitats are covered in ***Section 4.11***.

4.3.1 Affected Environment

Crescent City Harbor and the proposed dredged material placement sites are home to a number of fish and wildlife species as well as a variety of habitat communities. This section describes the biological resources and habitats within the study area. Further discussion of threatened and endangered species and protected habitats is included in ***Section 4.11***. Wetlands and waters of the United States are discussed further in ***Section 4.13***.

4.3.1.1 Terrestrial Environments and Organisms

The terrestrial environments of the study area include upland areas associated with Crescent City Harbor and upland environments within Whaler Island.

Crescent City Harbor- Terrestrial Habitats and Species

For the purposes of this assessment, consideration of the terrestrial environment is limited to areas within and adjacent to Crescent City Harbor. These areas include developed areas, grass-covered park areas, sandy beaches, reinforced shorelines and breakwaters, and rock outcroppings. While moderately to highly disturbed, these areas support a variety of species, and serve as a transitional habitat from the terrestrial to marine environments. Upland habitats with higher biological value within this area include the sandy beaches and intertidal flats associated within Crescent City Harbor and South Beach which extends south from the Whaler Island jetty.

Sandy Beaches / Dunes

Beach and Dune areas occur within the Project Area above normal high tide lines within Crescent City Harbor and to the south of Whaler Island at South Beach. Sandy beach habitat includes dry backshore areas that are characterized by lower productivity than the adjacent intertidal habitat, but which provide primary habitat for a variety of species. Sandy well drained soils are the defining factor of this habitat community along with associated vegetated dunes. Plant species in these exposed coastal environments are adapted to strong winds, waves, and salt spray and often include native and non-native grasses, herbaceous vegetation and coastal shrub species such as beach bur (*Ambrosia chamissonis),* gumweed (*Grindelia Willd.)*, sealavender (*Limonium P. Mill).,* and wild radish (*raphanus sativa),* as well as non-native plants like iceplant (*Carpobrotus chilensis)* and sea rocket (*Cakile maritime).* While some sandy beach and dune areas in the vicinity of the project are disturbed by development, such

habitat supports species of invertebrates; provides forage, resting, and nesting habitat for a variety of shorebirds, diving birds, gulls, terns, wading birds and waterfowl; and supports butterflies and other insects as well as small mammals.

Intertidal flats

The intertidal zone, also known as the foreshore, is the area between mean lower low water (MLLW) and mean higher high water (MHHW) that is alternately exposed during low tides and inundated during high tides. Sandy intertidal zones are characterized by soft bottom sands, shells, and occasionally cobble in the area between the highest and lowest tides. As a transitional zone between upland and marine environments, intertidal flats are of high biological productivity and value, serving as breeding and feeding grounds for anadromous fish, marine fish, shorebirds and other seagoing birds, and both marine and terrestrial mammals (such as river otters). The sandy intertidal zone also provides important habitat for various organisms living under the surface of the sand, including clams, crabs, and other vertebrates and invertebrates.

Whaler Island - Terrestrial Habitats and Species

Whaler Island is a 5.5-acre promontory within Crescent City Harbor. Its northern face (Harbor-side) is primarily composed of sparsely vegetated native rock outcroppings with scrub-shrub and a few small conifer trees at the pinnacle of the rocks. The outcropping is artificially reinforced on the eastern, western, and northern ends. A roadway connects the island to the mainland and is protected with large rip-rap armoring. The larger southern face of the island is relatively unaltered. The island is subject to winds and wave erosion. Though small in size, Whaler Island may be inhabited at various times of the year by nesting birds (migratory and resident) and seals and sea lions.

4.3.1.2 Aquatic Environments

The aquatic environments found in the study area in Crescent City Harbor and the proposed dredge placement locations include freshwater riverine, shallow water estuarine, nearshore marine and open-ocean environments.

Crescent City Harbor – Aquatic Habitats and Species

Estuarine

The estuarine environment, the brackish mixing zone within the Harbor, can be broken into two main zones: the subtidal zone and the permanently inundated deeper waters. Estuaries, including suabtidal areas, provide important habitat for numerous aquatic species. Estuaries also provide critical ecosystem services, including water filtration in intertidal environments,

protection and stabilization of shorelines and storm surge buffering, as well as high value habitat for organism breeding, rearing, feeding, and migration.

The nearshore subtidal zone experiences high wave energy and is generally occupied by small, mobile, deposit-feeding crustaceans and contains fewer species of invertebrates than in the finer sandy to mixed sediments offshore. Subtidal estuarine waters provide foraging and habitat for fish such as shiner surfperch (*Cymatogaster aggregate),* Starry flounder (*Platichthys stellatus),* and various smelt and sculpin species. Marine birds utilize open water estuarine and ocean habitat primarily for resting on the surface and diving for submerged food. Benthic habitat in nearshore marine areas is generally occupied by invertebrates such as polychaete worms (including *Mediomastus californiensis* and *Polydora kempi*), anemones, shrimp (*Neomysis rayii, Bathyleberis sp.,* and *Euphilomedes carcharodonta*), crabs (including *Hemigrapsus nudus)*, bivalves (including *Macoma secta* and *Transennella tantilla*), Seastars (including *Amphiodia sp.*), and gammarid amphipods (including *Aoroides columbiae* and *Corophium acherusicum*), among other sessile and suspension feeding organisms.

Submerged aquatic vegetation often colonizes estuarine and nearshore environments and eelgrass (*Zostera marina*), a native estuarine aquatic grass can be found in shallow-water estuarine areas Crescent City Harbor. Eelgrass is an aquatic plant that extends long rhizomes (roots) an average of 1.5 – 8 inches below the substrate from which the turions (stems) sprout with long, green blades (leaves). Eelgrass thrives in protected coastal waters with sandy or muddy bottoms where it forms dense mats of vegetation. Eelgrass provides important breeding, feeding and rearing habitat for aquatic fish and organisms. For out-migrating salmonid smolts, eelgrass provides important shelter and foraging habitat. Eelgrass also provides cover and foraging grounds for juvenile fish and in some locations, serves as a spawning ground for species such as herring. In addition, some bird and other species feed almost exclusively on eelgrass. It is unknown how extensive the eelgrass communities historically were in what is today Crescent City Harbor. However, patches of eelgrass remain within the shallow areas of the harbor. Due to previous dredging and the depth of the federal channels, eelgrass is unlikely to occur within the channel boundaries where maintenance dredging would occur.

The most common marine mammals in Crescent City Harbor are harbor seals (*Phoca vitulina*) and California sea lions (*Zalophus californianus)*. Harbor seals generally forage near the shore in water that is up to 5 meters (16 feet) deep. Both seals and sea lions often haul out on docks in the harbor. Several species of whales and porpoises are commonly found in open ocean marine waters along the California coast (including gray whale (*Eschrichtius robustus*), humpback whale (*Megaptera novaeangliae*), blue whale (*Balaenoptera musculus*), and harbor porpoise (*Phocoena phocoena*) but are less likely to occur in the nearshore project action area.

Riverine

Elk Creek is a freshwater tributary that discharges under Highway 101 into Crescent City Harbor near the center of the Harbor's shoreline. The headwaters of Elk Creek originate in the Jedediah Smith Redwood State Park while the lower middle reaches flow through a large forested and emergent wetland complex of Crescent City Marsh. Elk Creek then passes under Highway 101 through a 500-feet long box culvert to a short stretch of the creek's estuarine environment, subject to daily tidal inundation. Urban, residential, and industrial development within the Elk Creek Valley has resulted in a major impact on aquatic habitat and most of the coastal wetlands and estuarine rearing habitat that might have existed in the lower basin at one time has been dredged, channelized, and/or filled (NMFS 2014). However, Elk Creek still maintains native and anadromous fish, including coho salmon (NMFS 2014).

Whaler Island – Aquatic Habitats and species

Whaler Island is surrounded by estuarine and marine waters of the harbor, and is subject to daily tidal and wave influences. As described above for Crescent City Harbor aquatic habitats, the nearshore subtidal habitats areas of the island support a variety of intertidal marine species, as well as serving as occasional forage grounds for smaller marine mammals, shorebirds and other seagoing birds.

Humboldt Open Ocean Disposal Site (HOODS)

The HOODS placement site is an existing open-ocean sediment placement site located 66 miles south of Crescent City Harbor, approximately 3 to 4 nautical miles offshore from Eureka, CA in water depths of approximately 160-180 ft. The HOODS site has been used periodically as an interim dredged material placement site since September 1990. USEPA prepared an EIS in 1995 (USEPA 1995) for designation of the placement area. The Site Management and Monitoring Plan (SMMP) was updated in 2006. Placement of dredged material from the 2019 maintenance dredging of Crescent City would be performed in compliance with the SMMP. Impacts of placement of dredged material at HOODS are addressed in the 1995 EIS; Crescent City dredged material will be placed in compliance with the SMMP. Therefore, impacts of placing dredged material from Crescent City at this site are not addressed in this EA.

4.3.2 Environmental Consequences

4.3.2.1 No Action Alternative

Under the No Action Alternative, no additional federal maintenance dredging would occur. Therefore, no change to terrestrial or aquatic environments or effects to species utilizing these environments would occur under the No Action Alternative.

4.3.2.2 Proposed Action

Under the Proposed Action, dredging of Crescent City Harbor's federal channels and placement of dredged material at Whaler Island placement site and HOODS would occur. As discussed above, impacts of placing dredged material from Crescent City at the HOODS site are not addressed in this EA as they are addressed by the 1995 EIS and would be in accordance with the SMMP. Additionally, impacts to special status species and habitats are discussed in ***Section 4.11*** of this EA as opposed to this section.

Aquatic Habitats and Species

In general, both dredging and material placement activities have the potential to adversely affect aquatic habitat and organisms. Potential impacts to aquatic environments associated with the Proposed Action include alteration of the nearshore and benthic aquatic environments and disturbance of aquatic species within the area to be dredged and within the Whaler Island placement area. Dredging activities remove soft bottom habitat and can thus cause removal/burial of benthic invertebrates, demersal fish eggs, or nonmotile larvae; altered water quality (e.g. turbidity, suspended sediment) leading to reduced visibility or clogging of fish gills; damage to submerged aquatic vegetation habitats; increased water depth resulting in a decrease in primary productivity; and/or damage to fishery or spawning grounds (SAIC, 2007). Potential aquatic habitat impacts associated with dredging vessels and equipment may include disturbance of seafloor surfaces from vessel anchors, disturbance of organisms due to increased movement and noise, and temporary displacement of mobile organisms. With hydraulic dredging and material pumping, pipeline placement, anchoring and/or removal also has the potential to damage aquatic habitats, crush sedentary organisms, or interfere with wildlife movement through habitat (SAIC, 2007). Effects to aquatic species may occur through direct contact with equipment or placed material as well as indirectly through effects on water quality and noise levels associated with dredging and placement activities.

Dredging and placement activities associated with the Proposed Action are likely to result in temporary, minor impacts to aquatic habitats and organisms in the action areas, but such impacts are not expected to be significant. Effects on water quality are discussed in **section 4.7.2.2**. Water quality effects from dredging and placement activities that may indirectly effect aquatic species and habitats include temporary, localized increases in turbidity and the potential for increased concentrations of dissolved chemicals and metals as well as lowered dissolved oxygen levels or changes in temperature or pH due to resuspension of sediment and sediment-bound organic material. Such effects would be temporary, generally confined to the dredging and placement area, and would return relatively quickly to background levels following dredging and placement activities (Jones and Lee 1978; LaSalle 1990; Lee et al. 1978; Simenstad 1988). For example, dredged material placement studies have demonstrated

turbidity levels returning to background conditions typically within about an hour (Jones and Lee 1978; Lee et al. 1978; Simenstad 1988), with contaminants released or taken up during placement typically following the turbidity pattern (Lee et al. 1978). Moreover, hydraulic dredging (i.e., hopper and cutterhead-pipeline dredges) generally reduces disturbance and resuspension of sediments at a dredging site compared to mechanical dredges. Studies show that turbidity plumes at placement sites last only 20 minutes, and plume duration is even less during placement of sandy material, because coarse sediments settle out of the water column more quickly than fine sediments (LTMS, 1998). Increased turbidity from dredging and placement activities is expected to have a negligible effect on plankton productivity and other benthic dwelling species.

Dredging in the federal channels will result in removal of soft bottom sediment in subtidal benthic habitat and potential removal or temporary burial of benthic invertebrates and non-motile organisms. Any anchoring impacts to benthic habitat and organisms associated with the dredge equipment in aquatic habitat would likely be equivalent to existing anchoring impacts in the action area given the frequent vessel traffic. Moreover, SAIC (2007) suggest that anchor damage is likely to be less substantial on sandy seafloors like those associated with the proposed dredging area. As described for Essential Fish Habitat in ***Section 4.11.2.2***, recovery of benthic habitat and recolonization by most benthic organisms would be expected occur by the following season. Fish and shellfish organisms are most sensitive to water quality or removal/burial impacts during early life-history stages, such as the egg and larval stages as they have limited capability to avoid direct disturbance and water quality changes. Yet, the location of disturbance will change as the dredge moves and potential exposure durations of benthic and sessile organisms at a stationary point in or near the dredge footprint would be expected to be only on the order of one to a few days using a cutterhead hydraulic pipeline or clamshell dredge (SAIC, 2007). Moreover, because the material to be dredged is primarily sand, any suspended sediment would be expected to settle out quickly and be unlikely to significantly reduce visibility or clog fish gills for long periods.

Movement, visual disturbance, and operational noise from dredge equipment could cause marine mammals, fish, and birds to avoid close proximity to the dredging action area. The potential for noise impacts to affect species is discussed in ***Section 4.9.*** Given the mobility of marine mammals, fish, and birds, the frequent vessel traffic in the project area under ambient conditions, the short dredging duration likely to be associated with the Proposed Action, and the abundance of similar habitat conditions around the dredging and placement site, significant adverse effects from dredge noise, movement, and visual disturbance are not expected.

Additionally, while eelgrass can be adversely impacted by direct contact with dredging operations or indirectly by shading from turbidity, dredging and placement activities would not

be expected to significantly impact eelgrass as eelgrass is not expected to be present within the deep and regularly disturbed federal channels or at the Whaler Island placement site.

Thus, effects to aquatic habitats and species from dredging and placement activities associated with the proposed action are expected to be temporary, short in duration, and less than significant.

Terrestrial Habitats and Species

The proposed dredging and placement activities would take place in the aquatic environment and thus dredging activities would not be expected to impact terrestrial habitat and organisms in the action area. However, the USFWS has expressed concern about aggradation of sand at the north end of South Beach as described in a letter from USFWS to the CCC dated November, 2009 and two letters dated December 21, 2010 (***Attachments to Appendix A***). The concern is that aggrading sand along South Beach from placement of material at the Whaler Island placement site is impeding flow through the culverts under Highway 101 that drain the wetland areas where the federally listed Western lily (Endangered) has been documented to occur This matter is discussed further in ***Sections 4.11 and 4.13*** and measures to avoid significant effects are proposed. Thus, any effects to terrestrial habitats or species from the Proposed Action would be less than significant.

4.3.3 Mitigation

The impacts of the Proposed Action on biological resources would be less than significant and would not require mitigation.

4.4 Cultural Resources

The following definitions are common terms used to discuss the regulatory requirements and treatment of cultural resources:

Cultural resources is the term used to describe several different types of properties: prehistoric and historical archaeological sites; architectural properties such as buildings, bridges, and infrastructure; and resources of importance to Native Americans or other groups of people.

Historic properties is a term defined by the National Historic Preservation Act (NHPA) as any prehistoric or historic district, site, building, structure, or object included in, or eligible for inclusion on, the National Register of Historic Places (NRHP), including artifacts, records, and material remains related to such a property.

Historical resources as described in the California Environmental Quality Act (CEQA) includes buildings, sites, structures, objects, or districts, each of which may have historical, prehistoric,

architectural, archaeological, cultural, or scientific importance, and is eligible for listing or is listed in the California Register of Historical Resources (CRHR) or a local register of historical resources. The CRHR includes resources listed in, or formally determined eligible for listing in the NRHP, as well as some California State Landmarks and Points of Historical Interest.

Paleontological resources include fossilized remains of vertebrate and invertebrate organisms, fossil tracks and trackways, and plant fossils. A unique paleontological site would include a known area of fossil-bearing rock strata.

The Area of Potential Effects (APE) is defined as the geographic areas of an undertaking where changes to historic properties may occur, if such properties are present. The APE would include the areas subjected to dredging and the placement areas. The APE consists of the horizontal and vertical limits of the project site, and includes the area within which adverse effects to Historic Properties could occur as a result of the undertaking. The horizontal APE consists of all areas where activities associated with the undertaking are proposed. The vertical APE is described as the maximum depth below the surface to which excavations will extend. The vertical APE includes all subsurface areas where archaeological deposits could be affected. Also included in the APE are the dredged material placement sites.

Regulatory Authority

Cultural resources are addressed by a number of laws, regulations, executive orders, programmatic agreements and other requirements. The principal federal law is the NHPA of 1966, as amended (16 USC 470 et seq.), and implementing regulations (36 CFR 800) that describe the process for identification and evaluation of historic properties, assessment of the effects of federal actions on historic properties; and consultation to avoid, reduce, or minimize adverse effects.

The NHPA of 1966, 80 Stat. 915, 16 U.S.C. 470 et seq., as amended, authorizes the Secretary of the Interior to maintain a National Register of districts, sites, buildings, structures, and objects significant in American history, architecture, archeology, engineering and culture. The regulations set forth the procedures and requirements for listing properties on the NRHP.

The NRHP is the nation's master inventory of known historic resources. The NRHP is administered by the National Park Service and includes listings of buildings, structures, sites, objects, and districts that possess historic, architectural, engineering, archaeological, or cultural significance at the national, state, or local level. Structures, sites, buildings, districts, and objects over 50 years of age can be listed in the NRHP as significant historic resources. However, properties under 50 years of age that are of exceptional importance or are

contributors to a district can also be included in the NRHP. The criteria for listing in the NRHP include resources that:

a) are associated with events that have made a significant contribution to the broad patterns of history;
b) are associated with the lives of persons significant in our past;
c) embody the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction; or
d) have yielded or may likely yield information important in prehistory or history.

Section 106 of the NHPA also requires an APE map, as described in Title 36 CFR 800.4(a)(1). The APE is the geographic area within which changes in the character, or use of an historic property could occur. Typically an archaeological APE includes any area where project activities could affect the ground surface, either through excavation or deposition. NHPA regulation CFR 800.4(d) stipulates that, when an agency finds that there are no historic properties present, the agency will make a "no historic properties affected" determination.

Section 106 of the NHPA, the American Indian Religious Freedom Act of 1978, and Executive Order 13175 of November 6, 2000 (Consultation and Coordination with Indian Tribal Governments), all require that government agencies consult with Native Americans to determine their interests in federal government. Such consultation would take place as the project moves forward.

NEPA is the broad environmental law that applies to federal agencies and their activities. NEPA specifies that it is the continuing responsibility of the federal government to use all practicable means, consistent with other essential considerations of national policy, to improve and coordinate federal plans, functions, programs, and resources to preserve important historic, cultural, and natural aspects of our national heritage. Cultural resources preservation is included as part of the general policy of environmental protection, and NEPA requires that cultural resources be considered in the preparation of NEPA documents.

4.4.1 Affected Environment

The project area is located within the ethnographic territory of the Tolowa, a group of the Athapascan language family. The Tolowa extended along the coastal strip southward from Smith River to below Crescent City where Yurok territory began (Moratto 1984).

A records search was conducted at the Northwest Information Center on February 10, 2015 (NWIC File No. 14-0915). The literature review included, but was not limited to, the National Register of Historic Places, the California Inventory of Historic Resources, California Historical

Landmarks, locally-listed historic buildings and sites. No prehistoric or historic cultural resources/historic properties were identified within the project APE. Two resources were identified outside of the project APE, but within a .25 mile radius of the project.

The California State Lands Commission maintains a database of known shipwrecks. In addition, the National Park Service maintains lists of shipwrecks determined to be listed or determined eligible for the NRHP. These databases were searched for any known shipwrecks located in the APE. No shipwrecks on the NRHP are located in the project area. Several shipwrecks are located in Crescent City Harbor, and one is located near the mouth of the harbor (CSLC 2016, NPS 2016).

4.4.2 Environmental Consequences

4.4.2.1 No Action Alternative

Under the No Action Alternative, no additional federal maintenance dredging would occur and shoaling would continue. Therefore, no impacts to cultural resources would occur under the No Action Alternative.

4.4.2.2 Proposed Action

No prehistoric or historic cultural resources/historic properties were identified within the project APE and no shipwrecks were identified as existing in an area that would be affected by the project. The project area has been extensively disturbed by past dredging activities and previous navigation improvements. Inasmuch as no culturally-significant properties have been identified within the APE, and repeated episodes of maintenance and "new work" dredging over the past 84 years have failed to turn up submerged cultural resources, USACE has determined that an additional cultural resources investigation is unwarranted at this time and that the Proposed Action would have no effect on historic and cultural resources. Minimization Measure (MM) CR-01 described below will be implemented to prevent effects from inadvertent discovery of cultural or historical resources.

4.4.3 Mitigation

Given the absence of know historic or cultural resource in the project area and the disturbed nature of the existing federal channel no effect to cultural or historic resources is expected. MM-CR-01 is proposed to avoid effects due to inadvertent discovery of such resources.

MM-CR-01: If an inadvertent discovery is made USACE would immediately halt all soil- and sediment-disturbing activities within the area of the find, as appropriate. Prehistoric cultural material includes, but is not limited to: chert or obsidian flakes, projectile points, mortars, and pestles, dark friable soil containing shell and bone dietary debris, heat-affected rock, human burials, shell midden deposits, hearth remains, and stone and/or shell artifacts. Historic

material that may occur within aquatic environments, includes but is not limited to, ship remains, maritime-related structures and remains with square nails, whole or fragmentary ceramic, glass or metal objects, wood, nails, brick, anchors, barge remnants, dumpsites, or other materials. A USACE archaeologist or other qualified archaeologist would then ascertain the nature of the discovery, the significance of the find, and provide proper management recommendations.

4.5 Geology, Sedimentation, and Seismicity

4.5.1 Affected Environment

4.5.1.1 Geology

Crescent City Harbor lies adjacent to the Northern Coast and Klamath mountain ranges and within the Smith River Plain, an approximately 100-square-mile, rectangular-shaped coastal lowland (***Figure 7***). The harbor lies on the southern edge of a broad, low-relief marine terrace that is part of the North Coast Ranges geologic province. The harbor bedrock consists of sedimentary rocks of the Miocene St. George formation, marine sand and shale, and metamorphic and sedimentary rocks of the Cretaceous to Jurassic-aged Franciscan Complex, predominately Franciscan mélange and Franciscan sandstone in the project area. Overlying the bedrock is a terrace deposit composed of Pleistocene compacted marine sands and clays of the Battery formation. Geologically recent unconsolidated sand dunes and alluvial deposits are deposited thinly over these formations (Back 1957, Toppozada et al. 1995, USACE 2006, CGS 2012).

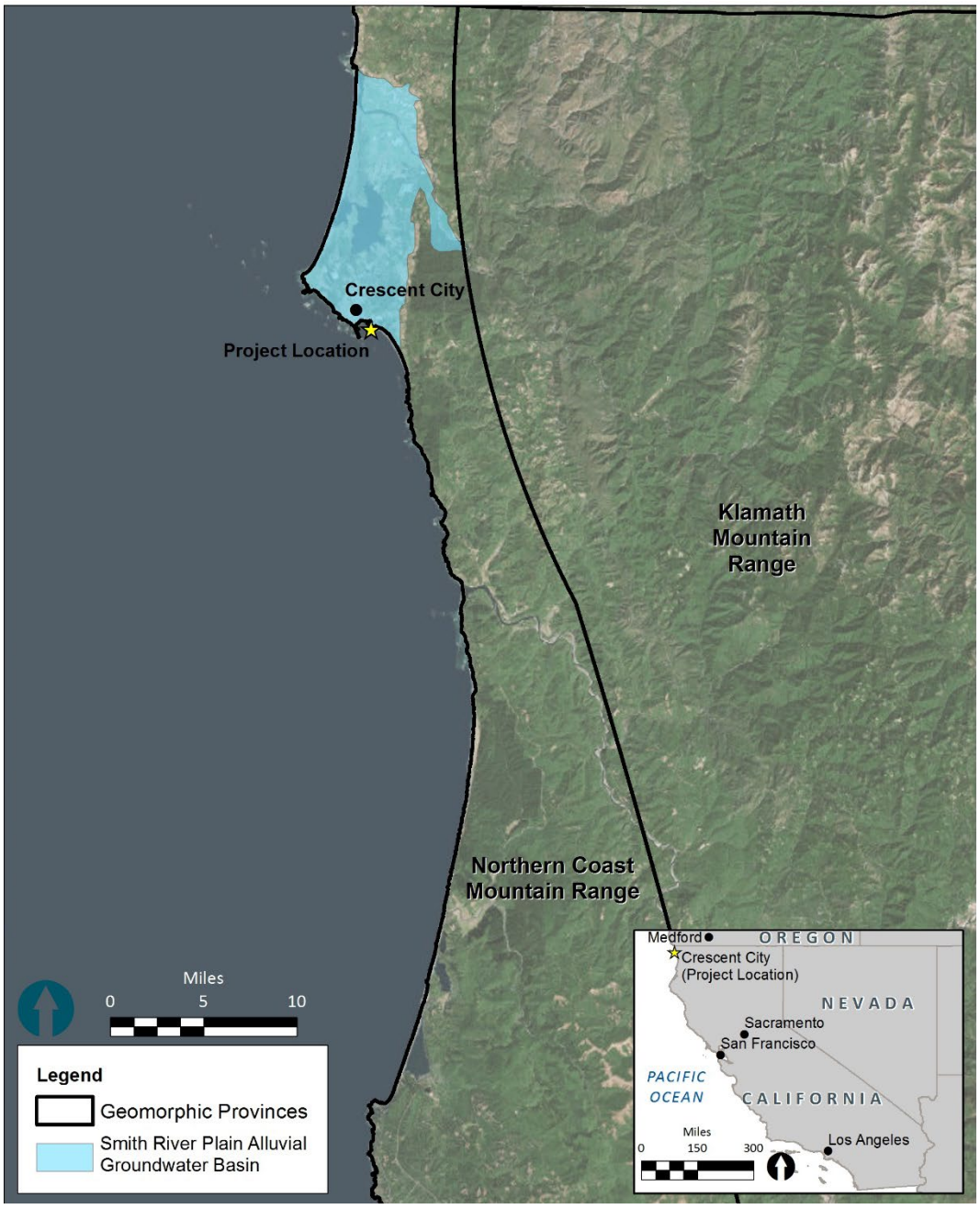

Figure 7. North Coast Hydrologic Region and Geomorphic Provinces

4.5.1.2 Sediment

The majority of deposited sediments in Crescent City Harbor are sourced from littoral transport of sediments into the harbor from the north and south. Composition of the sediment sources

from north to south are fairly similar, with approximately equal (30% to 45%) proportions of rock fragments and quartz. Mean grain sizes range from fine to medium sands with a large range in sediment size distribution, from very well sorted (i.e., very poorly graded) to very well graded (i.e., very poorly sorted) (USACE 2006).

Sediment samples from the Crescent City Harbor federal channels have been subjected to a comprehensive suite of physical, conventional, and chemical analyses and biological tests based on applicable guidelines established in the Inland Testing Manual (USEPA/USACE 1998), the Ocean Testing Manual (USEPA/USACE 1991), and the Upland Testing Manual (USACE 2003).

Previous sampling events (1993, 1998, 2003, 2009, 2011, and 2018) indicate that dredged material from the Entrance Channel has predominantly consisted of sand with little organic matter, while dredged material from the Marina Access Channel has predominantly consisted of sand with moderate organic matter and dredged material from the Inner Harbor Basin Channel has predominantly consisted of fine grain material (silt) with high amounts of organic matter. The percent sand and total organic carbon (TOC) of sediment dredged from the Crescent City Harbor federal channels in the past are presented in ***Table 12***.

Table 11. Dredged material grain size and TOC composition

Dredge Area	Entrance Channel		Inner Harbor Basin Channel		Inner Harbor Basin and Access Channels[1]		Marina Access Channel	
Date	**% Sand**	**% TOC**	**% Sand**	**% TOC**	**% Sand**	**% TOC**	**% Sand**	**% TOC**
1993	94	0.1	49	5.6	--	--	--	--
1998	72	1.2	34	8.7	--	--	--	--
1999	--	--	--	--	88.9	6.04	--	--
2003	--	--	--	--	76	1.81	--	--
2009	87.4	0.8	46.4	10.8	--	--	80.0	6.1

Note: 1. Samples from the Inner Harbor Basin and Marina access channels were composited and analyzed.

4.5.1.3 Seismic Hazard

Crescent City Harbor resides in a moderately active seismic area on the leading edge of the North American Plate, approximately 50 miles east of the surface trace of the Cascadia Subduction Zone. The Cascadia Subduction Zone is approximately 750 miles long, extending from the Mendocino fracture zone to the Queen Charlotte transform fault off the shore of British Columbia. Regional seismicity is dominated by the subduction of the Gorda Plate underneath the North American Plate. Seismic activity is most likely to occur within the Gorda

Plate. No active faults or fault zones are located immediately within the project site, and the closest active fault zone is the Little Salmon Fault located 112 miles away. This tectonic setting is very different than the more seismically active and well-known San Andreas Fault system to the south (Tucker 1981, Toppozada et al. 1995).

Other hazards associated with seismic activity, in addition to ground shaking and fault rupture, include landslides, liquefaction, and tsunamis. The harbor is at low risk for landslide or slope failure hazard due to the low relief of the area. Despite being flat land with a relatively high water table, the harbor exhibits low liquefaction potential because it is underlain by sedimentary or metamorphic rock or compacted marine sediments. The tsunami hazard in Crescent City Harbor is significant based on the historical record, which includes over 32 tsunamis since the tide gauge was installed in 1933. At least 12 of these produced run-up exceeding 1 meter and 5 caused serious damage, including the 1964 Alaskan tsunami which produced a 21-ft wave, caused $15 million of damage, and killed 10 people (Dengler et al. 2008; Tucker 1981, Toppozada et al. 1995).

4.5.2 Environmental Consequences

4.5.2.1 No Action Alternative

Under the No Action Alternative, there would be no federal maintenance dredging in Crescent City Harbor. Existing geologic, seismic, and sediment conditions would remain consistent with baseline conditions; however, littoral transport of sediment would cause continued deposition and shallowing of the navigation channels. There would be no impact on geology and sediment under the No Action Alternative.

4.5.2.2 Proposed Action

The Proposed Action includes maintenance dredging of the federal channels, which would restore shoaled areas to their design depths. The Proposed Action would not have the potential to expose people or structures to substantial adverse geological effects including rupture of a known fault, creation of unstable slopes, increase in the amount of liquefaction-prone unconsolidated material in the project area, or change in the design of the inner boat basin to affect its resistance to a 50-year tsunami event. Therefore, impacts of the Proposed Action on geology and sediments would be less than significant.

4.5.3 Mitigation

The impacts of the Proposed Action on geology, sedimentation, and seismicity would be less than significant and would not require mitigation.

4.6 Hazardous Materials and Contaminants

4.6.1 Affected Environment

The Crescent City Harbor consists of docks, mooring space, a marine repair facility, a USCG station, and other auxiliary commercial and recreational facilities. Hazardous materials known, or thought to occur at the project site include those associated with its marine functions and include lead-based paint, asbestos-containing materials, and treated piles (creosote or other chemicals). Newer portions of the harbor, including the recently rebuilt inner boat basin, are less likely to contain these hazardous materials. Harbor operations require routine use, transport, or placement of potentially hazardous materials, such as gasoline, diesel fuel, cleaners, and solvents.

Crescent City Harbor operates in compliance with existing hazardous materials regulations, including complying with the USEPA's hazardous waste manifest system requirements for all hazardous waste transported in connection with operational activities; complying with requirements associated with hazardous wastes produced on site, including proper storage, labeling, and accumulation time limits; use of certified hazardous waste transportation companies and permitted facilities for any hazardous waste transport, treatment, storage, recycling, or placement.

According to a search of the California Department of Toxic Substances Control (DTSC) EnviroStor and the State Water Resources Control Board GeoTracker database websites (DTSC 2007; SWRCB 2015), there is a single listed open cleanup site within a 0.5-mile radius of Crescent City Harbor and Whaler Island. The open cleanup site is the Whiteley, Thomas J., Inc., drinking water well (Regional Board Case No. 1NDN009) located approximately 0.25 miles east of the harbor, which may be contaminated with diesel, gasoline, kerosene, or other petroleum.

As described above in Section 4.5.1.2, sediment samples from the Crescent City Harbor federal channels have been previously sampled for sediment chemistry and toxicity. The data indicate that sediment from all three channels has met criteria specified by the various placement options (upland or ocean; AET 2003, USACE 2006, ADH 2009, USACE 2019) with the Entrance Channel predominantly consisting of sand with little organic matter, the Marina access channel has predominantly consisting of sand with moderate organic matter, and the Inner Harbor Basin Channel predominantly consisting of fine grain material with high amounts of organic matter (***Table 12***).

4.6.2 Environmental Consequences

4.6.2.1 No Action Alternative

The No Action Alternative would consist of no additional federal maintenance dredging. There would therefore be no change in the existing risk of mobilizing contaminants present in

sediments, and there would be no potential impacts from accidental spills during construction. Crescent City Harbor operations would be unchanged from present conditions, although continued shoaling will impede navigation and reduce the harbor's functional capacity. This may result in a proportional decrease in the use of potentially hazardous materials associated with harbor operations, including use of gasoline, diesel fuel, cleaners, and solvents, due to reduced vessel traffic and associated activities. Use of these materials would continue to occur in compliance with applicable hazardous materials regulations, and potential hazardous materials impacts from operations would be largely unchanged from existing conditions. The No Action Alternative would not interfere with any ongoing management of listed hazardous materials sites, including the Whiteley, Thomas J., Inc., drinking water well. Consequently, there would be no impact on hazardous materials under the No Action Alternative

4.6.2.2 Proposed Action

The Proposed Action would not alter or expand operations at Crescent City Harbor; facility operations would be similar to existing operational conditions. Existing infrastructure potentially containing hazardous materials (i.e., creosote-treated piles, asbestos containing materials, etc.) would be unaffected by the Proposed Action.

Accidental spills of oil, grease, or other petroleum products could occur during construction, as dredging includes operation of heavy machinery. The potential risk associated with the use of these products does not differ from the baseline conditions in the project area, where vessels navigate the waterways and vehicles access the adjacent upland areas. In order to minimize the risk of accidental spills, the contractor will implement a Spill Prevention, Control, and Countermeasures (SPCC) Plan during all construction activities to contain such products and ensure that the appropriate materials are maintained onsite during construction to respond to any gas, oil, or other leak or spill.

In the past, sediment characterization analyses have consistently confirmed that the sediment from the Crescent City Harbor federal channels is suitable for placement at the historic sites that have been used by USACE or the Crescent City Harbor District. Sediment samples were collected in 2018 from individual cores, composited, and analyzed for physical and conventional parameters (grain size, total organic carbon, sulfides, and total solids); chemical parameters, including the suite of heavy metals, organic compounds, and biological parameters, including water column toxicity, benthic bioassays, and bioaccumulation. From these analyses it was found that the sediments were safe for placement at the proposed placement sites, with no chemical species of interest having concentrations above background levels. Based on the results of these tests, no impacts due mobilization of contaminants from dredging and placement of dredged material are expected from the Proposed Action.

The Proposed Action is not located on a listed hazardous materials site, and it would not interfere with any ongoing management of listed hazardous material sites, including the Whiteley, Thomas J., Inc., drinking water well.

Therefore, effects of the Proposed Action relative to hazardous materials and contaminants would be less than significant.

4.6.3 Mitigation

The impacts of the Proposed Action related to hazardous materials and contaminants would be less than significant and would not require mitigation.

4.7 Hydrology and Hydraulics and Water Quality

4.7.1 Affected Environment

This section discusses hydraulic, hydrology, and water quality conditions in the study area. It includes a discussion of the upland watershed and drainages, tides and currents, harbor circulation, wind waves, and water quality standards for the study area.

Accretion patterns and sedimentation are largely discussed in the Geology, Sedimentation, and Seismicity section (***Section 4.5***). Tsunami hazards, which are related to seismic activity, are also discussed in the Geology, Sedimentation, and Seismicity section. Potential impacts associated with the use of hazardous materials (such as gasoline, diesel fuel, cleaners, and solvents), and mobilization of contaminants in sediments, which may adversely affect water, are discussed in the Hazardous Materials section (***Section 4.6***).

Groundwater supplies or groundwater recharge would not be impacted by the Proposed Action or No Action Alternatives because no municipal wells are located in the general vicinity of the study area. The project entails dredging and placement of dredged material, which would have no effect on flood hazards. Therefore, flood conditions and groundwater are not addressed in this document.

4.7.1.1 Hydrology and Hydraulics

Upland Watershed and Drainages. Crescent City is located within the Lake Earl and Jordan Creek watershed. Drainage from the city flows through Lake Earl and Jordan Creek, in addition to other minor drainages, before discharging to the Pacific Ocean. Other minor drainages include Elk Creek, the mouth of which is within the Crescent City Harbor (City of Crescent City 2001). Elk Creek contributes sediment deposition to Crescent City Harbor, although this is believed to be a relatively minor source of sediment (HydroPlan and Anchor QEA 2015).

Although Elk Creek is considered to be a high quality fisheries stream, local drainages convey urban runoff which can adversely affect water quality.

Crescent City Marsh, located on the opposite side of Highway 101 from the shoreline, provides habitat for the endangered Western lily and has experienced decreased drainage over time. Three discharge culverts which run under Highway 101 directly across from the Whaler Island site and are responsible for draining the marsh have been subject to inhibited flows, such that the USFWS 5-Year Review Summary and Evaluation report (USFWS 2009) determined that decreased drainage was inhibiting the growth of the lily. Inspection of the culverts on February 11, 2015, showed that upland debris had accumulated upstream of the culverts and was inhibiting flow (HydroPlan and Anchor QEA 2015). Additionally, flow through the culverts had eroded a shallow downstream channel across the beach. Therefore, it did not appear that beach sand was inhibiting flow through the culverts at that time. A study of the bathymetry North of Whaler Island site showed accretion of sandy sediments after the 2009 dredging event. The study area extent did not include the areas where the culvert outflows are located, so the fate of these sediments could not be confirmed (Merkel and Associates Inc., 2010).

Tides and Currents. The tides at Crescent City Harbor are mixed semidiurnal tides with a great diurnal range of 6.9 feet and a mean tide level elevation of 3.7 feet MLLW. Tidal datum based on the tidal epoch of February 1983 to December 2001 (and covering tidal measurements from 1960 to 2001) are presented in ***Table 13***.

Table 12. Crescent City Harbor tidal datum

Tidal Datum	Elevation (feet MLLW)
Highest Observed Water Level (1964 Tsunami)	20.72
Highest Observed Tide Level (February 29, 1983)	10.66
Mean Higher High Water	6.87
Mean High Water	6.23
National Geodetic Vertical Datum of 1929 (NGVD29)	3.79
Mean Tide Level	3.74
Mean Sea Level	3.71
Mean Low Water	1.25
North American Vertical Datum of 1988 (NAVD88)	0.38
Mean Lower Low Water	0.00
Lowest Observed Tide Level (June 13, 1991)	-3.42
Lowest Observed Water Level (March 28, 1964 Tsunami)	-9.98

There are several ocean currents far offshore of Crescent City: the California Current, which flows southward throughout the year; the California Undercurrent, which flows northward underneath the California Current; and the northward flowing Davidson Current, which is typically most active in the fall and winter. These currents are generally located seaward of the continental shelf and do not have an effect on nearshore circulation. Local observations indicate a northerly setting flow, which persists outside the harbor entrance throughout the year. Current speed varies seasonally, with maximum speeds typically occurring during the winter months. Current speeds in excess of 1 knot (1.7 feet per second) are not uncommon during the winter (HydroPlan and Anchor QEA 2015).

Harbor Circulation. There are no recent measurements of circulation from within Crescent City Harbor, but circulation within the harbor is believed to be weak due to its sheltered nature. This assumption is supported by limited current measurements taken approximately 1 mile offshore, which show a decrease in speed moving towards the harbor, and by a crude numerical model that showed simple homogeneous flow throughout the harbor during the flood and ebb cycles, as well as eddy formation and confused flow during slack tide. Additionally, local observations from fishing vessels have not indicated any strong currents affecting navigation within the harbor (HydroPlan and Anchor QEA 2015).

Wind Generated Waves. The wave climate offshore of Crescent City Harbor is typical of the Northern California coast, with severe storm waves generated from the northwest to the south. Based on 15 years of buoy data, at a water depth of 150 feet, typical winter waves average 9 feet in height and 12 seconds in period, while summer waves average 6 feet in height and 8 seconds in period. Winter storm waves can exceed 30 feet in height, with wave periods of up to 25 seconds (USACE 2006).

The wave climate adjacent to Crescent City Harbor is milder than in the open ocean, with considerable attenuation of waves from most directions. The exception involves waves arriving from the west-southwest to south-southwest, as a nearby shoal often amplifies waves arriving from this direction by up to 30 percent of deep water wave height (USACE 2006).

4.7.1.2 Water Quality

Water quality factors of concern in Crescent City Harbor and in waters within or adjacent to placement sites include:

- Total suspended solids (turbidity)
- Dissolved oxygen
- Nutrients
- pH
- Salinity

- Temperature

The North Coast Regional Water Quality Control Board (NCRWQCB) issues receiving water limitations and monitoring requirements for water quality parameters during dredging for the project area. For past dredging and placement of material from Crescent City Harbor, water quality certification was established through RWQCB Order R1-2000-59, which includes a Monitoring and Reporting Program that establishes monitoring requirements for turbidity, settleable solids, and toxicity, as well as biological resources.

Water quality sampling was also conducted in the harbor in October 2018 for the latest Sampling and Analysis Report (USACE 2019), including deionized wet tests and modified elutriate testing (MET). Deionized wet tests use water with a neutral pH which is passed through sediments and then analyzed for what dissolution of chemical species is expected should fresh water (e.g. rainwater) were to pass through the sediments. The MET is valuable for determining the potential for decant water from the placement of dredged material to adversely impact receiving waters. All dissolved metals from the MET were reported at concentrations below the water quality objectives of the California Toxics Rule and the USEPA's Section 304(a) criteria for Priority Toxic Pollutants. MET elutriate bioassay results showed that none of the three channel samples exhibited toxicity to the mysid shrimp (*Americamysis bahia*) or were significantly different from the offshore reference site.

4.7.2 Environmental Consequences

4.7.2.1 No Action Alternative

The No Action Alternative would consist of no additional federal maintenance dredging. There would therefore be no effects on hydrology, hydrodynamics, or water quality.

4.7.2.2 Proposed Action

Hydrology. The Proposed Action would not have an appreciable effect on water circulation in the project area. Removal of sediment may slightly increase the volume of tidal exchange in the project area, however this change would be minimal and neutral for existing tidal and current conditions in the project area and therefor would be less than significant. Wind generated wave conditions would not be affected by the Proposed Action.

To analyze and minimize the potential for effects from dredge material placement at the Whaler Island placement site on drainage from the Crescent City Marsh habitat, the USACE has agreed to a one year monitoring plan for the channels from the culverts to the beach (**Appendix A**). The study will include quarterly measurements of five transects in order to measure the longitudinal profile from the three culvert outflows to the ocean, and two transects between the culverts at equidistant spacing. Transects beginning at culvert outflows would follow the centerline of the channel until the beach and would then extend straight toward the ocean,

while the two transects between the culverts will maintain equidistant spacing from Highway 101 until the water's edge. At the terminus of the study, if there is indication that a significant accretion of sand has limited water flow through the culverts then reconsultation will be opened with the Arcata Office of the USFWS to determine how best to mitigate the effect (e.g. cleaning out of culverts). With the monitoring and, if necessary, mitigation to address any blockages at the culverts, the Proposed Action is unlikely to negatively affect drainage at these culverts, and impacts to hydrology would be considered less than significant.

Surface Water Quality. In the short term, construction impacts from dredging and placement activities on water quality can include temporary, localized increases in turbidity; the potential for increased concentrations of dissolved chemicals and metals; lowered dissolved oxygen levels; or changes in temperature or pH due to resuspension of sediment and sediment-bound organic material. Such impacts associated with the Proposed Action would be temporary, generally confined to the dredging area, and would return relatively quickly to background levels following construction (Jones and Lee 1978; LaSalle 1990; Lee et al. 1978; Simenstad 1988). Dredged material placement studies have demonstrated turbidity levels returning to background conditions typically within about an hour (Jones and Lee 1978; Lee et al. 1978; Simenstad 1988), with contaminants released or taken up during placement typically following the turbidity pattern (Lee et al. 1978).

The USACE has initiated consultation for the project with the NCRWQCB for Clean Water Act water quality coverage under the existing Waste Discharge Requirements (RWQCB Order R1-2000-59) associated with dredging and placement of material from the Crescent City Harbor (***Appendix B***). With concurrence from the NCRWQCB, the project will adhere to the water quality thresholds, best management practices (BMPs), and monitoring included in the order. These BMPs include:

- To ensure that contaminants are not accidently introduced into the waterway, the contractor would implement standard erosion and sediment controls and spill prevention and response measures in and around the proposed project area. The contractor responsible for operating the dredging equipment would be responsible for ensuring that such measures are adhered to.
- Floating debris will be removed from the water and disposed of properly.
- All dredged material will be handled and transported such that it does not re-enter surface waters outside of the protected immediate work area.
- Dredging at each project location will continue to be limited to the approved project depth plus overdepth.

- For Mechanical dredging:
  - Multiple horizontal dredge cuts will be taken where a thick horizontal volume needs to be dredged in order to avoid overfilling the bucket and causing spillage.
  - No overflow or decant water will be allowed to be discharged from any barge, with the exception of spillage incidental to clamshell dredge operations.
- For Hydraulic dredging :
  - Pipeline pumps will only be turned on when the cutterhead is on the seafloor or within 3 feet of the seafloor when priming pumps.
  - Cutterhead will be monitored so that it maintains positive contact with the seafloor during suction dredging.
  - effluent monitoring requirements include daily measurements by grab sample for turbidity (as NTU) and settleable solids (as mL/L). Receiving water monitoring would also be collected daily for turbidity.

Vessels would be operated in compliance with all applicable regulations related to the prevention of water pollution by fuel, harmful substances, and accidental discharges. For mechanical dredging, the dredged material would be secured during transport, with precautions in place to minimize any risk of spills.

In addition, in 2018 USACE conducted sampling and testing of the material to be dredged (as described in the Geology, Sediments, and Seismicity section above). These analyses found no contaminated sediments (USACE 2019). Past characterizations similarly did not identify the presence of any contaminated materials that would preclude placement at the proposed placement sites (ADH 2009).

The Proposed Action is unlikely to result in significant water quality impacts from turbidity, release of contaminants into the water column, and would follow BMPs and monitoring protocols to protect water quality. Therefore, impacts to water quality from the Proposed Action are expected to be less than significant.

4.7.3 Mitigation

Impacts of the Proposed Action related to hydrology, hydraulics, and water quality would be less than significant and would not require mitigation.

4.8 Navigation and Navigation Safety

4.8.1 Affected Environment

Crescent City Harbor serves as the only harbor of refuge between Coos Bay, Oregon, and Fort Bragg, California. Harbor traffic primarily consists of commercial fishing vessels, with commercial fishing activities representing 90 percent of the harbor's total commerce. A portion of the commercial fishing fleet consists of transient boats that use the harbor's Outer Boat Basin, which provides temporary moorage space for approximately 20 vessels. An additional 291 slips, ranging in length from 30 to 70 feet, are available in the Inner Boat Basin. A number of docks work in conjunction with the berthing facilities, including Citizens Dock, which is the largest dock and is primarily used for uploading the commercial fishermen's catch and for refueling and loading ice. Other docks include docks A through H, which serve as moorage for boats 30 to 70 feet in length. The harbor also includes two docks with fish processing plants, as well as a marine repair facility.

In addition to fishing and recreational boats, there is one 65-foot-long tourism-based charter boat that frequents the area year round. The USCG also operates an 87 foot patrol boat and a 25-foot auxiliary response boat in Crescent City, and maintains berthing facilities for both vessels at the short dock located directly behind the inner breakwater.

4.8.2 Environmental Consequences

4.8.2.1 No Action Alternative

Under the No Action Alternative, there would be no federal maintenance dredging in Crescent City Harbor. The number of moorings and slips would remain unchanged; however, continued shoaling of the federal channels would compromise navigational safety.

Each of the three federal channels within Crescent City Harbor is authorized to a depth of -20 feet MLLW, with varying maintenance depths: -20 feet MLLW within the Entrance Channel and -15 feet MLLW within the Inner Harbor Basin and Marina Access channels. Based on the hydrographic survey performed for this project in October 2018, depths within large portions of the Entrance Channel are already 2 to 3 feet above authorized maintenance depths, and are as high as 6 to 8 feet above authorized maintenance depths at locations within the Inner Harbor Basin Channel and the Marina Access Channel (USACE 2019). Continued shoaling within the channels would further limit the ability of vessels to safely navigate the harbor, especially larger commercial vessels, which often require a 15-foot channel depth (HydroPlan and Anchor QEA 2015). Any vessels attempting to navigate through the harbor in these unsafe conditions would have increased potential for stranding and associated risks. Additionally, the inability of USCG vessels to transit the harbor could compromise emergency response in the area. Therefore, the impacts of the No Action Alternative on navigation and navigational safety would be significant.

4.8.2.2 Proposed Action

The Proposed Action includes maintenance dredging of the federal channels to restore shoaled areas to their design depths and improve navigational safety in the harbor. The number of moorings and slips in the harbor would remain unchanged by the Proposed Action. To ensure safe transit during maintenance dredging activities, appropriate coordination would be maintained with the Crescent City Harbor District and USCG, and ingress and egress lanes would be established and regulated. Additionally, information regarding dredging operations (i.e., times, durations, and locations) would be published in the USCG's weekly Local Notice to Mariners and posted at various locations in the harbor's upland area. Thus, any impacts resulting from the Proposed Action's maintenance dredging and placement activities would be negligible as they would not impede access to the channels, significantly reduce navigational safety or create a navigational hazard for vessel traffic, interfere with local emergency response in the area, or change the number of moorings and slips.

4.8.3 Mitigation

The impacts of the Proposed Action related to navigation and navigation safety would be less than significant and would not require mitigation.

4.9 Noise

4.9.1 Affected Environment

Noise from dredging and placement activities has the potential to effect aquatic and terrestrial receptors. Sensitive aquatic receptors can include species of fish and marine mammals. Examples of sensitive land based receptors are recreational areas, residences, schools, hospitals, and churches where noise may cause an annoyance and affect daily activities. In the terrestrial area in the immediate vicinity of the Crescent City Harbor potential receptors include industrial and commercial developments.

4.9.1.1 Aquatic Receptors

Ambient underwater noise levels in harbors with vessel traffic generally range around 130 decibels $(dB)_{peak}$ referenced to 1 micro-Pascal (re 1 µPa) (SAIC, 2007). Fish and marine mammals that occur in the Harbor are mobile, but may occasionally be found in the vicinity of project dredging and placement areas and would be sensitive receptors.

4.9.1.2 Terrestrial Receptors

4.9.1.2.1 Industrial Areas

The majority of the area immediately adjacent to the water is open and paved and used for transit, loading, and unloading of vehicles. This area is industrial in nature, including a boat

construction and repair yard and a fish processing facility. The Harbor Office, a USCG Station, the Chart Room Restaurant, and a snack shop are also in this area. The Chart Room Restaurant, snack shop, and RV Park are designated as sensitive receptors for this assessment. Excessive noise could potentially interfere with the intended uses of these locations. The Harbor District Office and USCG Station are exposed to noise levels similar to what would be caused by dredging as a normal part of their operations. The distances of the various receptors from the channels are listed in ***Table 14*** below.

4.9.1.2.2 Commercial Areas

Most of the commercial area businesses focus on tourism. There are nine hotels, three RV parks, four restaurants, a car wash, a marine supply store and Ocean World. Due to the inconsistent nature of the fishing industry and the decline of the mining and logging industries, Crescent City is investing in its tourism infrastructure and the harbor area is the major lodging district (Personal Communication, Charlie Helms[5]). The City receives most of its visitors in the summer. Visitation peaks around the 4th of July since it is one of the few cities in the area that has a fireworks display. Visitors tend to stop in Crescent City as they travel between the National and State Parks to see Redwoods during the summer months. The RV parks, hotels and restaurants in the vicinity of the Harbor are designated as sensitive receptors for this assessment. The closest sensitive receptor in the commercial area, the Bayside RV Park, is approximately 640 feet away from the closest channel to be dredged.

Table 13. Distance of receptors from channel for noise assessment

Receptor	Land use Area	Sensitive (Y/N)	Distance from Channel (ft)
Harbor Office	Industrial	N	200
U.S. Coast Guard Station		N	350
Chart Room Restaurant		Y	1,000
Snack Shop		Y	600
Bayside RV Park	Commercial	Y	640

[5] Charlie Helms, Harbor Master, Crescent City Harbor

4.9.2 Environmental Consequences

4.9.2.1 No Action Alternative

The No Action Alternative would have no impact on noise. Ambient noise would occur per existing conditions. The peak level of noise generated by the largest boats that frequent the Harbor is 90 dBA at a distance of 50 feet. This results in an attenuated noise level of 78 dBA at the Harbor Office (closest receptor); 73 dBA at the U.S. Coast Guard Station; 68 dBA at the Bayside RV Park; and 64 dBA at the Chart House.

4.9.2.2 Proposed Action

Under the Proposed Action for the 2019 maintenance dredging episode, noise will be generated when dredges are operating in the Harbor channels. It is possible that both a mechanical dredge and a hydraulic dredge would be in operation simultaneously – the hydraulic dredge would operate in the entrance channel and the mechanical dredge would operate in the Inner Harbor Basin Channel and the Marina access channel.

Fish and marine mammal aquatic receptors are frequently exposed to vessel traffic, are highly mobile, and can easily avoid dredging and placement activities and the noises associated with these activities. The National Marine Fisheries Service (NMFS) current underwater sound thresholds for impacts to marine mammals suggests that a received sound pressure level between 180 and 190 dB root mean square (rms) (re 1 µPa) may result in injury to cetaceans and pinnipeds, respectively, and 120 dB_{rms} from a continuous noise source (e.g. dredging) may result in behavioral disturbance/harassment (Reine and Dickerson, 2014). Thresholds of 150 dB_{rms} have generally been adopted for protecting salmon and other fish species (WSDOT, 2006 as cited in SAIC, 2007). Reine and Dickerson (2014) recorded and analyzed underwater sounds generated by a hydraulic cutterhead dredge removing sandy material from the Stockton deepwater shipping channel in California and found sound levels recorded from the bow of the dredge reached a maximum of 143.5 dB_{rms} (re 1 µPa) at 50m from the sound source, dropped to an average of 130dB_{rms} by 100m, and an average of below 120dB_{rms} by 200m. Underwater sound pressure levels of 99 to 124 dB_{rms} (re 1 µPa-m) were measured at approximately 150 m from the source during clamshell bucket dredging in Cook Inlet, Alaska (SAIC, 2007).

Assuming these sound levels were given off by the cutterhead and clamshell dredges utilized in the Proposed Action, sound pressures would remain below injury thresholds for marine mammals and disturbance thresholds for fish species. Marine mammals could exhibit behavioral disturbance within 200m of the cutter head dredge and 150m of the clamshell dredge; but given the location is a harbor with frequent vessel traffic, ambient noise levels may be around 130 dB normally which would already be higher than the disturbance threshold. Given the mobility of marine mammals and fish; the minimal level by which ambient conditions are likely to be exceeded and in only close proximity to the dredge equipment; the short

dredging duration likely to be associated with the proposed action; and the abundance of similar habitat conditions around the site; effects from dredge noise/movement on aquatic receptors are expected to be temporary, minor, and less than significant.

In terms of terrestrial receptors, the U.S. Coast Guard Station is the only receptor that is proximal to where both dredges could operate and could be exposed to noise from both dredges simultaneously. Noise emissions from dredging would be localized, temporary and intermittent and would be negligible when taken in the context of the existing ambient noise. The engine on the dredge is expected to be similar in size and power to some of the larger boats that frequent the Harbor.

A summary and comparison of calculated noise levels is shown in ***Table 15.*** For the Proposed Action, noise levels are expected to be only nominally higher than those in the No Action alternative. The peak noise level at each receptor is the result of both peak ambient and peak dredge noise. For example, at the Harbor Office, the peak ambient noise level of 78 dBA (from a large boat entering or leaving the Harbor) combined with the peak noise level of 78 dBA (from the operation of the Cutterhead Dredge) is calculated to be 81 dBA. The increases in noise levels of the proposed action relative to the no action alternative are barely perceptible – a perceptible change in noise is generally considered to be about 3 dBA. There have been no recorded complaints about noise associated with prior maintenance dredging activities. Impacts of the Proposed Action on terrestrial noise receptors would be less than significant.

Table 14. Comparison of terrestrial noise levels for the No Action and Proposed Action

Noise Source	Receptor	Sensitive (Y/N)	Peak Noise Level at 50 ft (dBA)	Distance from Noise Source (ft)	Peak Noise Level at Receptor	
					No Action[1]	**Proposed Action[2]**
Typical Large Boat in Harbor (No Action) or Cutterhead Dredge (Proposed Action)	Harbor Office	N	90	200	78	81
	U.S. Coast Guard Station	N	90	350	73	76
	Chart Room Restaurant	Y	90	1000	64	67
	Bayside RV Park	Y	90	640	68	71

[1] Noise from existing vessels only.
[2] Combined noise from existing vessels and dredge.

4.9.3 Mitigation

The impacts of the Proposed Action related to noise would be less than significant and would not require mitigation.

4.10 Recreation

4.10.1 Affected Environment

Crescent City and the surrounding areas of Del Norte County offer a wide variety of recreational activities. Redwood National and State Parks surround Crescent City and include Del Norte Coast Redwoods State Park and Jedediah Smith Redwoods State Park. These parks offer backcountry camping, hiking, wildlife viewing, and kayaking opportunities. The coastal area and Redwood forests surrounding Crescent City provide habitat for a wide variety of birds. As a result, birding is a popular recreational activity.

Water-related recreational activities in the Crescent City Harbor area include fishing, boating, and surfing. Bottom fishing, tuna fishing, crabbing, and salmon fishing are common activities conducted from Crescent City. The B Street Pier, located in the Harbor just east of the Breakwater, is also used for recreational crabbing.

South beach, immediately south of the Harbor is a popular surfing location. At the north end of the beach, Whaler Island and the sand barrier provide a sheltered area that is a popular surfing site during spring and between winter storm fronts.

4.10.2 Environmental Consequences

4.10.2.1 No Action Alternative

With the cessation of maintenance dredging, the federal channel would eventually shoal and water depths would decrease to that of the surrounding natural bottom. Recreational boating activities would be restricted to boats that could safely navigate such shallow depths. Other non-boating related recreational activities would not be impacted. The No Action Alternative would have an adverse impact on recreational boating.

4.10.2.2 Proposed Action

The presence of dredges working in the navigation channels during maintenance dredging would require boaters to use caution when passing. Information regarding dredging operations (i.e., times, durations, and locations) would be published in the USCG's weekly Local Notice to Mariners and posted at various locations in the harbor's upland area. Consequently, any impacts resulting from the Proposed Action's maintenance dredging activities would be negligible as dredging would not impede access to the channels, significantly reduce

navigational safety or create a navigational hazard for vessel traffic, or interfere with local emergency response in the area.

Placement of dredged material at Whaler Island would require that access to the area be restricted. As a result, the area immediately adjacent to Whaler Island and the Sand Barrier would not be available for surfing during the approximately 7 week long period when hydraulic dredging would be conducted. However, the area immediately to the south would continue to be available to surfers. . Given the availability of nearby recreational area for surfing, impacts to this form of recreation from the Proposed Action would be less than significant.

Maintenance dredging would allow the continuation of existing recreational activities at Crescent City Harbor. Impacts of maintenance dredging on recreational activities would be minor and would be limited to the period when dredging occurs.

4.10.3 Mitigation

The impacts of the Proposed Action related to recreation would be less than significant and would not require mitigation.

4.11 Threatened and Endangered Species and Protected Habitats

4.11.1 Affected Environment

A number of protected species and habitats have been documented to occur or could potentially occur within the vicinity of the Proposed Action. These species and habitats are protected under one or more federal and/or state regulations (briefly described in ***Section 6***, Compliance with Environmental Requirements).

- Endangered Species Act (federal)
- Marine Mammal Protection Act (federal)
- Magnuson-Stevens Fishery Conservation and Management Act (federal)
- Migratory Bird Treaty Act (federal)
- Marine Protected Areas (federal/State of California)
- CA State Endangered Species Act (State of California)

4.11.1.1 Endangered Species Act (ESA)

A variety of protected species under jurisdiction of the ESA have been documented to occur or have the potential to occur within the study area (***Table 16***). Their listing status under the ESA as well as designated critical habitats that could potentially occur within the study area are described in the following section. The geographic extent to which project actions could potentially affect protected species and their habitats under jurisdiction of the ESA, as well as

the effects of the Proposed Action to those species and their protected habitats, is evaluated in the Biological Assessment (BA) (***Appendix C***) submitted to the USFWS and the NMFS for consultation on the Proposed Action.

4.11.1.2 Marine Mammal Protection Act (MMPA)

Marine mammals are protected under the federal MMPA. ***Table 16*** also details marine mammals that have the potential to occur within the study area. Since a number of marine mammals are documented to occur in nearshore and open ocean environments off of the California coastline, the list of marine mammals in the table below is not exhaustive, but identifies the more common marine mammals that might be expected to occur within the study area.

Table 15. Summary of protected species and habitats.

Common Name	Scientific Name	Federal Status	CA State Status	Designated Critical Habitat	Occurrence in Study Area (Upland, Riverine, Nearshore, Open Ocean)
BIRDS					
Marbled murrelet	*Brachyramphus marmoratus*	Threatened	Endangered	Designated	Uplands/nearshore/open ocean
Northern Spotted owl	*Strix occidentalis caurina*	Threatened	Candidate	Designated	Uplands
Short-Tailed albatross	*Phoebastria albatrus*	Endangered		n/a	Nearshore/open ocean
Western snowy plover	*Charadrius nivosus*	Threatened		Designated	Uplands, beach areas
Yellow-Billed Cuckoo	*Coccyzus americanus*	Threatened	Threatened	n/a	Uplands
Bald eagle	*Haliaeetus leucocephalus*	Bald and Golden Eagle Act	Endangered	n/a	Uplands, nearshore/harbor
FISH					
Eulachon	*Thaleichthys pacificus*	Threatened		Designated	Freshwater/estuarine/ nearshore/open ocean
North American green sturgeon	*Acipenser medirostris*	Threatened		Designated	Freshwater/estuarine/ nearshore/open ocean
Southern Oregon/Northern California Coast Coho salmon	*Oncorhynchus kisutch*	Threatened		Designated	Freshwater/estuarine/ nearshore/open ocean

Common Name	Scientific Name	Federal Status	CA State Status	Designated Critical Habitat	Occurrence in Study Area (Upland, Riverine, Nearshore, Open Ocean)
Central California Coast Coho	*O. kisutch*	Endangered	Endangered	Designated	Freshwater/estuarine/ nearshore/open ocean
California Coastal Chinook	*O. tshawytscha*	Threatened	Endangered	Designated	Freshwater/estuarine/ nearshore/open ocean
Northern California Coast Steelhead	*O. mykiss*	Threatened		Designated	Freshwater/estuarine/ nearshore/open ocean
Central California Coast Steelhead	*O. mykiss*	Threatened	Threatened	Designated	Freshwater/estuarine/ nearshore/open ocean
Tidewater goby	*Eucyclogobius newberryi*	Endangered	Endangered	Designated	Estuarine/nearshore
INVERTEBRATES					
Mardon skipper	*Polites mardon*	Candidate		n/a	Uplands
Oregon Silverspot butterfly	*Speyeria zerene hippolyta*	Threatened		Designated	Uplands
TERRESTRIAL MAMMALS					
Pacific Fisher	*Martes pennanti*	Proposed Threatened	Candidate	n/a	Uplands
MARINE MAMMALS					
Harbor seal	*Phoca vitulina*	Threatened / MMPA		n/a	Nearshore/open ocean
Dall's porpoise	*Phocoenoides dalli*	Protected MMPA		n/a	Nearshore/open ocean
Pacific white-sided dolphin	*Lagenorhynchus obliquidens*	Protected MMPA		n/a	Nearshore/open ocean
Steller sea lion	*Eumetopias jubatus*	Threatened / MMPA		n/a	Beaches/Rocks/Nearshore/open ocean
Northern fur seal	*Callorhinus ursinus*	Protected MMPA		n/a	Beaches/Rocks/Nearshore/open ocean
Northern elephant seal	*Mirounga angustirostris*	Protected MMPA		n/a	Beaches/Rocks/Nearshore/open ocean
Harbor seal	*Phoca vitulina*	Protected MMPA		n/a	Beaches/Rocks/Nearshore/open ocean
Southern sea otter	*Enhydra lutris nereis*	Threatened / MMPA		n/a	Beaches/Rocks/Nearshore/open ocean

Common Name	Scientific Name	Federal Status	CA State Status	Designated Critical Habitat	Occurrence in Study Area (Upland, Riverine, Nearshore, Open Ocean)
Gray whale	*Eschrichtius robustus*	Endangered / MMPA		n/a	Nearshore/open ocean
Blue whale	*Balaenoptera musculus*	Endangered / MMPA Depleted		n/a	Open Ocean
Fin whale	*Balaenoptera physalus*	Endangered / MMPA Depleted		n/a	Open Ocean
Humpback whale	*Megaptera noveangliae*	Endangered (Proposed Threatened) / MMPA Depleted		n/a	Open Ocean
Sei whale	*Balaenoptera borealis*	Endangered / MMPA Depleted		n/a	Open Ocean
Sperm whale	*Physeter macrocephalus*	MMPA		n/a	Open Ocean
PLANTS					
Western Lily	*Lilium occidentale*	Endangered	Endangered	n/a	Uplands/wetlands
REPTILES					
Loggerhead turtle	*Caretta caretta*	Threatened		n/a	Open Ocean
Green turtle	*Chelonia mydas*	Endangered		n/a	Open Ocean
Leatherback turtle	*Dermochelys coriacea*	Endangered		n/a	Open Ocean
Olive (Pacific) ridley	*Lepidochelys olivecea*	Endangered		n/a	Open Ocean

4.11.1.3 Essential Fish Habitat

The Magnuson-Stevens Fishery Conservation and Management Act, as amended by the Sustainable Fisheries Act of 1996 (Public Law 104-267), requires federal agencies to consult with NMFS on activities that may adversely affect essential fish habitat (EFH). The act defines EFH as "those waters and substrates necessary to fish for spawning, breeding, feeding, or growth to

maturity. Within the Proposed Action area, EFH is documented to occur for the following FMP species groups:

- Pacific Coast Groundfish FMP
- Coast Pelagic FMP
- Pacific Coast Salmon FMP
- Highly Migratory Species

4.11.1.4 California Marine Life Protection Act – Marine Protected Areas

The State of California has designated Marine Protected Areas (MPAs) off the coast of California. MPAs are named, discrete geographic marine or estuarine areas designed to protect or conserve marine life and habitat. There are different marine managed areas classifications used in California's MPA network, including three MPA designations (State Marine Reserve, State Marine Conservation Area, State Marine Park), a marine recreational management area (State Marine Recreational Management Area), and special closures. Each designation is assigned special protections and restrictions regarding commercial and recreational fishing and harvesting, access, and habitat removal. A map showing the designated MPAs in Northern California is shown in ***Figure 8***. The closest MPA to Crescent City Harbor/Whaler Island is the False Klamath Rock Special Closure Area which is approximately 10 miles to the south.

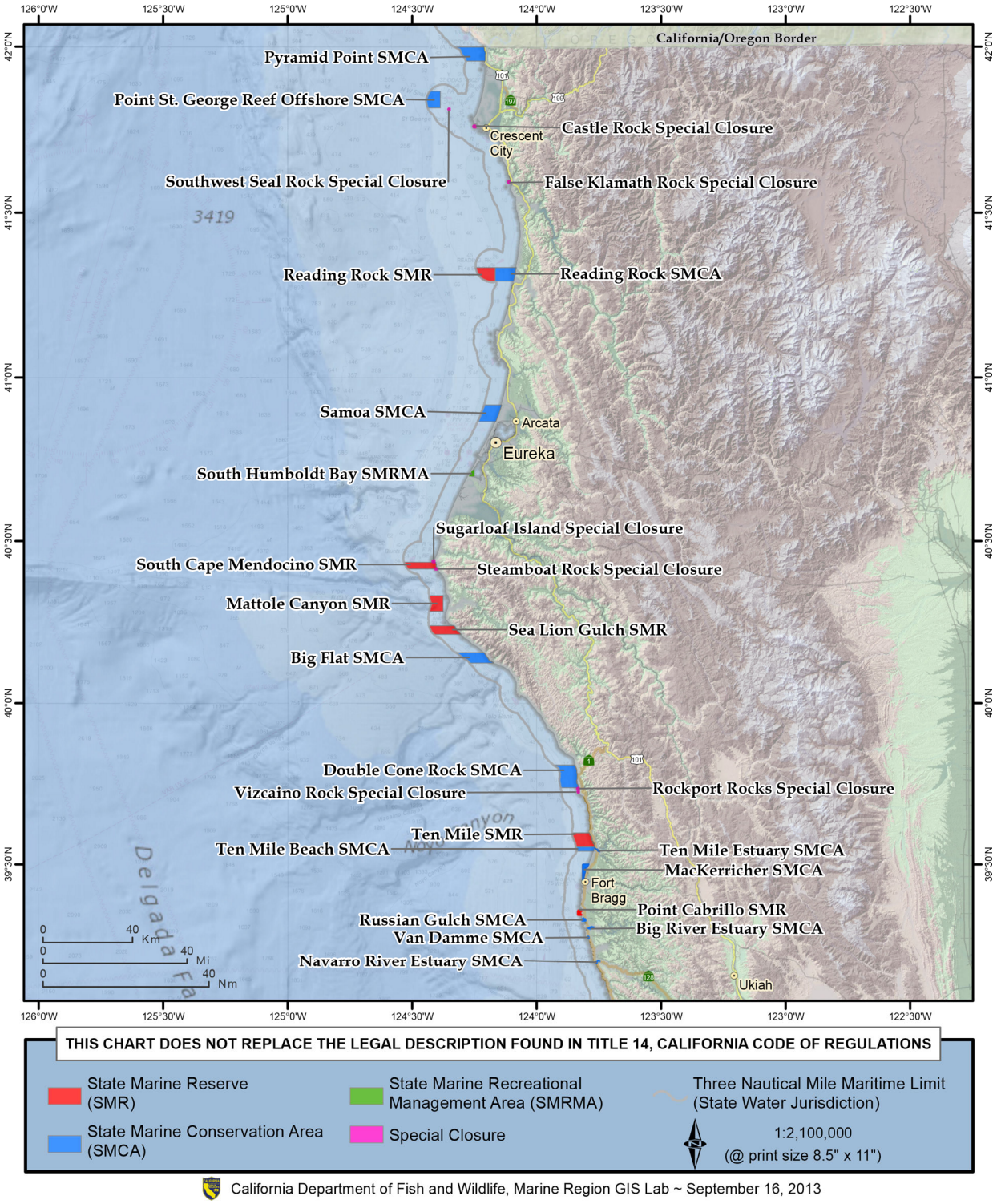

Figure 8. Marine Protected Areas in Northern California.

4.11.1.5 Migratory Bird Treaty Act (MBTA)

The MBTA of 1918, as amended, implements various treaties and conventions between the United States and other countries, including Canada, Japan, Mexico, and Russia, for the protection of migratory birds (16 USC 703–712). The act classifies almost all species of birds as 'migratory' except for a few specific game and nonnative birds. Under the Act, taking, killing, or possessing migratory birds, or their eggs or nests, is unlawful. California is noted for its high diversity of bird species given the state's position within the Pacific Flyway, other migratory corridors, climate, topographic and vegetative diversity, and proximity to varied habitat zones including the Pacific Ocean. A number of resident to highly migratory bird species would be expected to occur within all areas of the proposed project actions and could include terrestrial birds, shorebirds, waterfowl, and ocean-going species.

4.11.1.6 California State Endangered Species Act (CESA)

The CESA affords state designation and protection to those native species and their habitats, threatened with extinction and those experiencing a significant decline which, if not halted, would lead to a threatened or endangered designation. The California Department of Fish and Wildlife (CDFW) is responsible for the listing and protection of state listed species and maintains a list of state designated species. CESA affords state protection to species, in addition to federal protection for species listed under the federal Endangered Species Act. Species under CESA that may potentially occur within the project area are listed in ***Table 16***.

4.11.2 Environmental Consequences

4.11.2.1 No Action Alternative

Under the No Action Alternative, no additional federal maintenance dredging or would occur. Therefore, no impacts to protected species and habitats would occur under the No Action Alternative.

4.11.2.2 Proposed Action

Under the Proposed Action, material would be dredged from the Crescent City Harbor federal channels and placed at Whaler Island placement site and HOODS.

Impacts to Species and Habitats under listing of the Federal Endangered Species Act

Potential impacts to species and their designated critical habitats under the federal ESA are analyzed and addressed in the BA prepared by USACE for the Proposed Action consultation with section NMFS and USFWS under Section 7 of the ESA (***Appendix C***). The BA takes into consideration equipment proposed, timing and duration of work, sediment quality and quantity, noise generated during dredging, alterations of hydrology and benthic habitats and other factors. Based on the BA, USACE has determined that the Proposed Action may affect but is not likely to adversely affect the Southern Oregon/Northern Californa Cost (SONCC) coho

salmon; North American Green Sturgeon, Stellar Sea Lion, Marbled Murrelet, Tidewater Goby, and Western Lily. The BA was submitted to NMFS and USFWS on February 25, 2019. The NMFS responded and concurred with the USACE not likely to adversely affect determination on March 26, 2019 (***Appendix C***). A revised BA was submitted to USFWS on April 24, 2019 with the inclusion of a monitoring plan to monitor for effects to the Western Lily (as described in detail in section 4.7 – Hydrology). The USACE is awaiting a response from the USFWS regarding their determination but has held ongoing interagency discussions with USFWS and expects concurrence with the not likely to adversely affect determination. The FONSI for the proposed action, if appropriate, will not be signed until a determination has been received from USFWS.

Impacts to Magnuson-Stevens Fishery Conservation and Management Act / Essential Fish Habitat (EFH)

The BA prepared by USACE for the Proposed Action includes an Essential Fish Habitat Assessment for consultation with NMFS (***Appendix C***). Impacts to EFH may occur as a result of dredging and placement of dredging material which could result in degradation of EFH for breeding, rearing, feeding and migration of EFH species and habitats; placement of dredge material could result in temporary alteration of available habitat, food base, and rearing areas. In the EFH assessment, USACE determined that the Proposed Action may adversely affect EFH for the fisheries present in the project area (as described in Section 4.11.1.3). The NMFS concurred with the USACE determination on March 26, 2019. The NMFS found that adverse effects would arise from temporarily degraded water quality due to suspended sediments and temporary reduction in benthic prey before recolonization. However, NMFS concluded that the high wave environment at the Whaler Island placement site and HOODS would quickly ameliorate suspended sediments and recovery and recolonization of most benthic prey would occur by the following season. Therefore, NMFS concluded that no EFH conservation recommendations were warranted (***Appendix C***). Given this, impacts to EFH from the Proposed Action would be temporary and less than significant.

Impacts to Marine Protected Areas

Crescent City Harbor/Whaler Island are approximately 10 miles north of the False Klamath Rock Special Closure Area, the nearest MPA to the proposed project plan area. It is unlikely that the volume of sediment placed at Whaler Island would be carried at such a significant amount to the Klamath Rock Special Closure Area to affect the MPA. Therefore, effects to MPAs from the Proposed Action are not expected.

Impacts to Marine Mammals (Marine Mammal Protection Act)

Marine mammals may be temporarily affected and disturbed by vessel noise, increases in turbidity, and increased risk of ship strike. Marine mammals are frequently exposed to vessel traffic, are highly mobile, and can easily avoid dredging and placement activities. They may avoid feeding in areas of dredged material placement and may be affected by short term displacement of forage foods within the dredged material placement areas. As described in sections 4.3 (Biological Resources) and 4.9 (Noise), impacts to marine mammals are expected to be minor, temporary, and less than significant.

Impacts to Birds under the Migratory Bird Treaty Act (MBTA)

Dredge operations and placement of dredge material may result in displacement of foraging birds from equipment operation/noise, but this effect would be temporary and given the availability of similar or higher-quality foraging and resting habitat in the project vicinity, the impact would be less than significant. Thus, the Proposed Action is not expected to adversely impact migratory birds.

4.11.3 Mitigation

4.11.3.1 No Action Alternative

No mitigation is required for the No Action Alternative.

4.11.3.2 Proposed Action

As described above, impacts to federally endangered species, EFH, marine mammals protected under the MMPA, marine protected areas, and migratory birds protected under the MBTA are expected to be less than significant. The following minimization measures will be implemented as part of the Proposed Action to avoid impacts to special status species and areas.

MM-TE-01: ***Appendix A*** describes the monitoring and response plan that will be implemented to verify there will be no adverse impacts to Western lily habitat. Daily observations will be made during dredging to determine whether flow through the culverts under U.S. Highway 101 is being impeded by accumulation of material on the downstream portions of the beach. If it is determined that flow is being impeded, the contractor will be required to contact the USACE in order to determine a corrective course of action.

MM-TE-02: The California Regional Water Quality Control Board (CRWQB) Monitoring and Reporting Program No. R1-2000-59 (Revised December 30, 2004) for Crescent City Harbor District Maintenance Dredging requirements, including effluent and receiving water monitoring at Whaler Island during placement and an annual biological survey the summer following placement, will be followed during dredging and placement activities.

4.12 Socioeconomic Resources

4.12.1 Affected Environment

Crescent City is located in Del Norte County. It is the county seat and the largest city in the county. Del Norte County is a remote sparsely populated area, surrounded by state and federal parks. The closest towns to Crescent City with populations over 15,000 are Arcata, California located 78 miles to the south and Coos Bay, Oregon located 139 miles to the north. ***Table 17*** provides socioeconomic data for Crescent City and Del Norte County (USCB 2016).

Table 16. Socioeconomic statistics for Crescent City and Del Norte County

Statistic	Crescent City	Del Norte County
Population – April 2010	7,640	28,610
Population – July 2015	6,786	27,254
% Change in Population from 2010 to 2015	-13%	-5%
Persons under 18*	14.5%	21.2%
Persons over 65 *	7.7%	15.6%
White alone**	66.1%	73.7%
Black or African American alone**	11.9%	3.5%
Asian alone**	4.4%	3.7%
Hispanic or Latino**	30.6	17.8%
Housing Units**	1,906	11,186
Owner-occupied housing units**	29.5%	59.6%
Median value of owner occupied housing units**	$153,300	$180,100
Per capita income in 2014 dollars	$27,885	$19,424
Persons in poverty	30%	22.4%

*Latest Census Bureau data are for July 2014

** Latest Census Bureau data are for April 2010

The most common industries in Crescent City are public administration, accommodation and food services, health care, educational services, arts, entertainment, and recreation, food and beverage stores, social assistance, and agriculture, forestry, fishing, and hunting (City-Data.com 2016).

The Proposed Action would induce no change in housing supply, population or demand for housing and public services. The Proposed Action would involve minimal land-based construction activity.

4.12.2 Environmental Consequences

4.12.2.1 No Action Alternative

As elaborated in detail in the Crescent City Dredged Material Management Plan (HydroPlan and Anchor QEA 2015), the No Action Alternative would cause adverse socioeconomic changes. The following impacts would be expected to result from the No Action Alternative Plan:

1. An absence of maintenance dredging will cause the Marina access channel to become impassable.
2. Industries that rely on maintenance of navigable federal and non-federal channels will relocate to the nearest available harbor or abandon their businesses.
3. A portion of commercial boats relocated to a new harbor will travel back to the Crescent City fisheries to maximize fish catch.
4. The fish processing facilities, marine suppliers, marine repair facilities, marine refrigeration companies, cold storage companies, ice facilities, fuel docks, bait shops, vessel repair/maintenance companies, retail fish markets, charter operations, port management, and RV Parks would all be directly affected by the closure of the harbor.
5. The U.S. Coast Guard Station would relocate and still have to oversee navigation in waters outside of Crescent City Harbor.

All of these impacts would induce the sale of homes, loss of employment, income and revenues in Crescent City and its immediate surroundings. Estimated economic losses (in fiscal year 2015 price levels) are $19 million per year.

4.12.2.2 Proposed Action

The Proposed Action would be a continuation of operation and maintenance dredging of the federal channels at Crescent City Harbor and would not impact existing socioeconomic conditions.

4.12.3 Mitigation

The socioeconomic impacts of the Proposed Action would be less than significant and therefore, would not require mitigation.

4.13 Wetlands and Waters of the United States

4.13.1 Affected Environment

Pursuant to Section 404 of the Clean Water Act (CWA), rivers, streams, adjacent wetlands, and the Pacific Ocean out to the 3-mile limit, are considered “waters of the United States.” Wetlands were not formally delineated as part of this study, but were identified using existing wetland resource mapping information including the USFWS National Wetlands Inventory

(NWI) (USFWS 2016b). NWI maps are prepared from the analysis of high altitude (satellite) imagery or remotely sensed data related to vegetation, hydrology, and geography. A margin of error is inherent in the use of imagery; thus, detailed on-the-ground inspection of any particular site may result in revision of the wetland boundaries or identification of unmapped/unknown wetlands. A NWI map of Crescent City Harbor depicting the known wetlands within the project area is shown in ***Figure 9***. The mapped wetland communities include:

- Estuarine and Marine Deepwater (harbor, marina, lower reach of Elk Creek downstream of U.S. 101)
- Estuarine and Marine Wetland (Crescent Beach area south of Whaler Island jetty)
- Palustrine Unconsolidated Shore (Crescent Beach area south of Whaler Island jetty)

Figure 9. National Wetlands Inventory, Wetlands Mapped in Crescent City Harbor (USFWS 2016b)

4.13.2 Environmental Consequences

4.13.2.1 No Action Alternative

Under the No Action Alternative, no additional federal maintenance dredging would occur and shoaling would continue. Therefore, no impacts to wetland resources or waters of the United States would occur under the No Action Alternative.

4.13.2.2 Proposed Action

Under the proposed plan, placement of dredge material would take place at Whaler Island and HOODS. Since HOODS is an open ocean placement site, it is not considered a wetland or waters of the U.S. and thus no impacts to these resources would occur from placement activities at HOODS. The USACE implements Section 404 of the CWA, and the USEPA has oversight authority. Section 404(b)(1) of the CWA establishes procedures (Guidelines) for the evaluation of permits covering discharge of dredged or fill material into waters of the United States. The Guidelines provide regulations outlining measures to avoid, minimize, and compensate for impacts. For any permit to be issued under Section 404 of the CWA, the proposed action must address all relevant portions of the Guidelines. The USACE does not issue itself a permit under section 404 of the CWA for actions carried out by USACE that involve discharge of dredge or fill material into waters of the United States. Instead, USACE evaluates the consistency of its proposed actions with the 404(b)(1) guidelines in the NEPA documentation for the proposed project.

The Proposed Action in this case involves the discharge of dredge or fill material in to waters of the United States via the dredging of the federal channels at Crescent City Harbor and placement of dredged material at Whaler Island placement site. The USACE carried out a 404(b)(1) analysis for the proposed 2019 dredging episode and it is included in ***Appendix B***. The 404(b)(1) analysis concludes that all appropriate and practicable steps have been taken, through application of recommendations listed in Sections 230.70 through 230.77 of the Guidelines, to ensure minimal adverse effects of the proposed discharge on waters of the United States. Thus, the Proposed Action complies with CWA Section 404(b)(1) guidelines. Given this, impacts to wetlands and waters of the United States associated with the proposed action would be minimal and less than significant.

4.13.3 Mitigation

4.13.3.1 No Action Alternative

No mitigation is required for the No Action Alternative.

4.13.3.2 Proposed Action

Impacts to wetlands and waters of the United States associated with the proposed action would be minimial and less than significant. BMPs to avoid or minimize impacts to wetlands associated with South Beach are recommended (see MM-TE-01 in ***Section 4.11.3.2***).

4.14 Summary of Environmental Impacts

Table 18 provides a summary of potential impacts related to the No Action and Proposed Action alternatives

Table 17. Summary of environmental impacts

Environmental Resource	No Action	Proposed Action
Aesthetics	no impact	Less than significant impact
Air Quality	no impact	Less than significant impact
Biological Resources	no impact	Less than significant impact
Cultural Resources	no impact	No impact
Geology, Sedimentation, Seismicity	no impact	Less than significant impact
Hazardous Materials	no impact	Less than significant impact
Hydrology, Hydraulics, Water Quality	no impact	Less than significant impact
Navigation & Navigation Safety	adverse impact	Less than significant impact
Noise	no impact	Less than significant impact
Recreation	adverse impact	Less than significant impact
T&E Species	no impact	Less than significant impact
Socioeconomics	adverse impact	Less than significant impact
Wetlands and Waters of the United States	no impact	Less than significant impact

4.15 Summary of Mitigation Measures

Table 18. Summary of mitigation measures

Environmental Resource	Mitigation Measures
Cultural Resources	MM-CR-01: If an inadvertent discovery is made USACE would immediately halt all soil- and sediment-disturbing activities within the area of the find, as appropriate. Prehistoric cultural material includes, but is not limited to: chert or obsidian flakes, projectile points, mortars, and pestles, dark friable soil containing shell and bone dietary debris, heat-affected rock, human burials, shell midden deposits, hearth remains, and stone and/or shell artifacts. Historic material that may occur within aquatic environments, includes but is not limited to, ship remains, maritime-related structures and remains with square nails, whole or fragmentary ceramic, glass or metal objects, wood, nails, brick, anchors, barge remnants, dumpsites, or other materials. A USACE archaeologist or other qualified archaeologist would

	then ascertain the nature of the discovery, the significance of the find, and provide proper management recommendations.
Special Status Species	MM-TE-01: ***Appendix A*** describes the monitoring and response plan that will be implemented to verify there will be no adverse impacts to Western lily habitat. Daily observations will be made during dredging to determine whether flow through the culverts under U.S. Highway 101 is being impeded by accumulation of material on the downstream portions of the beach. If it is determined that flow is being impeded, the contractor will be required to contact the USACE in order to determine a corrective course of action.
	MM-TE-02: The California Regional Water Quality Control Board (CRWQB) Monitoring and Reporting Program No. R1-2000-59 (Revised December 30, 2004) for Crescent City Harbor District Maintenance Dredging requirements, including effluent and receiving water monitoring at Whaler Island during placement and an annual biological survey the summer following placement, will be followed during dredging and placement activities.

5 Cumulative Impacts

Cumulative impacts are effects on the environment that are caused by the Proposed Action in combination with past, current, or future activities. Individually, each activity may have impacts that are less than significant, but collectively, the cumulative effects could be significant. This analysis evaluates the potential for cumulative impacts of the Proposed Action in combination with other past, present, or future activities.

Past activities that have occurred in Crescent City Harbor include jetty construction and maintenance and prior dredging of federal and non-federal areas within the harbor. Other future foreseeable activities that might have a cumulative effect in combination with the Proposed Action would be future maintenance dredging of the federal channels, maintenance dredging of the Coast Guard entrance channel and mooring area, and non-federal maintenance of the mooring areas operated by the Crescent City Harbor District. In the context of these past and foreseeable future actions in the vicinity of the proposed project, the Proposed Action is not expected to have significant incremental cumulative effects.

6 Compliance with Environmental Requirements

6.1 National Environmental Policy Act

Under NEPA, federal agencies must consider the environmental consequences of proposed federal actions. The spirit and intent of NEPA is to protect and enhance the environment through well-informed federal decisions, based on sound science. When it is determined that a proposed action could result in significant environmental effects, an EIS is prepared. NEPA is premised on the assumption that providing timely information to the decision maker and the public about the potential environmental consequences of proposed actions would improve the quality of federal decisions.

This EA has been prepared pursuant to NEPA and Council on Environmental Quality (CEQ) regulations. Impacts on the human environment as a result of the proposed maintenance dredging of the federal channels at Crescent City Harbor and placement of dredged material are anticipated to be less than significant. A Draft Finding of No Significant Impact (FONSI) is included as ***Appendix E***. This Draft EA is being released to agencies and the public for comment. All agency and public comments will be considered and evaluated. If appropriate, a Finding of No Significant Impact (FONSI) will be signed with a conclusion of no significant impacts from this Proposed Action.

6.2 Section 401 of the Clean Water Act

The CWA is the primary federal law governing water pollution. It established the basic structure for regulating surface water quality standards and discharges of pollutants into waters of the U.S. The CWA gives the USEPA the authority to implement pollution control programs, such as setting wastewater standards for industries. In some states, such as California, the USEPA has delegated authority to regulate the CWA to state agencies.

The USACE has initiated consultation for the project with the NCRWQCB for CWA water quality coverage under the existing Waste Discharge Requirements (RWQCB Order R1-2000-59) associated with dredging and placement of material from the Crescent City Harbor at Whaler Island placement site (***Appendix B***).

6.3 Section 404 of the Clean Water Act

The goal of Section 404(b)(1) guidelines of the CWA is "… to restore and maintain, the chemical, physical, and biological integrity of waters of the United States (waters of the U.S.) through the control of discharges of dredged or fill material." The regulations set forth in 40 CFR Section 230 are the substantive criteria issued by the USEPA, used in evaluating discharges of dredged or fill material into waters of the U.S. The 404(b)(1) guidelines provide regulations which outline measures to avoid, minimize and compensate for impacts. They also specify that "no discharge of dredged or fill material shall be permitted if there is a practical alternative to the

proposed discharge which would have less adverse impact on the aquatic ecosystem, so long as the alternative does not have other significant adverse environmental consequences (40 CFR § 230.10[a]).”

A Section 404(b)(1) evaluation has been prepared for the 2019 Crescent City maintenance dredging episode (***Appendix B***). The 404(b)(1) analysis concludes that all appropriate and practicable steps have been taken, through application of recommendations listed in Sections 230.70 through 230.77 of the Guidelines to ensure minimal adverse effects of the proposed discharge on waters of the United States. Thus, the Proposed Action complies with the CWA Section 404(b)(1) guidelines.

6.4 Section 103 of the Marine Protection, Research and Sanctuaries Act

The MPRSA of 1972, or Ocean Dumping Act, regulates intentional ocean placement of materials, authorizes related research, and provides for the designation and regulation of marine sanctuaries. The act regulates the ocean dumping of all material beyond the territorial limit (3 miles from shore) and prevents or limits dumping material that "would adversely affect human health, welfare, or amenities, or the marine environment, ecological systems, or economic potentialities.”

Ocean placement of dredged material associated with the Proposed Action would be at HOODS. Compliance with the Marine Protection, Research and Sanctuaries Act has been established through USEPA’s permitting of this site.

6.5 National Historic Preservation Act

The NHPA (16 USC 470 et seq.) provides direction in preserving, restoring, and maintaining the historic and cultural environment of the nation. Section 106 of the NHPA requires federal agencies to take into account the effects of their undertakings on cultural resources listed or determined eligible for listing in the NRHP. The Section 106 implementing regulations are codified in 36 CFR 800, which describe the procedures that federal agencies follow to consult with the State Historic Preservation Office (SHPO), the Advisory Council on Historic Preservation, Native American tribes, and interested parties. No prehistoric or historic cultural resources/historic properties were identified within the project APE and no shipwrecks were identified as existing in an area that would be affected by the project. USACE has determined that the Proposed Action would have no effect on historic and cultural resources.

6.6 Magnuson-Stevens Fishery Conservation and Management Act

The Magnuson-Stevens Fishery Conservation and Management Act, as amended by the Sustainable Fisheries Act of 1996 (Public Law 104-267), requires federal agencies to consult with NMFS on activities that may adversely affect EFH. The act defines EFH as those waters and substrates necessary to fish for spawning, breeding, feeding, or growth to maturity. An EFH

Assessment was submitted on February 25, 2019 to NMFS for consultation (***Appendix C***). In the EFH assessment, USACE determined that the Proposed Action may adversely affect EFH for the fisheries present in the project area. The NMFS responded and concurred with the USACE determination on March 26, 2019. The NMFS concluded no EFH conservation recommendations were warranted.

6.7 Clean Air Act

The USEPA, in conjunction with the U.S. Department of Transportation, established the General Conformity Rule on 30 November 1993. The rule implements the CAA conformity provision, which requires federal agencies to identify, analyze, and quantify emission impacts of an action and mandates that the federal government not engage, support, or provide financial assistance for licensing or permitting, or approve any activity not conforming to an approved CAA implementation plan.

The project area meets NAAQS for criteria pollutants and therefore, no conformity analysis was required. This EA evaluates air emissions resulting from the Proposed Action and concludes that there will not be a significant impact on air quality.

6.8 Endangered Species Act

Section 7(a) of the ESA of 1973, as amended, designates species and their habitats for protection under the ESA. The ESA directs federal agencies that fund or carry out federal actions to consult with NMFS and USFWS, collectively referred to as the Services, to ensure that those actions do not jeopardize the continued existence of any species or their designated critical habitats.

A BA prepared by USACE for the Proposed Action was submitted to NMFS and USFWS on February 25, 2019 (**Appendix C**). The USACE determined that the Proposed Action may affect but is not likely to adversely affect the Southern Oregon/Northern California Cost (SONCC) coho salmon; North American Green Sturgeon, Stellar Sea Lion, Marbled Murrelet, Tidewater Goby, and Western Lily. The NMFS responded and concurred with the USACE not likely to adversely affect determination on March 26, 2019. A revised BA was submitted to USFWS on April 24, 2019 with the inclusion of a monitoring plan to monitor for effects to the Western Lily. The USACE is awaiting a response from the USFWS regarding their determination but has held ongoing interagency discussions with USFWS and expects concurrence with the not likely to adversely affect determination.

6.9 Executive Order 11990 (Protection of Wetlands)

This order (42 FR 26961, May 25, 1977) requires federal agencies to minimize destruction of wetlands when managing lands, when administering federal programs, or when undertaking construction. Agencies are also required to consider the effects of federal actions on the health

and quality of wetlands. Maintenance dredging of Crescent City Harbor and placement of the dredged material at Whaler Island and HOODS is not expected to adversely impact wetlands.

6.10 Executive Order 12898 (Environmental Justice)

Executive Order 12898 (59 FR 7629, February 16, 1994) requires all federal agencies to "…make achieving environmental justice part of [their] mission by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority populations and low-income populations." No minorities or economically disadvantaged individuals are expected to be disproportionately impacted by the proposed project.

6.11 Coastal Zone Management Act

The Coastal Zone Management Act requires federal agencies to demonstrate Proposed Actions are consistent with the applicable state Coastal Zone Management Plan. On April 23, 2019, the USACE submitted a Consistency Determination (CD) to the California Coastal Commission describing how the proposed action is consistent, to the maximum extent practicable, with the California Coastal Management Plan, pursuant to the requirements of the California Coastal Act of 1976, as amended. The CD is provided as ***Appendix D*** of this EA.

6.12 Marine Mammal Protection Act

The MMPA of 1972, as amended, protects all marine mammals, including cetaceans (whales, dolphins, and porpoises), pinnipeds (seals and sea lions), sea otters, and other marine going mammals within the waters of the United States. The MMPA prohibits, with certain exceptions, the "take" of marine mammals in U.S. waters and by U.S. citizens on the high seas. Potential impacts to marine mammals have been evaluated in this EA. No disturbance or harassment of marine mammals is expected from the Proposed Action. Effects to marine mammals from the Proposed Action are expected to be temporary and insignificant.

6.13 Migratory Bird Treaty Act

The Migratory Bird Treaty Act of 1918, as amended, implements various treaties and conventions between the United States and other countries, including Canada, Japan, Mexico, and Russia, for the protection of migratory birds (16 USC 703–712). Under the Act, taking, killing, or possessing migratory birds, or their eggs or nests, is unlawful. Potential impacts to migratory birds have been evaluated in this EA and determined to be less than significant.

7 Public Involvement

The draft EA is being distributed for a 30-day public and agency review. All comments will be documented and addressed in the final EA. The following agencies have been notified of the availability of this EA for review and comment, along with members of the interested public and local organizations.

A. Federal agencies:

1) U.S. Environmental Protection Agency (EPA Region 9)
2) U.S. Coast Guard (USCG)
3) U.S. Fish and Wildlife Service
4) National Marine Fisheries Service

B. State agencies:

1) California Coastal Commission
2) State Lands Commission
3) State Historic Preservation Officer
4) North Coast Water Quality Control Board
7) North Coast Air Quality Management District
8) California Department of Fish and Wildlife

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APPENDIX A: Monitoring Plan

- South Beach Monitoring Plan

CRESCENT CITY HARBOR

FY 2019 MAINTENANCE DREDGING
SOUTH BEACH MONITORING PLAN

March 2019

U.S. Army Corps of Engineers
San Francisco District
Engineering and Technical Services Division
Planning Branch
Environmental Section B

Crescent City Harbor O&M Dredging Effects Monitoring Plan

Background

The San Francisco District, US Army Corps of Engineers (USACE) regularly dredges the Crescent City Harbor federal channels. During the next planned dredging episode sandy material is planned to be placed near Whaler Island. Questions have been raised regarding the movement of and potential impacts from the placement of sandy material near Whaler Island.

The specific nature of the potential impacts is from sandy material blocking the existing culvert drainages from the Crescent City Marsh. The marsh is located on the opposite side of Highway 101 from the South Beach area. Placement of sandy material near Whaler Island is at the northern end of South Beach.

USACE's position is that placement of sand near Whaler Island does not impact the existing culverts draining the marsh. In order to verify this belief, USACE has agreed to monitor beach profiles after placement of sandy material near Whaler Island.

Proposed Monitoring

USACE will establish five transects across South Beach and will monitor these locations for changes after dredging operations place material near Whaler Island. One transects will be located at each of the three culverts which drain onto South Beach. The remaining two transects shall be located between the culverts. These locations are shown on the attached figure.

Each transect shall be land surveyed at low tide and the data from each survey event will be evaluated to determine changes in the beach profiles over time. Surveys will be conducted before and after the dredging event. The survey from before the dredging event will serve as a baseline condition. Surveys after the placement of dredge material will be conducted quarterly for one year.

The northern and southern culverts have short channels leading to the beach. Transects will follow the center line of the channel as much as possible until the beach is reached. At that point the transects will follow a straight line to the water's edge.

In addition to the above effort the culverts shall be inspected daily during the placement of dredge material. This inspection will consist of visual observations and photo documentation.

At the conclusion of the monitoring effort a report shall be prepared to evaluate the data and present conclusions.

TRANSECTS CONTROL POINTS		
Point #	Easting	Northing
N-1	5,967,576	2,526,908
N-2	5,967,367	2,526,130
NC-1	5,968,404	2,526,325
NC-2	5,968,302	2,526,023
C-1	5,969,105	2,526,035
C-2	5,968,991	2,525,779
SC-1	5,970,184	2,525,352
SC-2	5,969,962	2,525,078
S-1	5,971,205	2,524,683
S-2	5,971,179	2,524,626
S-3	5,971,166	2,524,564
S-4	5,971,148	2,524,545
S-5	5,971,085	2,524,547
S-6	5,971,029	2,524,492
S-7	5,970,861	2,524,286

N-1
N-2
NC-1
NC-2
C-1
C-2
SC-1
SC-2
S-1
S-2
S-3
S-4
S-5
S-6
S-7
101
STARFISH WAY
ANCHOR WAY
REDWOOD HWY
SAND MINE RD

200' 0' 200' 400'
GRAPHIC SCALE

US Army Corps of Engineers®

MARK	DESCRIPTION	DATE

DESIGNED BY: E. KELLER
DRAWN BY: L. KWONG
CHECKED BY:
SUBMITTED BY:
SIZE: ANSI D
ISSUE DATE: MARCH 2018
SOLICITATION NO. W912PT-18-B-XXXX
CONTRACT NO. W912PT-C-XXXX
DRAWING NO: XXXX

U.S. ARMY CORPS OF ENGINEERS
SAN FRANCISCO DISTRICT
450 GOLDEN GATE AVE, 4TH FL, SUITE 0425
SAN FRANCISCO, CA 94102-3404

DEL NORTE COUNTY, CALIFORNIA
CRESCENT CITY HARBOR
MONITORING TRANSECTS LOCATIONS

SHEET ID
01 OF 01

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STUDY

APPENDIX B: Clean Water Act Compliance

- Section 401: Correspondence to North Coast Regional Water Quality Control Board Demonstrating Consistency with the Waste Discharge Requirement

- Section 404: 404(b)(1) Assessment

Emmons, Jason D CIV USARMY CESPN (US)

From: Wiechmann, Mark J CIV USARMY CESPN (USA)
Sent: Tuesday, April 30, 2019 11:19 AM
To: Emmons, Jason D CIV USARMY CESPN (US)
Subject: FW: ACOE Crescent City Dredging

Importance: High

-----Original Message-----
From: Wiechmann, Mark J CIV USARMY CESPN (USA)
Sent: Thursday, April 25, 2019 3:44 PM
To: Stevens, Brandon D.@Waterboards <Brandon.Stevens@Waterboards.ca.gov>
Cc: Bargsten, Stephen@Waterboards <Stephen.Bargsten@waterboards.ca.gov>; Falcone, Gil@Waterboards <Gil.Falcone@waterboards.ca.gov>; Beach, Tessa E CIV USARMY CESPN (USA) <Tessa.E.Bernhardt@usace.army.mil>; Eng, Christopher K CIV USARMY CESPN (USA) <Christopher.K.Eng@usace.army.mil>; Yee, Justin J CIV USARMY CESPN (USA) <Justin.J.Yee@usace.army.mil>; Keller, Edward P CIV (US) <Edward.P.Keller@usace.army.mil>; northcoast@waterboards.ca.gov
Subject: RE: ACOE Crescent City Dredging
Importance: High

Hello Brandon,
Concerning the USACE's proposed Crescent City 2019 maintenance dredging, I am attaching a copy of USACE's consistency determination (CD) to the California Coastal Commission (CCC) which contains several aerial photos that indicate the locations of the proposed action and project footprint. Also in the CD is a proposed monitoring plan of possible beach aggradation along South Beach (Appendix A), and a written request to USEPA (as well as the NCRWQCB) for their concurrence in the findings and determinations of recent sediment testing (Appendix C). The rest of the content that you requested in your email (below), can also be found in our submission to the CCC. A brief summary of this content is also provided below:

Dredged material characterization: Entrance Channel = > 80% sand w/ little or no organic matter content; Marina Access Channel = > 75% (but < 80%) sand w/ low organic matter content; Inner Harbor Basin Channel = << 80% sand + high organic matter content.

Methods of dredging and disposal: Sandy material from the Entrance and Marina Access channels will be dredged/disposed by hydraulic cutterhead and pipeline; siltier material from the Inner Harbor Basin channel will be dredged/disposed by a mechanical clamshell and haul barge.

Placement and disposal locations: The sediment dredged by hydraulic cutterhead will be pipelined to a nearshore placement site just off of Whaler Island; the sediment dredged by clamshell will be barged to HOODS to be disposed of in cells approved by USEPA..

Quantities: Including two-feet of allowable overdepth, Entrance Channel = ~72,000 CY, Inner Harbor Basin Channel = ~23,000 CY, Marina Access Channel = ~23,000 CY, for a grand total of ~118,000 CY (numbers based on a survey conducted 19 February 2019).

Duration and timing of the work: In-water work for both methods (largely performed concurrently) will be ~6 weeks total, including mob & demob; timing will take place within the environmental work window of July 1 - October 15, but

an extension to November 15 is requested (barring heavy rains); note that some of the planned work might have to slip into calendar year 2020 -- to be determined.

Should have any questions or comments, please don't hesitate to contact me. I would appreciate a turnaround at your earliest convenience.

Regards,
Mark

-----Original Message-----
From: Stevens, Brandon D.@Waterboards [mailto:Brandon.Stevens@Waterboards.ca.gov]
Sent: Tuesday, March 5, 2019 4:11 PM
To: Wiechmann, Mark J CIV USARMY CESPN (US) <Mark.J.Wiechmann@usace.army.mil>
Cc: Bargsten, Stephen@Waterboards <Stephen.Bargsten@waterboards.ca.gov>; Falcone, Gil@Waterboards <Gil.Falcone@waterboards.ca.gov>
Subject: [Non-DoD Source] ACOE Crescent City Dredging

Hello Mark,

For activities relating to the attached Crescent City WDR, our office would need a project description that outlines the soil characterization, means and method of disposal, disposal locations, quantities, construction timing, and any aerial photos that demonstrates this information.

Please also cc the following email with the information: northcoast@waterboards.ca.gov <mailto:northcoast@waterboards.ca.gov>

Thanks,

Brandon Stevens

Environmental Scientist

Nonpoint Source/401 Certification Unit

North Coast Regional Water Board

5550 Skylane Boulevard, Suite A

Santa Rosa, CA 95403

brandon.stevens@waterboards.ca.gov <mailto:brandon.stevens@waterboards.ca.gov>

Office: 707-576-2377

We are a paperless office. Guidelines for electronic submittal of documents can be found here:

Blockedhttps://www.waterboards.ca.gov/northcoast/publications_and_forms/available_documents/pdf/2014/ECM_Letter-Guidelines.pdf
<Blockedhttps://www.waterboards.ca.gov/northcoast/publications_and_forms/available_documents/pdf/2014/ECM_Letter-Guidelines.pdf>

Draft Environmental Assessment
2019 Crescent City Harbor Federal Channels Maintenance Dredging

Clean Water Act, Section 404(b)(1) Alternatives Analysis

Contents

Tables

Figures

Acronyms

AEP	Archeological Evaluation Plan
BMPs	best management practices
Chetco	Chetco River Ocean Dredged Material Disposal Site and Nearshore Placement Site
CWA	Clean Water Act
cubic yards	cubic yard
DMMP	Dredged Material Management Plan
EA	Environmental Assessment
HOODS	Humboldt Open Ocean Disposal Site
LEDPA	Least environmentally damaging practicable alternative
MLLW	mean lower low water
MM-CR-XX	mitigation measure for cultural resources
MM-TE-XX	mitigation measure for threatened & endangered species
MPRSA	Marine Protection, Research, and Sanctuaries Act
NODS	New ocean disposal site
ODMDS	Ocean dredged material disposal site
Rogue	Rogue River Ocean Dredged Material Disposal Site
RWQCB	Regional Water Quality Control Board
USACE	U.S. Army Corps of Engineers
USCG	U.S. Coast Guard
USEPA	U.S. Environmental Protection Agency
USFWS	U.S. Fish and Wildlife Service

1 Introduction

The U.S. Army Corps of Engineers (USACE) prepared a Dredged Material Management Plan (DMMP) in 2015 to evaluate dredged material management alternatives and recommend a plan for the long-term management (20 years or more) of material dredged from Crescent City Harbor. However, no placement sites that are currently permitted, have adequate capacity and which can also accommodate the types of dredged material (i.e., sand and silt) were identified. Instead, designation of a new placement site was recommended, though such a designation requires a lengthy review process that cannot be completed in time for the next scheduled maintenance dredging episode in 2019. An Environmental Assessment (EA) was prepared to evaluate near-term options and identify a preferred plan that could be implemented for the 2019 maintenance dredging episode. This 404(b)(1) alternatives analysis supports the determinations of the EA.

1.1 Section 404(b)(1) Regulatory Background

Pursuant to Section 404 of the Clean Water Act (CWA), rivers, streams, adjacent wetlands, and the Pacific Ocean out to the 3-mile limit, are considered "waters of the United States." The USACE implements Section 404 of the Clean Water Act, and the U.S. Environmental Protection Agency (USEPA) has oversight authority.

Section 404(b)(1) of the CWA establishes procedures (Guidelines) for the evaluation of permits covering discharge of dredged or fill material into waters of the U.S. The goal of the Guidelines are to restore and maintain the chemical, physical, and biological integrity of waters of the U.S. through the control of discharges of dredged or fill material. The Guidelines provide regulations outlining measures to avoid, minimize, and compensate for impacts. For any permit to be issued under Section 404 of the CWA, the proposed action must address all relevant portions of the Guidelines.

The purpose of this document is to evaluate compliance of the Agency Preferred Plan selected in the EA with the Section 404(b)(1) Guidelines.

2 Proposed Action

2.1 Project Purpose and Need

Crescent City Harbor serves as the only harbor of refuge between Coos Bay, Oregon, and Fort Bragg, California. Harbor traffic primarily consists of commercial fishing vessels, with commercial fishing activities representing 90% of the Harbor's total commerce. Supplemental uses include some recreational boating and tourism. The U.S. Coast Guard (USCG) also operates an 87-foot patrol boat and a 25-foot auxiliary response boat in Crescent City, and maintains berthing facilities for both vessels at the short dock located directly behind the inner breakwater.

As described in ***Section 1.1*** of the EA, the purpose of the project is to perform maintenance dredging to provide continued safe and reliable commercial and recreational navigation. To

remain a viable option for commercial fishing activities, the Harbor must maintain its federal navigation channels to be accessible for a variety of vessels, especially larger commercial vessels.

2.2 Project Components

2.2.1 Projected Maintenance Dredging Volumes

The Entrance Channel, Inner Harbor Basin Channel, and Access Channel are each authorized to a depth of -20 feet mean lower low water (MLLW), with varying maintenance depths: -20 feet MLLW within the Entrance Channel and -15 feet MLLW within the Inner Harbor Basin and Marina Access Channels. Portions of the Inner Harbor that are outside and adjacent to the federal channels are also maintained by the Crescent City Harbor District to a depth of -15 feet MLLW along the inner breakwater and to a depth of -12 feet MLLW northeast of the Access Channel.

As described in ***Section 1.6*** of the EA, it is estimated that the combined average shoaling and dredging rate of the federal channels is approximately 20,000 cubic yards per year, which equates to approximately 1,667 cubic yards per month (USACE 2006). Based on a 2019 hydrographic survey, the volume of material required to be dredged to achieve the authorized depths in all three federal channels, with 2 feet of allowable overdepth, was 117,559 cubic yards at the time of the survey.

The next maintenance dredging episode is scheduled to occur in September 2019. By that time, there will have been 7 months of additional shoaling on top of what existed in February 2019. At the projected shoaling rate of 20,000 cubic yards per year, or 1667 cubic yards per month, over the course of 7 months, added to the volume of material identified in the February 2019 survey (117,559 cubic yards), the anticipated volume of material to be dredged in October 2019 would be 129,286 cubic yards.

2.2.2 Potential Dredge Material Placement Sites

Potential placement sites initially evaluated are discussed in Section 3.1 of this document, as well as Section 4 of the EA. Ultimately, the following sites were incorporated into project alternatives (***Figures 1 and 2***):

- Whaler Island
- Crescent City Dredge Pond
- Humboldt Open Ocean Disposal Site (HOODS)
- Rogue River Ocean Dredged Material Disposal Site (Rogue)
- Chetco River Ocean Dredged Material Disposal and Nearshore Placement Site (Chetco)

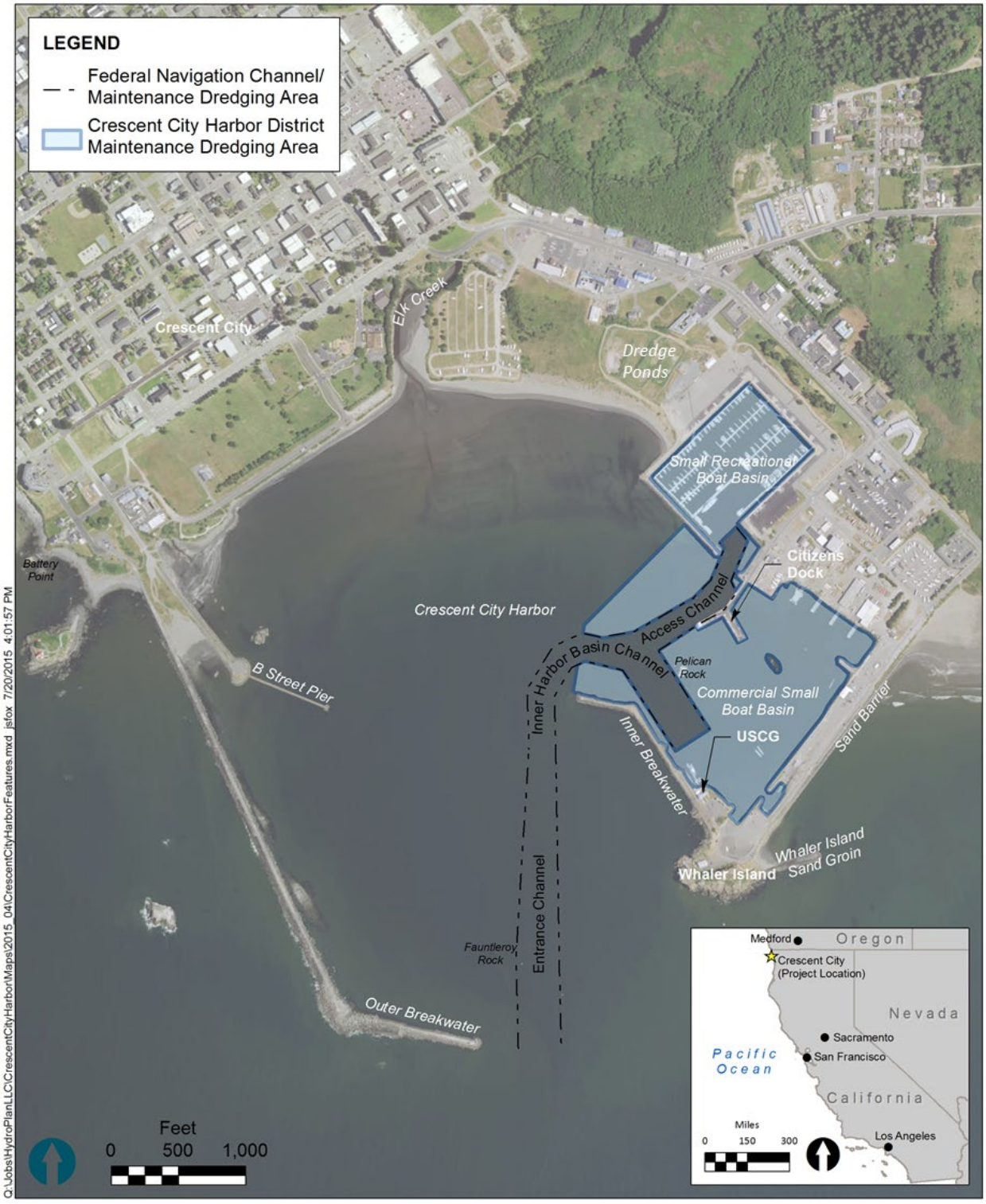

Figure 1. Crescent Harbor Navigation Channel with Dredge Pond and Whaler Island

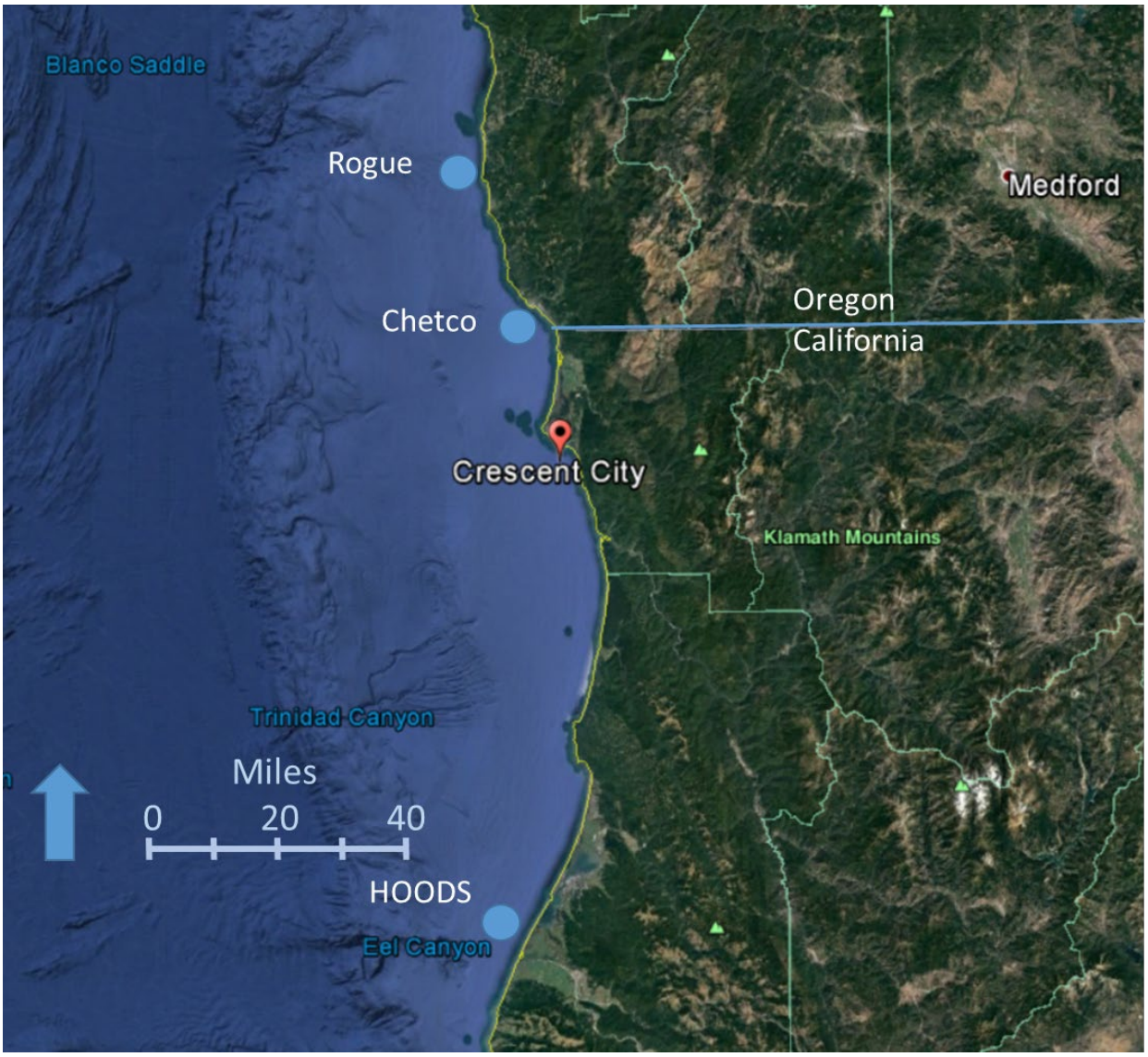

Figure 2. Alternative Dredged Material Placement Sites (Rogue, Chetco, and HOODS)

3 Alternatives

3.1 Initial Alternatives

It is USACE policy to accomplish the placement of dredged material associated with the maintenance dredging of navigation projects in the least costly plan that meets sound engineering standards and complies with federal environmental regulations, including those established by Section 404 of the CWA of 1972 and Section 103 of the Marine Protection, Research, and Sanctuaries Act (MPRSA) of 1972, as amended.

Initial alternatives analyzed included historical and non-historical available sites, as well as potential new sites. A brief explanation is provided for initial alternatives immediately eliminated from further consideration due to cost and timing constraints. Further information

is also provided in both the DMMP and EA. The timing of the project is for 2019, but it may become necessary to postpone some dredging activities into calendar year 2020. Further information on timing can be found in section 3.2.1.3 of the EA.

3.1.1 Available and Previously Used Sites

- **SF-1 Ocean Disposal Site**. This site was established in the 1970s as a regular placement site for Crescent City Harbor dredged material. However, in 1983, SF-1 was converted to an "interim" site due to new placement requirements per the MPRSA. In 1997, use of SF-1 as an interim placement site expired. USEPA does not support the re-establishment of SF-1 in its prior configuration. Therefore, because SF-1 no longer exists as a placement site and likely will not be re-established, it was eliminated from further consideration.
- **Whaler Island**. A partial solution to the need for a Crescent City dredged material placement site was found in 1988 with the use of Whaler Island for placement of sandy material. There is no set volume limit on the combined annual total of suitable federal and non-federal material that can be placed at Whaler Island; however, placement is limited to material that meets certain physical and chemical sediment standards, particularly for grain size and organic carbon content. Historically, only dredged material from the Entrance Channel and Marina Access Channel has met these standards.
- **Crescent City Dredge Pond**. The Crescent City Harbor District formed an agreement with USACE for the placement of dredged material in the Crescent City Dredge Pond. Though the Dredge Pond has a total capacity of approximately 70,000 cubic yards, it is currently full and would need to be emptied in order to be used again. This would be accomplished through placement at a landfill. Currently there are no existing environmental consultations to allow for removal of this material for placement at a land fill or other location. Therefore, this site was eliminated from further consideration.

3.1.2 Additional Available Sites

- **San Francisco Deep Ocean Disposal Site**. This site was authorized by USEPA in 1994, and remains co-managed by USACE and USEPA Region 9. Placement is limited to suitable dredged material from the San Francisco Bay region and other nearby harbors or dredging sites. However, because of its distance from Crescent City (over 300 miles away), this site was eliminated from further consideration.
- **Humboldt Open Ocean Disposal Site**. The Humboldt Open Ocean Disposal Site (HOODS) was designated as an open-ocean placement site by the USEPA in 1995 per Section 102 of the MPRSA. Despite a projected capacity of 50 million cubic yards over a 50 year period, mounding has become evident and subsequently USEPA Region 9 is in the process of expanding the site to increase dispersion. In the meantime, however, USEPA Region 9 officials have indicated that HOODS could still accommodate Crescent City dredged material. HOODS can accept both sandy and fine-grained dredged

material, but USEPA prefers that sandy material be used for beneficial reuse and will only allow sandy material to be placed at HOODS if no other cost-effective beneficial reuse option is available.

- **Chetco River Ocean Dredged Material Disposal and Nearshore Placement Site (Chetco)**. Chetco was officially designated an ocean placement site in 1986. While there is no set annual limit for dredged material that may be placed at Chetco, environmental review of the site assumed a total of 48,000 cubic yards per year as a general guideline. Due to strong current action at the site, Chetco can dissipate placed material fairly quickly. Placement of fine-grained sediment at Chetco is not typically permitted by USEPA, but sandy material (more than 80% sand) is considered suitable for placement at the site.
- **Rogue River Ocean Dredged Material Disposal Site**. The Rogue River Ocean Dredged Material Disposal Site (Rogue) has been used by USACE Portland District since 1962. Typically, only sandy material has been placed at the site due to the predominance of sand in the areas dredged regionally. Although the total annual capacity of Rogue is not defined, the largest annual volumes placed at the site historically were just over 100,000 cubic yards.

3.1.3 Potential New Sites

- **New Ocean Disposal Site**. A new ocean disposal site (NODS) could be used as an alternative to the SF-1 historical site. This new site would be within 10 miles of Crescent City and could either be situated offshore from Crescent City Harbor or located at the California/Oregon Border to accommodate dredged material from both states and USEPA regions. USEPA Region 9 provided a preliminary estimate that it would take 3 years to designate a new site, with the study process costing approximately $3 million. To date, NODS is still not completed. Therefore, because the designation of NODS could not be completed in advance of the 2019 maintenance dredging episode, it was eliminated from further consideration.
- **Crescent City Harbor Waterfront Development Area**. Crescent City Harbor District's Waterfront Development Plan at one point described an existing expansion plan to develop new harbor facilities by beneficially reusing dredged material from the harbor's federal channel and marina as fill. However, as of 2015, implementation of this plan is no longer a priority for Del Norte County, and no design work or approvals for any concepts associated with the plan have been completed or obtained. Therefore, this potential new site was eliminated from further consideration.

The DMMP recommended that the data collection and inter-agency coordination required for designation of a new placement site be undertaken to provide long-term maintenance dredging capacity. This would include consideration of new offshore placement sites or nearshore placement sites for beneficial reuse of dredged materials (Outer Breakwater).

3.2 Screening Criteria

Potential alternative placement sites were initially screened based on availability, proximity, suitability (sands and/or silts), capacity, costs, and incorporation of beneficial reuse, as follows:

- **Availability**. Is the placement site currently available for use without the need for obtaining permits or other approvals? The need for obtaining permits or other approvals could require significant additional commitments in terms of time (3 years or longer) and money (on the order of $3,000,000).
- **Proximity**. Is the placement site located within a reasonable distance from Crescent City?
- **Suitability**. Is the placement site suitable for receiving sandy and/or fine-grained material?
- **Capacity**. Does the placement site have adequate capacity for either sandy, fine grained, or both sandy and fine-grained material that has been historically dredged from Crescent City Harbor?
- **Additional Costs**. Would use of the site require additional costs to make it ready for use, such as for the construction of levees or decanting facilities, removal of existing dredged material, or for design and permitting processes?
- **Beneficial Reuse**. Would the material be beneficially reused?

Because the next maintenance dredging episode for Crescent City Harbor is anticipated to occur in 2019, only currently available placement sites can be used; therefore, all potential new sites were eliminated from further consideration. Additionally, because silty material is not suitable for placement at Whaler Island, Rogue River, and Chetco, these sites must be used in combination with other sites.

3.3 Alternatives Selected for Inclusion in this Analysis

Based on the results of the screening criteria presented in ***Section 3.2***, the following four alternatives were considered for the 2019 maintenance dredging episode:

- **No Action Alternative: Whaler Island & Dredge Pond**. The No Action Alternative assumes no dredging would occur at all in 2019. Under the National Environmental Policy Act, in cases where a project consists of modification of an existing program or management plan, the No Action Alternative may be defined as continuation of the existing management practices. In this case, the No Action Alternative would consist of hydraulically dredging the Crescent City Harbor Channels, with placement of the sandy material at Whaler Island and placement of the silty material in the Crescent City Dredge Pond. However, the dredge pond no longer has adequate capacity to accept additional material; the only viable option would be to remove the dredged material from the site and transport it to a landfill. The Crescent City Harbor District would not have the financial resources to empty the dredge pond in this manner, as the cost would be more than $5.369 million (HydroPlan and Anchor QEA 2015). Consequently, there would be

no capacity for silty material, and maintenance dredging of the Inner Harbor and Access Channels would be deferred until capacity was made available. It is unlikely that USACE would dredge the Entrance Channel if shoaling in the Inner Harbor and Access Channels limited navigation depths. Consequently, the No Action Alternative, as defined in the EA and this analysis, consists of no federal maintenance dredging, resulting in increasing limits on navigation.

- **Agency Preferred Plan.** This alternative consists of placement of sands at Whaler Island and placement of silty material at HOODS. Costs for this alternative assume that 105,000 cubic yards of sandy sediment from the Entrance and Marina Access Channels will be hydraulically dredged and pumped to Whaler Island via dredge pipeline, and that 26,000 cubic yards of fine-grained sediment from the Inner Harbor Basin Channel will be mechanically dredged and barged to HOODS for placement. This alternative will require mobilization and demobilization of two types of equipment: a hydraulic dredge for the sands and a mechanical dredge for removal of the fine-grained sediment.
- **Alternative 1**. This alternative consists of placement of sands at Chetco to the maximum extent possible, placement of the remaining sands at Rogue River ODMDS, and placement of silty material at HOODS. For this alternative it was formulated that 66,000 cubic yards of sandy sediment would be placed nearshore or placed at Chetco (this would use all of the site's assumed maximum annual capacity), 39,000 cubic yards of sandy sediment will be placed at the Rogue River ODMDS, and 26,000 cubic yards of fine-grained sediment will be placed at HOODS. This alternative proposes the placement of sediment composition types at the ocean sites that are consistent with the USEPA's stated preferences. However, Chetco and Rogue were recently designated as only available for placement of locally sourced sediments (Personal Communication, Bridgette Lohrman[1]). Therefore, because Chetco and Rogue are not available for placement of dredged material from Crescent City Harbor, this alternative was eliminated from further consideration.
- **Alternative 2**. This alternative consists of placement of sands and silty material at HOODS and/or Rogue. HOODS has adequate capacity for all of the projected 2019 maintenance dredged material, but Rogue River does not. If Rogue were to be used, it would be in conjunction with HOODS. Formulation for this alternative assumes that all 131,000 cubic yards of sediment would be mechanically dredged and barged to HOODS and/or Rogue ODMDS for ocean placement. However, Rogue was recently designated as only available for placement of locally sourced sediments (Personal Communication, Bridgette Lohrman[2]). Therefore, because Rogue is not available for placement of dredged material from Crescent City Harbor, this alternative was eliminated from further consideration.

[1] Bridgette Lohrman, Ecologist, USEPA Region 10.
[2] Bridgette Lohrman, Ecologist, USEPA Region 10.

All action alternatives assume that 131,000 cubic yards would be dredged from the navigation channel, with approximately 105,000 cubic yards consisting of sandy material from the Entrance and Marina Access Channels, and 26,000 cubic yards consisting of fine-grained material from the Inner Harbor Basin Channel. The No Action Alternative assumes no dredging would occur at all in 2019.

4 Alternatives Analysis (Subpart B)

Subpart B of the Section 404(b)(1) Guidelines establishes the alternatives analysis requirements that must be met. In particular, 40 C.F.R. § 230.10(a) states that no discharge of dredged or fill material shall be permitted if there is a practicable alternative to the proposed discharge which would have less adverse impact on the aquatic ecosystem, so long as the alternative does not have other significant adverse environmental consequences. The least environmentally damaging practicable alternative (LEDPA) must:

- Meet the overall project purpose;
- Be practicable with respect to cost, technology, and logistics;
- Avoid and minimize discharge of dredged or fill material into waters of the U.S; and
- Not entail significant impacts to other non-aquatic environmental resources.

4.1 Overall Project Purpose

As described in ***Section 1.1*** of the EA, the purpose of the project is to perform maintenance dredging to provide continued safe and reliable commercial and recreational navigation. To remain a viable option for commercial fishing activities, the harbor must maintain its navigation channels to be accessible for a variety of vessels, especially larger commercial vessels. All of the action alternatives would meet the project purpose as they would restore safe and reliable commercial and recreational navigation in the Crescent City Harbor through maintenance dredging. The No Action Alternative, however, would not satisfy the overall project purpose. As explained in ***Section 3.3*** of this document, the No Action Alternative would consist of no additional maintenance dredging due to the lack of capacity for silty material in the Crescent City Dredge Pond. Shoaling would continue and navigability of the channels would be increasingly limited.

4.2 Practicability

Subpart B of the Guidelines states that an alternative is practicable if it is available and capable of being done after taking into consideration cost, existing technology, and logistics in light of overall project purposes. Although the act of dredging is not specifically regulated under Section 404 of the CWA, the type of dredge equipment used determines both the cost of dredged material placement and technologically viable placement options, and therefore can be a practicability consideration in a Section 404(b)(1) evaluation. However, the alternatives with Rogue and Chetco have been eliminated, leaving the No Action Alternative and the Preferred Plan.

As described in the DMMP, the primary impediments to dredging at Crescent City Harbor are budgetary constraints and the limited availability of placement sites for dredged material. Budgetary constraints have caused delays in maintenance dredging episodes, and at times have constrained the total volume of dredged material that could be removed. It is anticipated that budgetary constraints will continue to be an impediment to dredging.

Limited capacity for placement of dredged material also poses an increasingly difficult challenge. Although beneficial reuse of dredged material is a USACE priority, the current Whaler Island beneficial reuse placement site can only accept sandy material. The next closest existing beneficial reuse site is 30 miles away at Chetco, but is not available for placement except for locally sourced dredged materials (Personal Communication, Bridgette Lohrman[3]). The Crescent City Dredge Pond (the existing placement site for silty material) is currently full and cannot accept additional dredged material, and as discussed in ***Section 3.1*** of the EA, there has been no existing environmental coordination for removal and placement of the sediment from the dredged pond.

The most practicable alternative would be an alternative that includes removal and placement of all dredged material (172,000 cubic yards) at the lowest cost, with beneficial reuse as an added benefit. Using this criteria, each alternative has been evaluated for practicability as follows:

- **No Action Alternative**. The No Action Alternative assumes no dredging would occur at all in 2019. Because this alternative includes no removal of any dredged material (a critical component of the practicability criteria), it cannot be considered practicable.
- **Agency Preferred Plan**. This alternative includes placement at Whaler Island for beneficial reuse, with the remaining material placed at HOODS. Whaler Island has the highest capacity to receive beneficial reuse material, and is available for placement. As a result, the Agency Preferred Plan achieves the project purpose and provides a placement option that maximizes beneficial reuse as an added benefit. Therefore, the Agency Preferred Plan is the most practicable alternative.
- **Alternative 1**. This alternative consists of placement of sands at the Chetco nearshore placement site to the maximum extent possible, for beneficial reuse. However, Chetco and Rogue are not available for placement of material from Crescent City Harbor. Therefore, Alternative 1 does not achieve the project purpose and consequently is not practicable.
- **Alternative 2**. This alternative is the only alternative that does not include beneficial reuse as an added benefit. Instead, all dredged material would be placed of offshore more than 50 miles away. However, Rogue is not available for placement of material from Crescent City Harbor. Therefore, Alternative 2 does not achieve the project purpose and consequently is not practicable.

[3] Bridgette Lohrman, Ecologist, USEPA Region 10.

The USACE, as authorized by Congress, is responsible for maintaining federal navigation channels to their authorized or lesser regulatory depths. The amount of material to be dredged and consequently placed would be dependent on the extent of sediment accumulation in the federal navigation channels, which is currently forecast to be 172,000 cubic yards for all three action alternatives. However, the amount of material discharged into waters of the U.S. would vary between alternatives, as shown in ***Table 2***.

Table 1. Volume of material discharged into waters of the U.S. in cubic yards

Placement Site	No Action Alternative Whaler and Dredge Pond (cubic yards)	Agency Preferred Plan Whaler and HOODS/Rogue (cubic yards)
Whaler Island (beneficial reuse)		105,000
Dredge Pond (upland pond)		
HOODS (ocean placement)		26,000
Rogue (ocean placement)		
Chetco (nearshore placement and ocean placement)		
Total Impact to Waters of the U.S.	**0**	**131,000**

As proposed, the No Action Alternative assumes no dredging would occur at all in 2019. Therefore, unlike the Agency Preferred Plan, the No Action Alternative would not result in impacts related to the discharge of dredged material into waters of the U.S. It would, however, result in adverse impacts to safety and navigation in the Crescent City Harbor federal channels, as shoaling would continue and water depths would become increasingly limited. Recreation and socioeconomics would also be impacted.

As is shown in ***Table 2***, the Agency Preferred Plan would have impacts on waters of the U.S. in terms of discharge because it entails placement of all material in waters of the U.S. However, the Agency Preferred Plan is ultimately expected to result in the least fill in waters of the U.S. due to the fact that 105,000 cubic yards of material would be placed at Whaler Island. The other alternatives considered which included placement at Rogue and Chetco, even if available for placement, do not have the capacity that Whaler Island has (e.g. Chetco can usually accept up to 66,000 cubic yards of material per year for beneficial reuse) and would therefore have resulted in more impacts to waters of the U.S.

4.3 Significant Environmental Impacts to Non-Aquatic Resources

None of the action alternatives would result in significant impacts to non-aquatic resources. The No Action Alternative, however, would result in the deterioration of navigability in the

federal channels and therefore reduce associated economic output. A detailed analysis of socioeconomic impacts is provided in ***Section 4.12*** of the Final EA.

4.4 Summary

Table 3 summarizes the results of the Subpart B analyses as described in ***Subsections 4.1 through 4.4*** of this document.

Table 2. Subpart B results

Alternative	No Action Alternative	Agency Preferred Plan	Alternative 1	Alternative 2
Meets the overall project purpose and incorporates beneficial reuse		✓		
Most practicable		✓		
Least impacts to U.S. waters		✓		
No significant impacts to non-aquatic resources[4]		✓	✓	✓

As discussed in ***Subsection 4.1***, the No Action Alternative would not meet the overall project purpose. The No Action Alternative, as well as Alternatives 1 and 2, are also not considered to be most practicable as described under ***Subsection 4.2***. The Agency Preferred Plan would have the least impacts to U.S. waters as it entails placement of the majority of dredged material at Whaler Island for beneficial reuse. Lastly, as discussed in ***Subsection 4.4***, none of the action alternatives would have significant impacts to non-aquatic resources; however, the No Action Alternative would result in reduced economic output due to decreased navigability in the harbor.

Based on the results of the Subpart B analysis, the Agency Preferred Plan is the LEDPA. Pursuant to Subparts C through H, the remaining alternatives (No Action Alternative, Alternative 1, and Alternative 2) will not be carried forward in this analysis, and will not be further discussed.

5 Technical Evaluation Factors (Subparts C through F)

The environmental effects of dredged material placement activities associated with dredging the Crescent City Harbor federal navigation channels were analyzed in the Crescent City DMMP and EA. This section evaluates the adverse impacts associated with the placement of dredged material pursuant to Subparts C though F of the Guidelines (***Table 4***). References are included

[4] A Monitoring and Response Plan has been prepared as Appendix A to the EA that provides a strategy for monitoring and avoiding potential significant impacts to the Western lily.

to the section(s) of the EA where the analysis relevant to each applicable evaluation factor is presented.

Table 3. Technical evaluation factors for the Agency Preferred Plan (Subparts C through F)

Evaluation Factor	Not Applicable[1]	Not Significant	Significant
Subpart C, Section 230.20-230.25: Potential Impacts on Physical and Chemical Characteristics of the Aquatic Ecosystem			
1. Substrate *(EA Section 4.7)*		X	
2. Suspended particulates/turbidity *(EA Section 4.7)*		X	
3. Water *(EA Section 4.7)*		X	
4. Current patterns and water circulation *(EA Section 4.7)*		X	
5. Normal water fluctuations *(EA Section 4.7)*		X	
6. Salinity gradients *(EA Section 4.7)*		X	
Subpart D, Section 230.30-230.32: Potential Impacts on Biological Characteristics of the Aquatic Ecosystem			
1. Threatened or endangered species *(EA Section 4.11)*		X	
2. Other aquatic organisms in the food web		X	
3. Other wildlife *(EA Section 4.3)*		X	
Subpart E, Section 230.40-230.45: Potential Impacts on Special Aquatic Sites			
1. Sanctuaries and refuges	X		
2. Wetlands *(EA Section 4.13)*		X	
3. Mud flats	X		
4. Vegetated shallows	X		
5. Coral reefs	X		
6. Riffle and pool complexes	X		
Subpart F, Section 230.50-230.55: Potential Effects on Human Use Characteristics			
1. Municipal and private water supplies	X		
2. Recreational and commercial fisheries *(EA Sections 4.8 and 4.10)*	X		

Evaluation Factor	Not Applicable[1]	Not Significant	Significant
3. Water-related recreation *(EA Section 4.10)*		X	
4. Aesthetics *(EA Section 4.1)*		X	
5. Parks, national and historic monuments, national seashores, wilderness areas, research sites, and similar preserves *(EA Sections 4.3 and 4.10)*	X		

Note:
1. "Not Applicable" indicates that the resource is not present or there would be no adverse impact.

5.1 Evaluation and Testing (Subpart G)

In the past, sediment samples from the Crescent City Harbor federal channels have been subjected to a comprehensive suite of physical, conventional, and chemical analyses and biological tests based on applicable guidelines established in the Inland Testing Manual (USEPA/USACE 1998), the Ocean Testing Manual (USEPA/USACE 1991), the Upland Testing Manual (USACE 2003), and the Sediment Evaluation Framework for the Pacific Northwest (USACE et al. 2009). The sediment chemistry and toxicity data produced from previous sampling events indicated that sediment from all three channels has met criteria specified by the various placement options (upland or ocean; AET 2003, USACE 2006, ADH 2009, and WS 2011). Grain size has been the only constraint to dredged material suitability for placement at Whaler Island.

Pursuant to Subpart G of the Guidelines, the potential biological availability of possible contaminants in the dredged material must be analyzed per the evaluation factors listed in ***Table 5***. Results of the analyses are based on past sediment testing results for the federal navigation channels and known sources of contamination in, or near the channels. The EA concluded that potential toxicity impacts of the Agency Preferred Plan would be less than significant. References are included to the section(s) of the EA where the background information or analysis relevant to each applicable evaluation factor is presented.

Pursuant to the Section 404(b)(1) sediment testing guidelines, sediment testing will be conducted prior to the maintenance dredging episode in 2018, per the approved sediment sampling and analysis plan and scope of work. Refer to ***Section 4.6.2.2*** of the EA for discussion of sediment sampling and testing requirements.

Table 4. Technical evaluation factors for the Agency Preferred Plan (Subpart G)

Evaluation Factors for the Agency Preferred Plan	Not Applicable	Applicable
Subpart G: Biological Availability of Possible Contaminants in Dredged of Fill Material		
1. Physical characteristics (EA Section 4.5.1.2)		X
2. Hydrogeography in relation to known or anticipated sources of contaminants (EA Sections 4.6.1 and 4.7.2.2)		X
3. Results from previous testing of the material or similar material in the vicinity of the project (EA Sections 4.5.1.2 and 4.6.1)		X
4. Known, significant sources of persistent pesticides from land runoff or percolation	X	
5. Spill records for petroleum products or designated hazardous substances (EA Sections 4.6.1 and 4.6.2.2)		X
6. Public records of significant introduction of contaminants from industries, municipalities, or other sources	X	
7. Known existence of substantial material deposits of substances which could be released in harmful quantities to the aquatic environment by man induced discharge activities (EA Sections 4.6.1 and 4.6.2.2)	X	
8. Other sources (specify)	X	

5.2 Actions Taken to Minimize Adverse Effects (Subpart H)

Under the Agency Preferred Plan, best management practices would be employed to minimize potential impacts to water quality and fish resources. These include:

- To ensure that contaminants are not accidently introduced into the waterway, the contractor would implement standard erosion and sediment controls and spill prevention and response measures in and around the proposed project area. The contractor responsible for operating the dredging equipment would be responsible for ensuring that such measures are adhered to.
- Floating debris will be removed from the water and disposed of properly.
- All dredged material will be handled and transported such that it does not re-enter surface waters outside of the protected immediate work area.
- Dredging at each project location will continue to be limited to the approved project depth plus allowable overdepth.
- Mechanical dredging measures:

- Multiple horizontal dredge cuts will be taken where a thick horizontal volume needs to be dredged, in order to avoid overfilling the bucket and causing spillage.
- No overflow or decant water will be allowed to be discharged from any barge, with the exception of spillage incidental to clamshell dredge operations.

- Hydraulic dredging measures:
  - Pipeline pumps will only be turned on when the cutterhead intakes are on the seafloor or within 3 feet of the seafloor when priming pumps.
  - Cutterhead intakes will be monitored so that they maintain positive contact with the seafloor during suction dredging.

5.2.1 Cultural Resources Mitigation Measures

Given the absence of know historic or cultural resource in the project area and the disturbed nature of the existing federal channel no effect to cultural or historic resources is expected. Mitigation Measure (MM)-CR-01 is proposed to avoid effects due to inadvertent discovery of such resources.

- **MM-CR-01**: If an inadvertent discovery is made USACE would immediately halt all soil- and sediment-disturbing activities within the area of the find, as appropriate. Prehistoric cultural material includes, but is not limited to: chert or obsidian flakes, projectile points, mortars, and pestles, dark friable soil containing shell and bone dietary debris, heat-affected rock, human burials, shell midden deposits, hearth remains, and stone and/or shell artifacts. Historic material that may occur within aquatic environments, includes but is not limited to, ship remains, maritime-related structures and remains with square nails, whole or fragmentary ceramic, glass or metal objects, wood, nails, brick, anchors, barge remnants, dumpsites, or other materials. A USACE archaeologist or other qualified archaeologist would then ascertain the nature of the discovery, the significance of the find, and provide proper management recommendations.

5.2.2 Threatened and Endangered Species

The Environmental Assessment for the project identified appropriate mitigation measures to avoid or minimize potential impacts on state or federal threatened or endangered species, critical habitats, and other special status species and habitats. The following mitigation measures are proposed as part of the Proposed Action (Agency Preferred Plan) to avoid/minimize potential impacts to the EndangeredWestern lily:

- **MM-TE-01**: ***Appendix A*** (to the Environmental Assessment) describes the monitoring and response plan that will be implemented to verify there will be no adverse impacts to Western lily habitat. Daily observations will be made during dredging to determine whether flow through the culverts under U.S. Highway 101 is being impeded by accumulation of material on the downstream portions of the beach. If it is determined that flow is being impeded, the contractor will be required to contact the USACE in order to determine a corrective course of action.

- **MM-TE-02**: The California Regional Water Quality Control Board (CRWQB) Monitoring and Reporting Program No. R1-2000-59 (Revised December 30, 2004) for Crescent City Harbor District Maintenance Dredging requirements, including effluent and receiving water monitoring at Whaler Island during placement and an annual biological survey the summer following placement, will be followed during dredging and placement activities. All appropriate and practicable steps have also been taken, through application of recommendations listed in Sections 230.70 through 230.77 of the Guidelines to ensure minimal adverse effects of the proposed discharge.

5.3 Factual Determination (Section 230.11)

As stated in the Guidelines, the permitting authority shall determine the potential short term or long-term effects of a proposed discharge of dredged or fill material on the physical, chemical, and biological components of the aquatic environment in light of subparts C through F. Such factual determinations shall be used in making findings of compliance or non-compliance per Section 230.12. The evaluation and testing procedures described in Subpart G shall also be used as necessary to make such determinations.

Review of Subparts C through F (Section 5), Subpart G (Section 6), and Subpart H (Section 7) indicates that the Agency Preferred Plan will result in potential for minimal short- or long-term environmental effects, as follows:

a.	Physical substrate	Yes	No
b.	Water circulation, fluctuation, and salinity	Yes	No
c.	Suspended particulates/turbidity	Yes	No
d.	Contaminant availability	Yes	No
e.	Aquatic ecosystem structure, function, and organisms	Yes	No
f.	Proposed placement site	Yes	No
g.	Cumulative effects on the aquatic ecosystem	Yes	No
h.	Secondary effects on the aquatic ecosystem	Yes	No

5.4 Findings of Compliance or Non-compliance (Section 230.10 [A]-[D])

a.	The discharge represents the least environmentally damaging practicable alternative and if in a special aquatic site, the activity associated with the discharge must have direct access or proximity to, or be located in the aquatic ecosystem to fulfill its basic purpose.	Yes	No
b.	The activity does not appear to: 1) violate applicable state water quality standards or effluent standards prohibited under Section 307 of the CWA; 2) jeopardize the existence of federally listed threatened and endangered species or their critical habitat; and 3) violate requirements of any federally designated marine sanctuary.	Yes	No
c.	The activity will not cause or contribute to significant degradation of waters of the U.S., including adverse effects on human health, life stages of organisms dependent on the aquatic ecosystem, ecosystem diversity, productivity and stability, and recreational, aesthetic, and economic values.	Yes	No
d.	Appropriate and practicable steps have been taken to minimize potential adverse impacts of the discharge on the aquatic ecosystem.	Yes	No

Based on compliance with Section 230.10(A-D), the Agency Preferred Plan for discharge of dredged or fill material complies with Section 404(b)(1) guidelines.

6 References

ADH (ADH Environmental), 2009. Crescent City Harbor Federal Channels 2009 Maintenance Dredging Sampling and Analysis Report. Prepared for U.S. Army Corps of Engineers, San Francisco District. December 14, 2009.

AET (Applied Environmental Technologies, Inc.), 2003. Sampling and Analysis for Dredging Crescent City Harbor District, Crescent City, California. January 2003.

HydroPlan and Anchor QEA, LLC, 2015. Crescent City Harbor Dredged Material Management Plan, Appendix D, Public Meeting Summary, Section 3.2, Comments/Questions. February 11, 2015.

USACE (U.S. Army Corps of Engineers), 2003. Evaluation of Dredged Material Proposed for Disposal at Island, Nearshore, or Upland Confined Disposal Facilities – Testing Manual. Technical Report ERDC/EL TR-03-1. January 2003.

USACE, 2006. Draft Crescent City Harbor Dredged Material Management Plan (DMMP) Report. U.S. Army Corps of Engineers, San Francisco District. February 2006.

USACE et al., 2009. Sediment Evaluation Framework for the Pacific Northwest. U.S. Army Corps of Engineers, U.S. Environmental Protection Agency, Washington Department of Ecology, Washington Department of Natural Resources, Oregon Department of Environmental Quality, Idaho Department of Environmental Quality, National Marine Fisheries Service, and U.S. Fish and Wildlife Service. May 2009.

USEPA/USACE (U.S. Environmental Protection Agency and U.S. Army Corps of Engineers), 1991. Evaluation of Dredged Material Proposed for Ocean Disposal – Testing Manual. USEPA 503/8-91/001. February 1991.

USEPA/USACE, 1998. Evaluation of Dredged Material Proposed for Discharge in Waters of the U.S. February 1998.

WS (Weston Solutions, Inc.), 2011. Results of Chemical, Physical and Biological Testing of Sediments from Crescent City Harbor. August 17, 2011.

_____ _____

DATE DISTRICT COMMANDER

USACE, 2006. Draft Crescent City Harbor Dredged Material Management Plan (DMMP) Report. U.S. Army Corps of Engineers, San Francisco District. February 2006.

USACE et al., 2009. Sediment Evaluation Framework for the Pacific Northwest. U.S. Army Corps of Engineers, U.S. Environmental Protection Agency, Washington Department of Ecology, Washington Department of Natural Resources, Oregon Department of Environmental Quality, Idaho Department of Environmental Quality, National Marine Fisheries Service, and U.S. Fish and Wildlife Service. May 2009.

USEPA/USACE (U.S. Environmental Protection Agency and U.S. Army Corps of Engineers), 1991. Evaluation of Dredged Material Proposed for Ocean Disposal – Testing Manual. USEPA 503/8-91/001. February 1991.

USEPA/USACE, 1998. Evaluation of Dredged Material Proposed for Discharge in Waters of the U.S. February 1998.

WS (Weston Solutions, Inc.), 2011. Results of Chemical, Physical and Biological Testing of Sediments from Crescent City Harbor. August 17, 2011.

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DATE DISTRICT COMMANDER

404(b)(1) ATTACHMENT A

California Regional Water Quality Control Board
North Coast Region

Monitoring and Reporting Program No. R1-2000-59
(Revised December 30, 2004)

for

Crescent City Harbor District
Maintenance Dredging

Del Norte County

The purpose of this monitoring program is to demonstrate that the requirements of Order No. R1-2000-59 are being met. The program calls for routine monitoring at regular intervals during and following dredging operations.

Dredging Records

Dredging activity shall be reported daily as "none" if the dredge is inactive, or "pond" if the dredge is placing spoil in the pond, or "beach" if the dredge is placing spoil at the Whaler Island disposal site.

Effluent Monitoring

Effluent grab samples shall be collected daily when the dredge spoil pond overflows. Samples shall be analyzed for turbidity (as NTU) and settleable solids (as mL/L). "Dry" shall be reported in place of sample results for each day of dredging not producing dredge spoil pond overflow.

Annually, on the first day of dredge spoil pond overflow or dredge discharge to the Whaler Island disposal site during a calendar year, a chronic toxicity bioassay shall be conducted using a sample of the discharge. During the first year, test organisms shall include topsmelt *Atherinops affinis*, red abalone *Haliotis rufescens*, and giant kelp *Macrocystis pyrifera*. The sensitivity of these three test organisms shall be determined during the first year of testing, and subsequent chronic toxicity bioassays shall use only the critical life stage of the most sensitive of the three organisms.

Receiving Water Monitoring

Receiving water samples shall be collected daily, within one hour of high tide, when the dredge spoil pond overflows or the dredge is placing spoil at the Whaler Island disposal site. These samples shall be analyzed for turbidity. One sample shall be taken near the ice house at the end of Citizens Dock Road, and the other shall be taken within 200 feet of the point of entrance of the discharge into the Ocean.

Annual Survey

An annual biological survey of the Whaler Island disposal site shall be conducted during the summer following use of the site for dredge disposal. Observation sites shall be established – one on the seaward side the groin extending southeasterly from Whaler Island, and the other on the opposite side of the groin. For each observation site the marine biologist conducting the survey shall quantify and report the density of colonization for each marine species observed.

A physical survey by a licensed land surveyor shall be made of the beach elevations within the groin during minus tides at approximately the same time as the biological survey. A map of the survey results shall be submitted with the monitoring report for the month of the survey.

Monitoring and Records

Samples and measurements taken for the purpose of monitoring shall be representative of the monitored activity.

The discharger shall calibrate and perform maintenance procedures in accordance with manufacturer's specifications on all monitoring instruments and equipment to ensure accurate measurements.

Records of monitoring information shall include:

1. The date, exact place, and time of sampling or measurements;
2. the individuals who performed the sampling or measurements;
3. the date(s) analyses were performed;
4. the individual(s) who performed the analyses;
5. the analytical techniques or methods used;
6. the results of such analyses;
7. the method detection limit; and
8. the practical quantitation level (PQL) or the limit of quantitation (LOQ).

Unless otherwise noted, all sampling and sample preservation shall be in accordance with the current edition of "Standard Methods for the Examination of Water and Wastewater" (American Public Health Association.)

All permit applications, reports, or information submitted to the Regional Water Board shall be signed by either a principal executive officer or ranking elected official of Crescent City Harbor District.

Any person signing a document under this monitoring and reporting program shall make the following certification:

"I certify under penalty of perjury that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment."

Reporting

Monitoring reports shall be submitted to the Regional Water Board for each month on or before the last day of the following month. Reports shall be submitted on a form similar to the attached example.

Ordered by:

for Catherine E. Kuhlman
Executive Officer

December 30, 2004

ALW:js/123004_DredgingM&R

Crescent City Harbor District (ID No. 1A92024RDN)
Self-Monitoring Report for the Month of: _____, 2_____

Date	Dredging Activity	Overflow NTU	Overflow mL/L	Ice House NTU	Pond NTU	Beach NTU
1						
2						
3						
4						
5						
6						
7						
8						
9						
10						
11						
12						
13						
14						
15						
16						
17						
18						
19						
20						
21						
22						
23						
24						
25						
26						
27						
28						
29						
30						
31						

I certify under penalty of perjury that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

Signature: _____ Date: _____

APPENDIX C: Endangered Species Act Compliance

- Biological Assessment (USFWS & NMFS)
- NMFS Not Likely To Adversely Affect Concurrence Letter

BIOLOGICAL ASSESSMENT

Crescent City Harbor Federal Navigation Channels

2019 Maintenance Dredging

April 2019

U.S Army Corps of Engineers
San Francisco District
Planning Branch, Environmental Section

1 Introduction

1.1 Background

The U.S. Army Corps of Engineers (USACE) proposes to perform maintenance dredging of the existing federal navigation channels within Crescent City Harbor in Del Norte County, CA (***Figure 1***). Over time, shoaling of these navigation channels has resulted in reduced channel depths, limiting navigation especially for large commercial vessels. The purpose of the proposed project (Project) is to perform maintenance dredging within the existing navigation channels to restore them to their original authorized depths, providing continued safe and reliable commercial and recreational navigation. Maintenance dredging of the federal navigation channels has been conducted since 1936 at intervals ranging from one to seventeen years.

The Project entails dredging all three channel components within Crescent City Harbor (Outer Channel, Inner Channel, and Access Channel), thereby removing a total of approximately 118,000 cubic yards (CY) of shoaled sediment from the Harbor (including 2-feet of allowable overdepth) according to the most recent survey that was conducted 19 February 2019.

Maintenance dredging and disposal activities are proposed to take place in mid/late summer to early fall of 2019. The Crescent City Harbor District is the non-federal sponsor for the Project.

A number of federally listed species and designated critical habitats under jurisdiction of the National Marine Fisheries Services (NMFS) and the U.S. Fish and Wildlife Service (USFWS) have been documented or are suspected to occur within the Project Area, and are presented in ***Table 1*** along with a summary of effect determination.

1.2 Project Area

Crescent City Harbor (***Figure 2***) is a small commercial Harbor located on the Northern California coast, approximately 280 miles north of San Francisco and 17 miles south of the Oregon border. The Harbor occupies a natural indentation in the coastline and is protected by a manmade 4,700-foot rubble mound outer breakwater to the west; a 2,400-foot manmade sand barrier to the east; a 1,600 foot inner breakwater to the south; and the topography of the coastline to the north (***Figure 3***). Crescent City Harbor is a shallow draft federally designated Critical Harbor of Refuge, supporting a U.S. Coast Guard search and rescue station, commercial and sport fishing, waterfront industry, and recreational boating.

Elk Creek is a freshwater tributary that discharges under Highway 101 into Crescent City Harbor near the center of the Harbor's shoreline. The headwaters of Elk Creek originate in the Smith Redwood State Park, a protected and relatively intact forested area east of Crescent City. The Harbor's opening faces southeast and is approximately 2,000 feet (609 meters) across, encompassing an area of approximately 420 acres. South Beach is located east of the sand barrier to Whaler Island, extending southeastward along the coastline in between US101 and the Pacific Ocean.

HOODS is located approximately 66 miles south of Crescent City Harbor (***Figure 1***).

Figure 1. Project vicinity map

Table 1. Species with potential to occur within the project vicinity

Common Name	Scientific Name	Federal Status	Juris-diction	Potential to Occur in Action Area	Effect Determi-nation ^
BIRDS					
Marbled murrelet	*Brachyramphus marmoratus*	Threatened	USFWS	Uplands/nearshore/open ocean. Potential to utilize marine and Harbor portion of Action Area.	NLAA
Northern Spotted owl	*Strix occidentalis caurina*	Threatened	USFWS	Forested uplands. No suitable forested habitat within Action Area. Not documented to utilize marine or estuarine areas.	NE
Short-Tailed albatross	*Phoebastria albatrus*	Endangered	USFWS	Nearshore/open ocean. Limited sightings on west coast US, possible transient or at-sea foraging.	NE
Western snowy plover	*Charadrius nivosus*	Threatened	USFWS	Beach areas, dunes. Potentially suitable habitat at South Beach but USFWS surveys have not recorded use of beach.	NE
Yellow-Billed Cuckoo	*Coccyzus americanus*	Threatened	USFWS	Mature deciduous riparian areas. No suitable habitat within Action Area.	NE
FISH					
Eulachon	*Thaleichthys pacificus*	Threatened	NMFS	Freshwater/estuarine/ nearshore/open ocean. Documented runs north of Action Area in Smith River, no documented spawning in Elk Creek. Limited or transient use in Harbor possible but unlikely.	NE
North American green sturgeon	*Acipenser medirostris*	Threatened	NMFS	Freshwater/estuarine/ nearshore/open ocean. May forage within Harbor or immediately offshore.	NLAA
Southern Oregon/Northern California Coast coho salmon	*Oncorhynchus kisutch*	Threatened	NMFS	Freshwater/estuarine/ nearshore/open ocean Documented to occur in Elk Creek, Harbor nearshore and open oceans environments	NLAA
Tidewater goby	*Eucyclogobius newberryi*	Endangered	NMFS	Estuarine/nearshore. Documented to occur within Elk Creek shallow water habitats	NLAA
INVERTEBRATES					
Oregon Silverspot butterfly	*Speyeria zerene hippolyta*	Threatened	USFWS	Uplands	NE

Common Name	Scientific Name	Federal Status	Juris-diction	Potential to Occur in Action Area	Effect Determi-nation ^
MAMMALS					
Steller sea lion	*Eumetopias jubatus*	Threatened / MMPA	NMFS	Beaches/Rocks/Nearshore/open ocean. Documented to occur in Harbor nearshore and open oceans environments	NLAA
Southern sea otter	*Enhydra lutris nereis*	Threatened / MMPA	NMFS	Beaches/Rocks/Nearshore/open ocean	NE
Gray whale	*Eschrichtius robustus*	Endangered / MMPA	NMFS	Nearshore/open ocean	NE
Blue whale	*Balaenoptera musculus*	Endangered / MMPA Depleted	NMFS	Open Ocean	NE
Fin whale	*Balaenoptera physalus*	Endangered / MMPA Depleted	NMFS	Open Ocean	NE
Humpback whale	*Megaptera noveangliae*	Endangered (Proposed Threatened) / MMPA Depleted	NMFS	Open Ocean	NE
Sei whale	*Balaenoptera borealis*	Endangered / MMPA Depleted	NMFS	Open Ocean	NE
REPTILES					
Loggerhead turtle	*Caretta caretta*	Threatened	NMFS	Open Ocean	NE
Green turtle	*Chelonia mydas*	Endangered	NMFS	Open Ocean	NE
Leatherback turtle	*Dermochelys coriacea*	Endangered	NMFS	Open Ocean	NE
Olive (Pacific) ridley	*Lepidochelys olivecea*	Endangered	NMFS	Open Ocean	NE
PLANTS					
Western Lily	*Lilium occidentale*	Endangered	USFWS	Uplands/wetlands. Largest known population occurs in coastal wetland complex immediately southeast of Harbor and east of Highway 101	NLAA

^ NE = No Effect; NLAA = Not Likely to Adversely Affect.

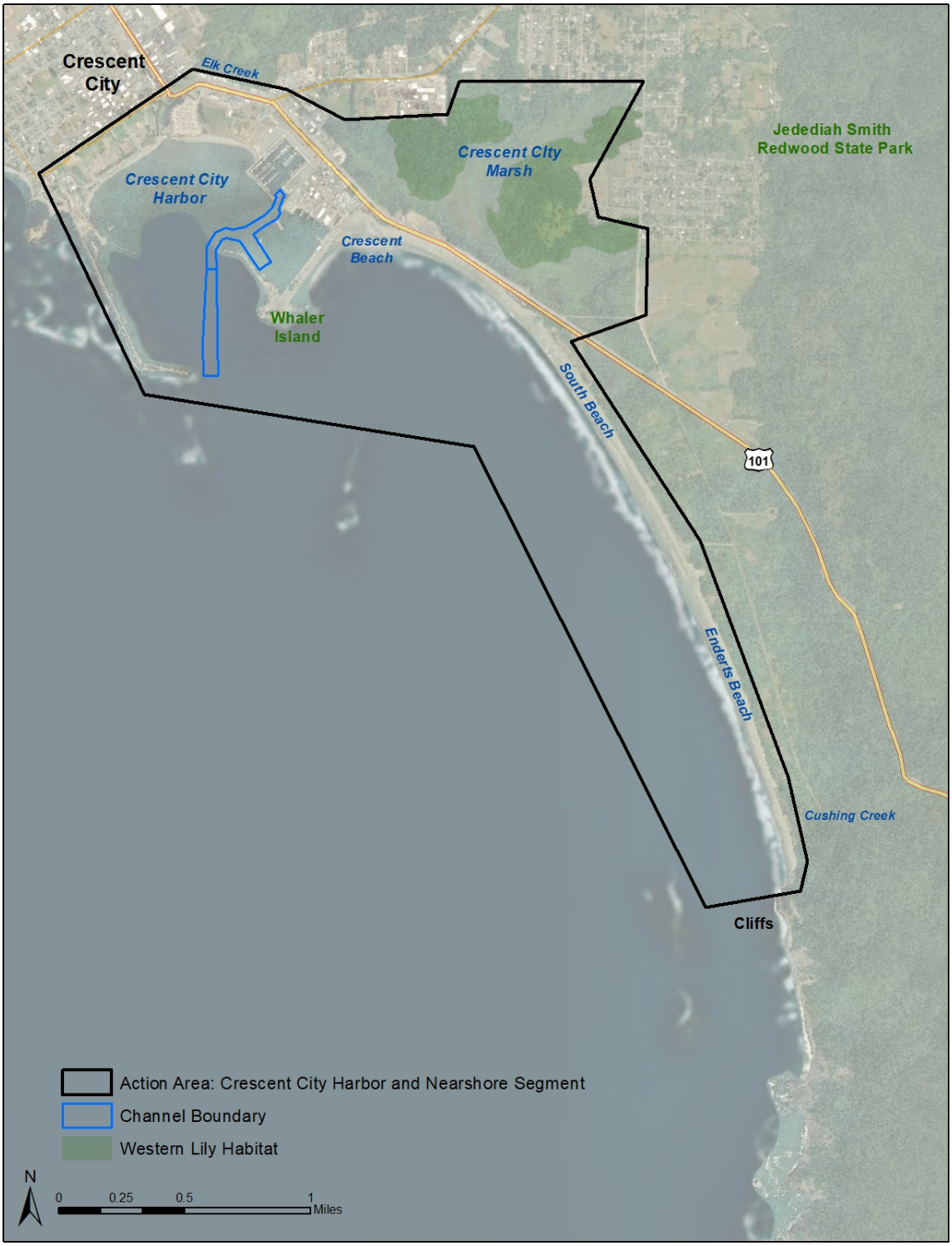

Figure 2. Crescent City Harbor Action Area

Figure 3. Project area detail

1.3 Project History

1.3.1 Documentation of Relevant Correspondence

1. 2016. An Administrative Draft Environmental Assessment was prepared for the USACE in 2016 (HydroPlan and Anchor QEA, 2016).
2. 2015. A Dredged Material Management Plan (DMMP) was prepared for Crescent City Harbor in 2015 (HydroPlan and Anchor QEA 2015). The purpose of the DMMP was to evaluate alternatives and recommend a plan for management of dredged material for the next 20 years or more of maintenance dredging.
3. 2009. Letter from USFWS to the California Coastal Commission Staff regarding the Consistency Determination Concurrence for potential effects to the Western lily from the proposed action. (USFWS 2009a)
4. 2009. California Coastal Commission Staff Recommendation on Consistency Determination Concurrence. (California Coastal Commission 2009)

1.3.2 Federal Action History

The Crescent City Harbor Entrance and Inner Harbor Basin Channels were first dredged under the USACE O&M Program in 1936. Since that time, maintenance dredging of the two channels has been conducted in 1937, 1938, 1939, 1956, 1957, 1964, 1965, 1976, 1982, 1983, 1988, 1993, and 1998, at intervals ranging from one to seventeen years between episodes. In 1999, only the Entrance Channel was dredged and in 2000, the Access Channel was deepened and became a federal channel. The Access Channel was last dredged in 2009 and the Inner Harbor Basin and Entrance Channels were last dredged in 2011. Due to funding and placement/ disposal site capacity constraints, the Inner Harbor Basin Channel and Entrance Channel were only dredged to -14 feet MLLW (with 1 foot of overdepth) in 2011, instead of the typically maintained -15 and -20 feet MLLW, respectively.

A hopper dredge was used to dredge the channels from 1936 to 1939. After 1956, all dredging was performed with a cutterhead dredge and hydraulic pipeline, aside from the use of a hopper dredge for a portion of the channels in 1982. Based on dredged material volumes from 1936 to 2011, a total of approximately 896,600 CY has been dredged from the Crescent City Harbor federal channels. ***Table 2*** summarizes the dredged volumes from the Crescent City Harbor federal channels since 1936.

1.3.3 Consultation History

- 1998. SWR-2001-2772. Crescent City Harbor Federal Channel Extension and Deepening Project. Informal combined. Arcata, CA NMFS Office. Project put on hold, no resolution as of 8/6/1998 (per J. Ambrosius). NMFS response date: 8/06/1998.

Table 2. Crescent City Harbor Federal Channels historical maintenance dredging volumes and disposal sites

Year	Channels	Volume (CY)	Disposal Site
1936	Inner Harbor Basin and Entrance Channels	48,449	Unknown
1937	Inner Harbor Basin and Entrance Channels	27,756	Unknown
1938	Inner Harbor Basin and Entrance Channels	16,353	Unknown
1939	Inner Harbor Basin and Entrance Channels	58,396	Unknown
1956/1957	Inner Harbor Basin and Entrance Channels	120,466	Unknown
1964/1965	Inner Harbor Basin and Entrance Channels	187,372[b]	Unknown
1976	Inner Harbor Basin and Entrance Channels	61,013	SF-1
1982	Inner Harbor Basin and Entrance Channels	125,319	SF-1
1983	Inner Harbor Basin and Entrance Channels	40,221	SF-1
1988	Inner Harbor Basin and Entrance Channels	62,192	Whaler Island
1990	HOODS established	NA	NA
1993	Inner Harbor Basin and Entrance Channels	37,487	Whaler Island
1999/2000	Entrance Channel and Access Channel	35,000	Whaler Island & Dredge Ponds
2002	Crescent City Floating Dock Relocation	NA	NA
2005	USCG Dorado Moorings Repair	NA	NA
2009	Access Channel	34,947	Whaler Island & Dredge Ponds
2011	Various Tsunami related repairs (boat basin/docks)	NA	NA
2011[a]	Inner Harbor Basin and Entrance Channels	41,630	Whaler Island & Dredge Ponds
Total		**896,601**	

Note:

a. Due to funding and placement/disposal site capacity constraints, the Inner Harbor Basin and Entrance channels were only dredged to -14 feet MLLW (with 1 foot of overdepth) in 2011, instead of the typically maintained -15 and -20 feet MLLW, respectively.

b. The 1964 tsunami may have contributed to the larger than usual volume.

2 Description of Action and Action Area

2.1 Federal Action and Legal Authority

Interagency coordination, as defined in Section 7 of the Endangered Species Act (ESA), requires all federal agencies to consult with the USFWS and NMFS, collectively referred to as the Services, if a federal action agency determines that any action it funds, authorizes, or carries

out may affect an ESA-listed species or designated critical habitat. The USACE is preparing this Biological Assessment (BA) because the project is proposed for federal funding, will impact a water of the U.S., and may affect federally listed species under the jurisdiction of NMFS and USFWS. The purpose of this BA is to evaluate the effects of the project on species under the jurisdiction of the NMFS and USFWS that are listed or proposed for listing under the ESA. This BA also evaluates potential impacts to Essential Fish Habitat (EFH), as defined by the Magnuson-Stevens Fishery Conservation and Management Act as amended by the Sustainable Fisheries Act of 1996.

2.2 Project Purpose and Objectives

The USACE proposes to conduct maintenance dredging of the Crescent City Harbor Federal Navigation Channels for the purpose of restoring them to their original authorized depths. The Project entails dredging the Outer Channel (also referred to as the Entrance Channel), Inner Channel, and Access Channel (***Figure 3***), with the purpose being to return these channels to their authorized depths for safe and reliable commercial and recreational navigation. The dredged material will be disposed of at approved dredged material placement sites, including either the existing upland disposal site (if it can be excavated) or HOODS for the fine material, and Whaler Island, the nearshore beach nourishment placement location, for sandy material. Construction is proposed to occur in 2019.

The existing federal project for the improvement of the Crescent City Harbor was authorized by the Rivers and Harbors Act of 1918, based on the report printed in House Document 434 of the 64th Congress, First Session, and provided for construction of a rubble mound outer breakwater. The Crescent City Harbor District is the non-federal sponsor for the project.

2.3 Project Description

2.3.1 Description of Project Activities

USACE proposes to conduct maintenance dredging of the existing federal navigation channels within Crescent City Harbor to their authorized depths. There are currently three federally constructed and maintained navigation channels in Crescent City Harbor. The Inner Harbor Basin Channel extends 2,200 feet (670 meters) along the inside and around the tip of the inner breakwater, where it connects to the Entrance Channel, a 200-foot (61 meters) wide channel that extends 2,200 feet (670 meters) to the outer breakwater. The Marina Access Channel is 140-210 feet (42-64 meters) wide and extends 1,200 feet (365 meters) from the Inner Harbor Basin Channel to the small boat basin.

Each of the three channels is authorized to a depth of -20 feet mean lower low water (MLLW), with the Entrance Channel maintained to -20 feet MLLW, and the Inner Harbor Basin and Access Channel each maintained to -15 feet MLLW. To maintain these depths efficiently, project authorization also includes an additional 2 feet (0.6 meters) of allowable overdepth.

The proposed action involves using a cutterhead dredge and hydraulic pipeline to pump up to 95,000 CY of sandy sediment from the Entrance Channel and Marina Access Channel to be placed nearshore off of Whaler Island. A clamshell dredge would excavate up to 23,000 CY of siltier sediment from the Inner Harbor Basin, with this material being taken to Humboldt Open Ocean Disposal Site (HOODS) for disposal. The total amount of dredged material, therefore, is 95,000 + 23,000 = 118,000 CY (these estimates include two feet of allowable overdepth).

The project footprint of the proposed dredged area, including the Entrance, Inner and Access Channels, is approximately 26 acres. The total area for the dredged material placement site at Whaler Island is 5.5 acres, whereas potentially, the total acreage available at the HOODS disposal site is 850 acres.

Hydraulic (Cutterhead) Dredging

Sandy sediment proposed to be placed at the Whaler Island beach nourishment site would be dredged primarily from the Entrance Channel by a 1,500 to 2,500 horsepower hydraulic cutterhead suction dredge. A hydraulic dredge is a barge-type vessel that consists of onboard pump(s), spud piles (long vertical pipes), and a toothed cutterhead attached to a pipeline. The cutterhead is mounted to a ladder that can be lowered, raised, and angled to target material for dredging. The transport pipeline exits the back (stern) of the dredge.

Once the dredge is positioned, the ladder with cutterhead is lowered to the bottom of the channel. The cutterhead would then slowly start to rotate and break up sediment along the seafloor, continuing from side to side in a sweeping arc. The hydraulic dredge would move along the channel, self-propelled by walking with its spuds or controlled by tugboat, and a crew would maintain and operate the dredging equipment at all times. Skiffs and a tugboat (with a total of about 500 horsepower) would be used for crew transport, maintenance, and other operations associated with dredging activities.

The dredged slurry is expected to consist of 80 to 90% water and 10 to 20% solids by volume. This ratio is dependent upon several factors, such as physical characteristics of the dredged material, thickness of dredge cuts (e.g., thin cuts result in more water and less sediment), and transport distance.

The dredge pipeline would transport dredged slurry to the Whaler Island beach nourishment site. The pipeline would be made of durable polyvinyl chloride (PVC) pipe or steel and would likely float on pontoons or floats. Depending on which areas are being dredged, the length of the pipeline would range from 1,500 to 3,000 feet (457-914 meters). If navigational access over the pipeline is required, one or more sections of the pipeline system can be submerged and anchored to the bottom of the seafloor. Pipeline sections and anchors not in use would either be secured on a floating barge, capped and lashed together to float in the channel, or stored in designated staging areas. One booster pump may be needed to accommodate the maximum pumping distance. The contractor would determine the preferred route for the pipeline from

the dredge site to the placement site, and buoys would be positioned to warn boaters of the pipeline's presence. The hydraulic dredging duration is estimated to be approximately 6 weeks.

Mechanical (Clamshell) Dredging

Fine-grained silty sediment dredged from the Inner Harbor and sandy sediment from the Access Channels would be dredged by an approximately 500 horsepower mechanical dredge. A typical mechanical dredge consists of a crane mounted on a floating flat deck barge, with a dredging bucket (e.g., clamshell) on the end of the crane boom. The barge would have 2 to 4 spud piles to anchor the dredge, likely located at the corners. The mechanical dredge would move along the channel self-propelled by walking with its spuds or controlled by tugboat (approximately 500 horsepower), and a crew would maintain and operate the dredging equipment at all times.

Once the dredge is positioned, the spud piles would be anchored vertically into the seafloor. The mechanical dredge, typically powered by a diesel generator, would then lower and raise the dredge bucket through the water column using a series of cables and winches. The weight of the dredge bucket allows it to sink into the sediment, with the cables restricting the clamshell from falling too deep or beyond the maximum allowable overdepth. The dredge bucket is then closed, raised up through the water column, and swung over to place material into a bottom dump or split hull barge. Unlike hydraulic dredging, little additional water is entrained by mechanical dredging equipment (LTMS 1998).

If disposal Option B is chosen, then once a haul barge is full, it would be transported by a larger tug (approx. 3,000 horsepower) 66 miles south to HOODS. The doors along the bottom of the barge would be opened, and the dredged sediment would be disposed at the site. The duration of mechanical dredging is also estimated to be about 6 weeks, to be carried out simultaneously with the hydraulic dredging.

2.3.2 Timing and Duration

For calendar year 2019, the USACE proposes to maintenance dredge the federal navigation channels at Crescent City Harbor within the environmental work window, which is July 1 – October 15, as established by the CDFW, and which USACE recognizes as a matter of comity. USACE also requests an extension of the CDFW work window to November 15, provided that heavy rains have not yet begun.

The work, from the Notice to Proceed (NTP) order to the contractor, will consist of two parts. The first part is preliminary, taking up to 8-weeks for written submittals (Environmental Protection Plan, Safety Plan, Quality Control Plan, etc.) and for mob. The second part involves in-water construction activity, both hydraulic and mechanical, and is scheduled to last up to 6 weeks. The in-water activity will consist of 3 weeks for dredging and 3 weeks for contractor survey, the clean-up of high spots, and demob.

As currently scheduled, the contract award, and NTP, is planned for early- to mid-August 2019. Because inclement weather with rough seas is expected in October, it is SPN's hope that in-water work can be completed by the end of September. Even so, SPN still seeks to extend the work window out to November 15 (barring heavy rains), and acknowledges that it may become necessary to postpone some dredging activities into calendar year 2020.

2.3.3 Description of Proposed Conservation Measures

A number of avoidance, minimization and conservation measures will be implemented as part of the proposed action in order to minimize impacts to federally listed species within the vicinity, and include:

Water Quality

The USACE will conduct water quality monitoring during dredging in accordance with the North Coast Regional Water Quality Control Board's (RWQCB's) Monitoring and Reporting Program No. R1-2000-59 (hereafter referred to as the monitoring program). The monitoring program involves:

Sampling

- On the first day that dredged material is placed at the Whaler Island site, a chronic toxicity bioassay will be conducted using a sample of the discharge.
- Receiving water samples in the vicinity of the Whaler Island site will be collected daily, within one hour of high tide, and tested for turbidity. One sample will be taken near the ice house at the end of Citizens Dock Road and the other will be taken within 200 feet (61 meters) of the point of entrance of the discharge into the Ocean.

Vessel Operations

- Vessels will be operated in compliance with all applicable regulations related to the prevention of water pollution by fuel, harmful substances, and accidental discharges. If Option B is chosen, the dredged material will be secured during transport to HOODS, with precautions in place to minimize any risk of spills.
- To ensure that contaminants are not accidently introduced into the waterway, the contractor will implement standard erosion and sediment controls and spill prevention and response measures in and around the proposed project area. The contractor responsible for operating the dredging equipment would be responsible for ensuring that such measures are adhered to.
- Floating debris will be removed from the water and disposed of properly.
- All dredged material will be handled and transported such that it does not re-enter surface waters outside of the immediate protected work area.

Dredging Activities

- Dredging at each project location will continue to be limited to the approved project depth plus allowable overdepth.
- If Option B is chosen, best management practices (BMP) for mechanical dredging will

include:
    - Multiple horizontal dredge cuts will be taken where a thick horizontal volume needs to be dredged, in order to avoid overfilling the bucket and causing spillage.
    - No overflow or decant water will be allowed to be discharged from any barge.
- Hydraulic dredging BMP measures will include:
    - Pipeline pumps will only be turned on when the cutterhead intakes are on the seafloor or within 3 feet (0.9 meters) of the seafloor when priming pumps.
    - Cutterhead intakes will be monitored so that they maintain positive contact with the seafloor during suction dredging.

Beach Aggradation

- Beach aggradation caused by placement of dredged material could in theory reduce flow from Crescent City Marsh, home of the largest remaining stand of Western lily, thereby causing an adverse impact. The Project proposes daily monitoring of the beach area downstream of the culverts that drain the marsh under Highway 101 during dredged material placement activities at Whaler Island. If it appears aggradation of the beach is interfering with flow through the culverts, a channel will be excavated from the culvert outlets, across the beach to open water. Prior to, and following placement of dredged material at Whaler Island, beach profile surveys will evaluate potential long-term changes to beach elevation in the area of the three Highway 101 culverts along the northern end of South Beach (***Appendix A – South Beach Aggradation Monitoring Plan***). Survey results will be submitted to the Arcata office of the USFWS.
- A biological survey of the Whaler Island site will be conducted during the summer following use of the site for dredged material placement. Two observation sites will be established: one on the seaward side of the groin extending southeasterly from Whaler Island, and the other on the opposite side of the groin. For each observation site, the marine biologist conducting the survey will quantify and report the density of colonization for each marine species observed.

2.4 Action Area

The Action Area (***Figures 2 and 3***) is defined as all areas that could potentially be affected by the proposed project action, and includes all physical, biological, and chemical direct and indirect effects, both direct and indirect, and is not limited to the actual work area (project footprint). Sources of disturbance that could potentially effect listed or proposed-listed species or their critical habitat and define the boundaries of the Action Area include: turbidity; sedimentation; beach aggradation; terrestrial and underwater noise; and visual disturbance.

The Action Area takes into consideration the geographic extent of effects from the proposed action that are both temporary (effects occurring during dredging/disposal activities) and longer term and/or permanent in nature (effects occurring over time, such as habitat alterations as a result of project activities). The proposed Project may result in both direct and

indirect effects resulting from dredging the navigation channels and placement of material at the dredged material placement sites. Direct and indirect effects factor into the size of the Action Area and include the geographic extent of effects resulting from the project action until they are indistinguishable from background levels.

The Action Area includes the following locations:

- Crescent City Harbor,
- Whaler Island nearshore disposal site on the southeast side of the jetty,
- South Beach from Crescent City Harbor southeast to Cushing Creek (covering Enderts Beach),
- Crescent City Marsh wetland complex upslope from South Beach southeast to the furthest of three culverts across Highway 101 (at approximately Sand Mine Rd),
- HOODS dredged material disposal site;
- The barge routes to/from Crescent City to HOODS.

2.4.1 Turbidity

As a result of the dredge and placement activities, sediment is expected to become suspended within the water column during dredging of the navigation channel, and may result in turbid water surrounding the dredge equipment and extending outward in any direction. The size, intensity, and duration of the turbidity plume will depend on the dredge method (mechanical or cutterhead), particle size of the dredged material (larger sand particles will settle faster than silt), tides and ambient turbidity levels at the time of the dredging event. Some turbidity is likely to result as material is dredged from the Crescent City Harbor. Because the Harbor is predominately surrounded by breakwater levees, the anticipated turbidity plume resulting from the dredging activities is expected to be relatively contained within the Harbor's 420 acres, though the precise direction and extent of the turbidity plume will depend primarily on the direction of currents. Turbidity from placement of dredged material at the Whaler Island placement site may be carried along the shallow water of the beach or be carried seaward depending on the direction of nearshore currents and tides. It is estimated that any turbidity would settle to background levels at a distance of 0.5 nautical mile southward and westward from the Whaler Island placement area. Similarly, the anticipated turbidity plume resulting from the disposal of dredged material at the HOODS disposal site is conservatively estimated to settle out approximately 0.5 nautical mile in each direction from the release area. Turbidity at the disposal site would be expected to be greater near the bottom.

2.4.2 Sedimentation

Sedimentation of benthic habitats within the dredged and placement/disposal sites is expected to occur to varying degrees as a result of dredging and disposal activities and may be temporary or permanent depending on the depth of material placed and ocean currents. Of the disposal/ placement sites only Whaler Island has been identified to receive a known quantity of dredged material (up to 95,000 CY) across its 5.5 acres. Less material (up to 23,000 CY) is proposed for open ocean disposal at HOODS. At HOODS, any sedimentation would be contained within the

boundary of the disposal site limits due to EPA requirements to release material within specified quadrants or cells. The total area potentially available for disposal is 850 acres at HOODS.

2.4.3 Beach Aggradation

Placement of up to 95,000 CY of sandy dredged material at Whaler Island may potentially result in beach aggradation (increased beach height) along South Beach. This portion of the Action Area extends along the shoreline from the Whaler Island Jetty southeast to approximately Cushing Creek, approximately 3.5 miles southeast along South Beach to a natural cliff formation, demarcating the southern end of South Beach. It is unlikely that beaches northwest of the Harbor would experience aggradation from placed material at Whaler Island, as any sediment movement northward would likely be interrupted by the western jetty and/or dispersed by nearshore ocean currents. Therefore the beach portion of the Action Area is limited to the Whaler Island jetty, southeastward to the cliffs south of Cushing Creek.

The low elevation wetlands on the eastern side of Highway 101 and west of Bluff Road are included in the Action Area due to the potential for effects of beach aggradation altering or impeding the hydrologic regime of small tributaries or drainages that drain these wetlands through three culverts under Highway 101. Therefore, the Action Area includes all areas potentially affected by beach aggradation (should it occur) including Crescent City Marsh, and South Beach from Whaler Island Jetty to the cliffs immediately south of Cushing Creek.

2.4.4 Terrestrial Noise

Terrestrial (or in air) noise is anticipated to result from operations of the dredge vessel in all project areas throughout the project duration while the vessel is in operation. Crescent City Harbor is an active marine harbor with moderate to high commercial and recreational vessel activity. Ambient noise from multiple shore-based receptor sites was documented to be between 67-81 decibels (dBA) (***Appendix B – Crescent City Harbor Terrestrial Noise Analysis***).

Terrestrial noise estimated from the vessel within the harbor for dredging of the navigation channels and placement at Whaler Island has been calculated at 3 dBA above ambient noise levels taken from multiple shore-based locations surrounding the Harbor (***Appendix B – Crescent City Harbor Terrestrial Noise Analysis***). Using a practical spreading loss calculator, it was determined that in-air vessel noise would attenuate to ambient noise levels approximately 71 feet (22 meters) beyond the location of the outermost noise receptor (Crescent City RV Park, at approximately 2,000 feet (609 meters) from the closest extent of the proposed dredge area or 1,000 feet [305 meters] from the shoreline). Therefore, terrestrial noise generated from the vessel within the harbor will result in an Action Area within an approximately 2,100 feet (640 meters) radius from the location of the vessels. Because noise attenuates over a much greater distance over hard surfaces such as water, terrestrial noise is assumed to attenuate to background levels approximately 1,000 feet (305 meters) landward of the harbor.

Vessel noise generated along the transport route and at the disposal sites is anticipated to be at similar levels to that of the vessel in the harbor (70-84 dBA) although in-air noise levels at sea would be anticipated to be much lower. In-air noise along the transport route and at the open ocean disposal sites will vary based on wind speed and weather conditions, however, on average, 55 - 65 dBA can be expected along nearshore and offshore areas (WSDOT 2013). Using a practical spreading loss calculator, it was determined that in-air vessel noise would attenuate to ambient noise levels at sea approximately 1,400 feet (427 meters) beyond the vessel. Therefore, the marine portion of the Action Area impacted by in-air noise is approximately 1,400 feet surrounding the vessel during transport and while disposing at HOODS.

2.4.5 Underwater Noise

Underwater noise is expected to be generated from placement of material at the proposed dredged material disposal and placement sites. Underwater noise is more difficult to quantify due to multiple variables including, vessel type and dredge equipment, dredging methodology, and fluctuating ambient underwater noise within the dredged area (Crescent City Harbor), and if Option B is chosen, at HOODS. Because Crescent City Harbor is predominately surrounded by breakwater levees, vessel noise resulting from the dredging activities is expected to be relatively confined within Crescent City Harbor's 420 acres (0.49 square nautical miles).

The extent of the vessel noise at HOODS is conservatively estimated to extend 1 nautical mile in each direction underwater from the total acreage available at the placement sites until it attenuates to background levels. As a result, the total vessel noise buffer at HOODS extends 6.45 square nautical miles. Underwater vessel noise along the transport route is expected to attenuate similarly, extending 1 nautical mile in each direction from the vessel until vessel noise attenuates to ambient background ocean noise.

2.4.6 Visual Disturbance

Existing visual disturbance within Crescent City Harbor is high to moderate because the project area is an active marine commercial and recreational port. In addition, the City of Crescent City is immediately adjacent to the harbor. Existing visual disturbance within the transport route as well as at HOODS is low, though vessels do periodically occur within the transport route and disposal sites. It is conservatively estimated that visual effects would extend approximately 0.5 miles from the vessel in the open ocean locations.

3 Status and Presence of Listed Species and Designated Critical Habitat

3.1 Species under Jurisdiction of NMFS

3.1.1 Southern Oregon/Northern California Coast Coho

The Southern Oregon/Northern California Coast (SONCC) Evolutionarily Significant Unit (ESU) of coho salmon was listed as a threatened species under the ESA in 1997, a decision that was reaffirmed in 2005. The SONCC coho Salmon ESU includes all naturally spawned populations of coho salmon in coastal streams between Cape Blanco, Oregon, and Punta Gorda, California, as well as coho salmon produced by three hatchery programs. SONCC coho within the Action Area

are considered to be within the Central Coastal Basin Stratum, which includes the population within Elk Creek.

Elk Creek likely supported much larger runs of SONCC coho, but recent spawner surveys have found very low adult returns, with one study suggesting Elk Creek supports less than 50 adults (NMFS 2014). Southern Oregon Northern California Coast coho Salmon Recovery Plan (NMFS 2014) describes the Elk Creek population as dependent on strays from nearby populations to persist over time. The Elk Creek population is considered dependent because it does not have a high likelihood of sustaining itself over a 100-year time period in isolation and receives sufficient immigration to alter its dynamics and extinction risk (NMFS 2014). Although dependent populations are not viable on their own, they do increase connectivity through dispersal among independent populations and provide individuals for other populations, acting as a source of colonists in some cases (NMFS 2014). By exchanging spawners, the Elk Creek population interacts with other Central Coastal populations, such as the Smith River population, and plays an important role in the health and status of the ESU (NMFS 2014).

Though historical numbers of SONCC coho within Elk Creek were likely much higher, the relatively small geographic extent of the Elk Creek basin would limit both the historical numbers and recovery potential for this population (NMFS 2014). Portions of historical habitat available to coho salmon in Elk Creek have been lost to development and degradation, though large portions of the Elk Creek watershed remains suitable habitat. The available habitat for both spawning and rearing SONCC coho has been severely restricted and overall opportunity and capacity within the system is low under current conditions. According to the SONCC Recovery Plan (NMFS 2014), the Elk Creek population appears to be depressed in abundance and may consist of only a handful of spawning adults each year. A spawner survey in 1999 found one coho salmon carcass in Elk Creek (NMFS 2014). The SONCC Recovery Plan estimates that there are probably fewer than 50 adults that comprise the Elk Creek SONCC coho salmon population (Brown et al. 1994, Weitkamp et al. 1995, NMFS 2014).

The presence of juveniles in the basin suggests suitable incubating conditions in reaches where coho salmon successfully spawn (NMFS 2014). Previous data from the CA Department of Fish and Game (CDFG) surveys indicate low number of juveniles (around 30 per year) distributed throughout a small portion of the basin (CDFG 2004). Only a few age 1+ smolt size coho salmon have ever been found. This indicates rearing capacity for the system may be low, or that juveniles are leaving the system earlier than expected (NMFS 2014).

With the low number of spawning adults observed in the Elk Creek population and the relatively few smolt-size juveniles found, it is likely that the Elk Creek basin supports a small but potentially consistent population with presumably low overall productivity. As a dependent population, abundance and productivity is highly influenced by nearby populations, which contribute spawners as strays (NMFS 2014). Populations to the north (Smith River) and south (Klamath River) are both likely sources of strays to the Elk Creek population. Both these populations have been severely restricted, have low numbers of returning adults compared to

historical runs, and are at moderate to high risk of extinction (NMFS 2014). Key Limiting Stresses on the Elk Creek population include 'Degraded Riparian Forest Conditions' and 'Lack of Floodplain and Channel Structure'. Key Limiting Threats are identified as 'Channelization and Diking' and 'Urban/Residential/Industrial Development'. These stressors and threats are identified as key limiting factors to recovery for SONCC coho populations within Elk Creek.

The historical extent of estuarine area in Elk Creek which include the estuarine areas of Crescent City Harbor is unknown. Currently the estuarine area of Elk Creek is confined to less than six acres of tidal sand flat south of the Hwy 101 box culvert. Based on the natural drainage pattern and elevations in the area, much of the historical estuarine tidal area likely has been dredged and filled to accommodate the highway and commercial/industrial development. The reduction in the amount of estuarine habitat and the loss of natural estuarine functions have likely resulted in a loss of foraging and growth opportunities for SONCC juveniles as well as the loss of transitional migratory habitat for smolts.

SONCC coho may be present within the Harbor or marine portions of the Action Area at any time of year. Individuals may be present within the Action Area during adult migration to Elk Creek or smolt emigration from Elk Creek or other nearby natal streams, to estuarine rearing areas within the Harbor or beyond. Adults would be anticipated to occur in the Harbor between November and January. Smolts may be present within the Elk Creek estuary year round. Spawning does not occur within the Action Area (the Action Area does not extend upstream Elk Creek beyond the estuary) and therefore eggs, fry, or juveniles are not anticipated to occur within the project Action Area.

3.1.2 North American Green Sturgeon

Green Sturgeon are large, long-lived bottom-dwelling fish that spend most of their lives in nearshore ocean environments. In 2006, NMFS issued a Final Rule to list the Southern distinct population segment (DPS) of green sturgeon as threatened under the ESA (NMFS 2006). Early life-history stages of this species (< 4 years old) reside in fresh water, with adults returning to freshwater to spawn when they are more than 15 years of age. Green sturgeon range from Mexico to Alaska in marine waters, and forage in estuaries and bays ranging from San Francisco Bay to British Columbia.

Southern DPS green sturgeon typically spawn every three to four years. Spawning occurs primarily in the Sacramento River (NMFS 2015) approximately 375 miles south of Crescent City Harbor. Sub-adult and adult North American green sturgeon spend most of their life in the coastal marine environment. Tagging data indicate that green sturgeon typically occupy depths of 66-230 feet (20-70 m) while in marine habitats (NMFS 2015). Southern DPS green sturgeon are found in high concentrations in coastal bays and estuaries along the west coast of North America during the summer and autumn, particularly in Willapa Bay, Grays Harbor, and the Columbia River estuary. Recent data indicate that the majority of these fish are either immature or in the early stages of maturation (NMFS 2015). Occurrence of this species within the Action Area is expected to be sporadic, consisting of migrating adults and/or sub-adults.

3.1.3 Steller Sea Lion, Western DPS

In 1990, NMFS listed the Steller sea lion as threatened. In 1997, NMFS reclassified the species into two DPS (NMFS 1997). The Western DPS was reclassified as endangered. The Eastern DPS remained classified as threatened until NMFS proposed to delist the Eastern DPS. The largest member of the seal family, Steller sea lions forage in near shore and pelagic waters, often hauling out on rock islands as well as manmade jetty's, buoys and other floating docks or boat ramps. Steller sea lions are opportunistic predators that forage on a variety of marine species, and their diets vary seasonally. They are also capable of traveling long distances in a season and can dive to approximately 800 - 1,300 feet (244-396) in depth. They use land habitat as haul-out sites for periods of rest, molting, and as rookeries for mating and pupping during the breeding season. At sea, they are seen alone or in small groups, but may gather in large "rafts" at the surface near rookeries and haul outs. Crescent City Harbor is known to be a haul out location but is not documented as a breeding location for this species. This species may occur within the Harbor and nearshore areas year-round.

3.2 Species under Jurisdiction of USFWS

3.2.1 Marbled Murrelet

The marbled murrelet was listed under the ESA as threatened in 1992. This small diving seabird nests exclusively in large old-growth trees with large nesting platforms up to 50 miles inland from the coastline. The marbled murrelet depends solely on a diet of fish and other marine invertebrates, diving to forage for prey before returning to their forested nest sites. In California, this species has been documented up to 14 miles out at sea from the shoreline (USDA 1995), well within the range of the two open ocean disposal sites. Breeding birds forage together at sea as bonded pairs, and may make multiple trips each day to feed young in the nests resulting in hundreds of miles each day traversing to their at sea foraging grounds. There are two occurrences of designated critical habitat within coastal forested areas east of the Action Area; Jedediah Smith Redwood State Park (2-miles from the Harbor) and Del Norte Coast Redwoods State Park (3-miles from the Harbor). While no designated critical habitat for this species is within the Action Area, this species is expected to utilize the nearshore areas within the Action Area for foraging. Given the level of boating activity at the Harbor, this species is not expected to regularly utilize the Harbor itself.

3.2.2 Tidewater Goby

The Tidewater Goby is a small fish that strictly inhabits brackish coastal water habitats entirely within California, ranging from Tillas Slough (mouth of the Smith River, Del Norte County) near the Oregon border south to Agua Hedionda Lagoon (northern San Diego County). The tidewater goby is uniquely adapted to coastal lagoons and the uppermost brackish zone of larger estuaries, rarely occupying entirely marine or freshwater habitats. This species is typically found in water less than 3.3 feet (1 meter) deep and salinities of less than 12 parts per thousand (USFWS 2006). Principal threats to the tidewater goby include loss and modification of estuarine habitat, water diversions, predatory and competitive introduced fish species,

habitat channelization, and degraded water quality (USFWS 2006). The tidewater goby is documented to occur within the Elk Creek estuarine environments and is considered to be part of the North Coast Recovery Unit (Sub-Unit NC-1).

3.2.3 Western Lily

The Western lily is a large, perennially flowering plant, listed as endangered under the ESA in 1994. This species occurs in a narrow band of coastal wetland habitat from approximately Coos Bay, OR southward to Eureka, CA. The Western lily occurs in early successional bogs or coastal scrub on poorly drained soils, usually those underlain by an iron pan or poorly permeable clay layer (USFWS 1994). Populations are found at low elevations, from almost sea level to about 300 feet (100 meters) in elevation and from ocean-facing bluffs to about 4 miles (6 kilometers) inland. The largest documented population of the Western lily occurs within the low elevation wetland complex (Crescent City Marsh) just north of Highway 101, east of the Whaler Island Jetty, and currently numbers over one thousand flowering plants (USFWS 2011). This long and narrow wetland complex extends from Elk Creek southeastward upslope of South Beach to Cushing Creek, approximately 3.5 miles southeast of the Whaler Island Jetty.

Since 1987, several populations have been eliminated, while several new populations were discovered. Of the 25 populations known to exist in 1987, more than half of those contain fewer than 50 plants. About half the current populations are located on private land, the remainder scattered on county and state lands in both Oregon and California (CSU and CDFG, 2001).

4 Environmental Baseline

Multiple habitat communities are present within the proposed Action Area and support a diverse assemblage of biotic communities.

Crescent City Harbor and Environs

Crescent City is located within the Lake Earl and Jordan Creek watershed. Drainage from the city flows through Lake Earl and Jordan Creek, in addition to other minor drainages, before discharging to the Pacific Ocean. Other minor drainages include Elk Creek, the mouth of which is within the Crescent City Harbor (City of Crescent City 2001). Elk Creek contributes sediment deposition to Crescent City Harbor, although this is believed to be a relatively minor source of sediment (HydroPlan and Anchor QEA 2015). Although Elk Creek is considered to be a high quality fisheries stream, local drainages convey urban runoff which can adversely affect water quality.

Crescent City Harbor is an active working and recreational boating harbor with a history of at least 17 federal dredging events conducted in order to create and maintain the federal navigation channels. The aquatic habitats within Crescent City Harbor include freshwater riverine, estuarine, intertidal and nearshore marine environments. Similar to other harbors, construction of the jetties and breakwaters, as well as dredging activities, has altered sediment

flow regimes and removed benthic habitat, which has contributed to the alteration and degradation of shallow-water and nearshore environments.

The estuarine environment, the brackish mixing zone within the Harbor, can be broken into two main zones: the intertidal zone and the permanently inundated deeper waters. Estuaries, including intertidal areas, provide important habitat for numerous species, both aquatic and terrestrial. Estuaries also provide critical ecosystem services, including water filtration, protection and stabilization of shorelines, and storm surge buffering, as well as providing high value habitat for species breeding, rearing, feeding, and migration (Day, et. al. 1989). Prior to the introduction of the jetties, the shallow-water estuarine areas of what is now Crescent City Harbor were once more expansive and presumably more biologically productive.

Eelgrass is an aquatic plant of estuarine and nearshore environments that extends long rhizomes (roots) an average of 1.5 – 8 inches below the substrate from which the turions (stems) sprout with long green blades (leaves). Eelgrass forms extensive mats or "beds" in shallow water estuarine areas, provides important breeding, feeding, and rearing habitat for a number of marine, anadromous and terrestrial species. Eelgrass thrives in protected coastal waters with sandy or muddy bottoms where, undisturbed, it forms dense mats of vegetation and offers a unique and important habitat for resident and migratory species.

For out-migrating salmonid smolts, eelgrass provides important shelter and foraging habitat in the smolt to ocean lifecycle of salmonids as well as numerous other aquatic species. Eelgrass also provides cover and foraging grounds for juvenile fish and in some locations, serves as a spawning ground for species such as herring. In addition, some bird and other species feed almost exclusively on eelgrass.

Eelgrass can be adversely impacted by dredging, sedimentation, or indirectly by shading from over-water structures. Eelgrass beds were once abundant throughout shallow water estuarine and marine areas across the west coast, including within Crescent City Harbor. Patches of eelgrass remain within the shallow water areas of the Harbor, but due to previous dredging, eelgrass is unlikely to occur within the federal navigation channels. It is unknown how extensive the eelgrass communities once were in the Harbor, however, due to regular maintenance dredging and ongoing Harbor activities, it is assumed the Harbor (like many other developed ports, marinas, and harbors) has experienced a significant decline in biological productivity.

The intertidal zone is the transitional zone between upland and marine environments. Located in between sandy beaches and breakwaters and the low tide line, the intertidal zone is of high biological productivity and value, serving as breeding and feeding grounds for shorebirds, anadromous fish, marine fish, intertidal vertebrates and invertebrates, shorebirds and other seagoing birds. Both marine and terrestrial mammals (such as river otters) also forage in these productive areas.

Elk Creek is a freshwater tributary that discharges into Crescent City Harbor near the center of the Harbor's shoreline. The headwaters of Elk Creek originate in the Jedediah Smith Redwood State Park, a protected and relatively intact forested area east of Crescent City. The lower middle reaches of Elk Creek flow through a large forested and emergent wetland complex, part of the Crescent City Marsh. Elk Creek then passes under Highway 101 through a 500-feet long box culvert. Downstream of the culvert is a short stretch of the creek's estuarine environment, subject to daily tidal inundation. In Elk Creek, the greatest degree of habitat alteration from development has occurred in the lower valley. Urban, residential, and industrial development within the Elk Creek Valley has resulted in a major impact on aquatic habitat (NMFS 2014). Most of the coastal wetlands and estuarine rearing habitat that might have existed in the lower basin at one time has been dredged, channelized, and/or filled (NMFS 2014). However, Elk Creek still maintains native and anadromous fish, including SONCC coho salmon (NMFS 2014).

Sandy Beaches and Dunes

Sandy beach areas and vegetated dunes occur within the Project Area within Crescent City Harbor and to the southeast of Whaler Island along South Beach. Sandy beaches and associated vegetated dunes serve as important shoreline habitat to numerous terrestrial and intertidal species. Sand and well-drained soils are the defining factor of this habitat. Plant species in these exposed coastal environments include native and non-native grasses, herbaceous vegetation, and coastal shrub species. While some areas are disturbed by development and the entire length of South Beach is cutoff from higher ground by coastal roadways, these habitat communities provide important breeding and foraging areas for resident and migratory birds, invertebrates, and mammals. Vegetated dunes can also serve to buffer higher grounds from erosive wave forces including tsunami waves.

Wetlands

Three discharge culverts are located under U.S. 101 immediately southeast of the Whaler Island Jetty. These culverts, under jurisdiction of the California Department of Transportation (Caltrans), provide drainage from upstream wetland areas. They discharge runoff from the Crescent City Marsh under U.S. 101 onto South Beach, across the sands, and into the Pacific Ocean. Crescent City Marsh is a diverse wetland complex known as the Wildlife Area and is composed of approximately 600 acres of freshwater wetlands, uplands, and coastal forests (***Figure 4***). Crescent City Marsh is a low-elevation coastal wetland complex located just southeast of Crescent City Harbor along the landward side of Highway 101, extending from Elk Creek approximately 3.15 miles southward to a natural rock outcropping formation near Cushing Creek. Approximately half of this wetland complex is owned and managed by the California Department of Fish and Game while the remainder is in private holding. This diverse wetland complex supports the largest documented population of the federally endangered Western lily in the US.

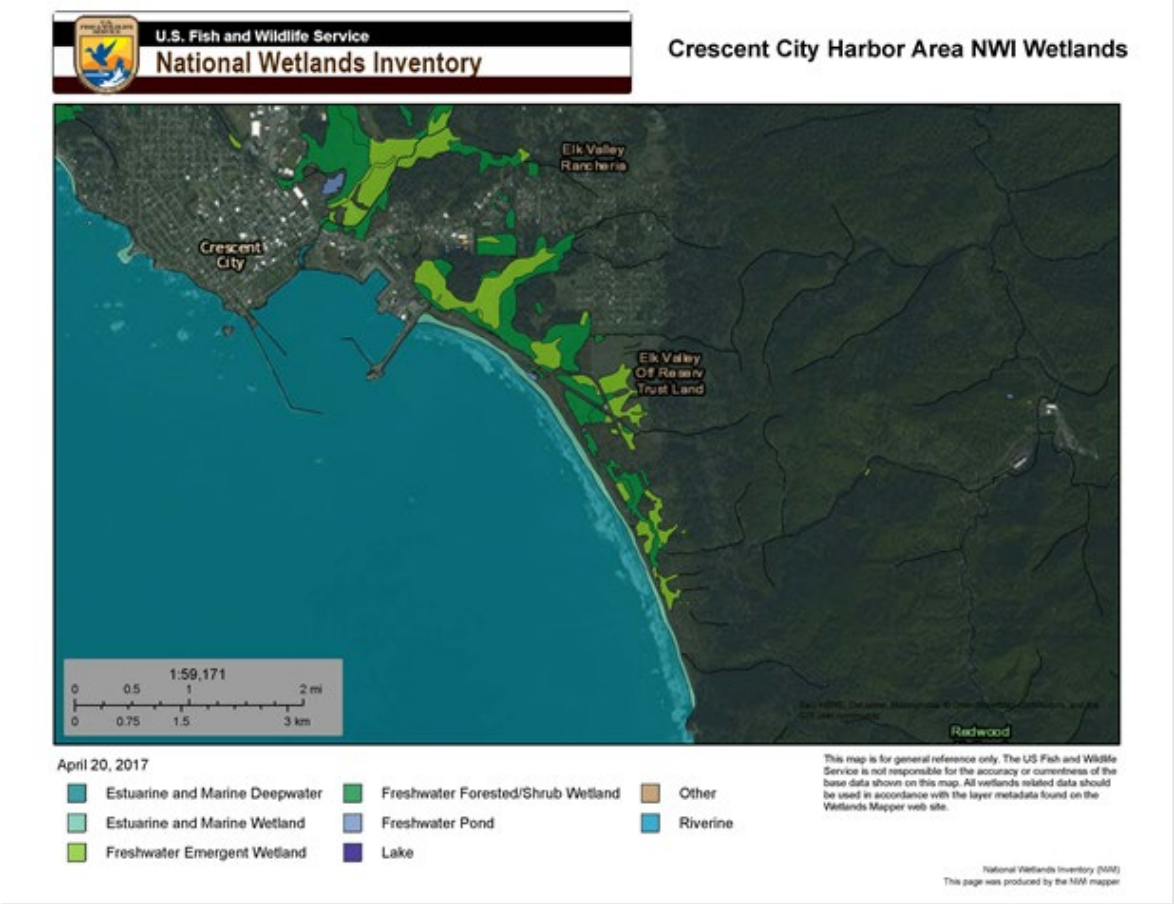

Figure 4. Wetlands in the vicinity of Crescent City Harbor

Whaler Island

Whaler Island is a natural nearshore rock formation that now makes up the southern tip of the artificial Whaler Island Jetty. The island is surrounded by estuarine and marine waters of Crescent City Harbor, and is subject to daily tidal and wave influences. The intertidal areas of the island likely support a variety of intertidal marine species, as well as serving as occasional forage grounds for seals and sea lions, shorebirds, and other seagoing birds. Its northern face (Harbor-side) is primarily composed of sparsely vegetated naturally occurring rock outcroppings with scrub-shrub and a few small conifer trees at the pinnacle of the rocks. The outcropping is artificially reinforced on the eastern, western, and northern ends. A roadway connects the island to the mainland. The jetty is protected with large rip-rap armoring on each side. The larger southern face of the island is relatively unaltered. The island is subject to winds and wave erosion. Though small in size, Whaler Island may be inhabited at various times of the year by nesting birds (migratory and resident), seals, and sea lions.

Humboldt Open Ocean Disposal Site (HOODS)

HOODS is an existing open-ocean sediment disposal site operating under the USEPA Region 9. The site is located 66 miles (57 nautical miles) south of Crescent City Harbor, approximately 3.5-4.5 miles (3 to 4 nautical miles) offshore from Eureka, CA in water depths of approximately 160-180 feet (49-55 meters). The entire area, for several miles offshore and several miles north-to-south around HOODS, is a gently sloping soft-bottom substrate without reef features or other hard-bottom outcrops (USEPA 2016a). The biological communities within HOODS are not as abundant or diverse as found in more shallow or deeper water habitats and may be the result of the fairly uniform sand bottom and/or the presence of prior placed dredged material (USEPA 2016a). The biological community within HOODS includes benthic macroinvertebrates, demersal (bottom-dwelling) fishes, polychaete, crustaceans, and mollusks. Since September 1990, HOODS has been used periodically for dredged material disposal, and in 1995 it was formally designated as an open ocean disposal site.

4.1 Crescent City Harbor – Hydrology

Crescent City is located within the Lake Earl, Jordan Creek, and Elk Creek watersheds. Drainage from the city flows through these waterbodies (with Elk Creek being only waterbody to flow into the Harbor itself) in addition to other minor drainages, before discharging to the Pacific Ocean. Although watershed conditions within the middle and upper reaches of Elk Creek are heavily forested and relatively intact, all drainages convey some urban runoff which can adversely affect water quality. The tides at Crescent City Harbor are mixed semidiurnal tides (two high and two low tides of different size every lunar day) with a great diurnal (one high and low tide per lunar day) range of 6.9 feet and a mean tide level elevation of 3.7 feet MLLW.

The wave climate offshore of Crescent City Harbor is typical of the Northern California coast, with severe storm waves generated from the northwest to the south. Based on 15 years of buoy data at a water depth of 150 feet (46 meters), typical winter waves average 9 feet (2.7 meters) in height and 12 seconds in period, while summer waves average 6 feet (1.8 meters) in height and 8 seconds in period. Winter storm waves can exceed 30 feet (9.1 meters) in height, with wave periods of up to 25 seconds (USACE 2006). The wave climate adjacent to Crescent City Harbor is milder than in the open ocean, with considerable attenuation of waves from most directions due to the surrounding breakwaters and levees. The exception involves waves arriving from the west-southwest to south-southwest, as a nearby shoal (***Figure 3***) often amplifies waves arriving from this direction by up to 30 percent of deep-water wave height (USACE 2006). The dynamics of the breakwaters and levees may contribute towards slower water circulation within the Harbor during very high or low tides or storm events.

4.2 Crescent City Harbor – Water Quality

Water quality factors of concern in Crescent City Harbor and in waters within or adjacent to placement sites include total suspended solids, turbidity, dissolved oxygen, nutrients, pH, salinity, and temperature. The Regional Water Quality Control Board (RWQCB) issues receiving

water limitations and monitoring requirements for water quality parameters during dredging to establish water quality parameters for the Project Area. For past dredging events, these were established through RWQCB Order R1-2000-59, which included a Monitoring and Reporting Program that established monitoring requirements for turbidity, settleable solids, and toxicity (***Appendix C***).

Limited water quality sampling, including modified elutriate testing (MET), was conducted in the Harbor for the 2009 Sampling and Analysis Report (USACE 2009). MET testing is valuable for determining the potential for decant water from the placement of dredged material to adversely impact receiving waters. All MET dissolved metals were reported at concentrations below the water quality objectives of the California Toxics Rule and the USEPA's Section 304(a) criteria for Priority Toxic Pollutants. MET elutriate bioassay results showed that none of the three channel samples exhibited toxicity to the mysid Americamysis bahia (small shrimp-like crustaceans) or were significantly different from the offshore reference site. Past water quality monitoring conducted by the USACE has not identified any exceedances of RWQCB water quality objectives. It is anticipated that the proposed action will have similar water quality impacts.

In the past, sediment characterization analyses have consistently confirmed that the sediment from the Crescent City Harbor federal channels is suitable for placement or disposal at the array of historical sites that have been used by USACE or the Crescent City Harbor District. However, sediment sampling and testing will be performed prior to dredging to ensure that material proposed for dredging is suitable for placement at the proposed placement/disposal sites.

The proposed action includes collecting and submitting representative samples of dredged sediments for physical, conventional, chemical, and biological testing based on applicable guidelines. Sediment samples will be collected from individual cores and composited to characterize dredge areas. Samples will be analyzed for physical and conventional parameters (grain size, total organic carbon, sulfides, and total solids); chemical parameters, including the suite of heavy metals and organic compounds tested in previous sampling events; and biological parameters, including water column toxicity and benthic bioassays. These analyses will be used to ensure that contaminated material impacts from dredging and placement of dredged material are avoided.

5 Effects of the Action

5.1 Direct Effects

Direct effects are the immediate effects of construction on the environment. Several elements of the project have the potential to directly affect listed species including: terrestrial noise, underwater noise, visual disturbance, turbidity, sedimentation, and contaminated sediments. Each of these potential effects created by project activities are discussed in detail below:

5.1.1 Terrestrial (In-Air) Noise

Project related terrestrial noise may result in temporary disturbances to listed wildlife species within the vicinity. Project related noise would be relatively continuous and not in bursts or impulsive (pile driving). Terrestrial-based noise is anticipated to result from operations of the vessel during dredging of the navigation channels, transport of material to the open ocean disposal sites, and from placement of material at Whaler Island.

Existing ambient noise levels vary greatly across the Project Area. Crescent City Harbor is an active marine harbor with existing moderate to high commercial and recreational vessel activity. As shown in ***Appendix B – Terrestrial Noise Analysis Calculations***, ambient baseline noise taken from multiple shore-based receptor sites was documented at levels between 67-81 decibels based on the A-weighted system[1] (dBA), which is considered a moderate to high noise range. As described in ***Section 2 Description of Action and Action Area***, noise generated by the dredge vessel within the Harbor is estimated to be 3 dBA above ambient noise levels, with construction noise levels anticipated at 70-84 dBA from the shoreline.

In-air noise along the transport route and at the open ocean disposal sites will vary based on wind speed and weather conditions. However, on average, 55 - 65 dBA can be expected along nearshore areas (WSDOT 2013). Vessel noise generated along the transport route and at the placement sites is anticipated to be at similar levels to that of the vessel in the Harbor (70-84 dBA). It can be assumed that the vessel would generate a similar in-air noise level range while in transport and at the HOODS disposal site.

5.1.2 Underwater Noise

Underwater noise generated by the dredge vessel and dredging activities may result in temporary disturbances to listed wildlife species within close vicinity of the vessel. Noise generated underwater from the dredge vessel and dredging activities is expected to occur during the entirety of the dredging operations (approximately 12 weeks) though noise would not be contiguous for the entirety of the project window as the dredge vessel would cease dredge operations while the barge transports material to and from the disposal sites.

Underwater noise levels generated by the dredge vessels are difficult to pinpoint due to several environmental variables including, vessel type and dredge equipment type, dredge methodology, fluctuating ambient underwater noise within the dredge area, and the open ocean placement areas. Underwater noise sampling within the Harbor or placement sites was not conducted as part of this assessment, however, an estimated range can be given based on previous analysis. Similar studies of soft-bottom dredge activities in marine harbors indicate dredge vessel noise to be less than 140 dB (Theobald et al., 2010) and may be less for soft-surface dredge operations as is the case for Crescent City Harbor. It should be noted that vessel

[1] A-weighted decibels are an expression of the relative loudness of sounds in air as perceived by the human ear. In the A-weighted system, decibel values of sounds at low frequencies are reduced, compared with unweighted decibels, in which no correction is made for audio frequency.

noise is contiguous and would not produce impact or burst noise as is associated with activities such as pile driving.

Within the Harbor, underwater noise generated from the vessel and dredge equipment is expected to be predominately contained within the bounds of the Harbor due to the breakwaters and jetties. The ambient underwater noise level in the Harbor is assumed to be moderate to high due to the existing vessel activity as well as other Harbor activities conducted year round. Therefore, the extent of underwater noise originating from the vessel would be expected to be less than the extent of underwater noise at the location of the transport route to HOODS.

5.1.3 Visual Disturbance

The presence of the dredge vessels within the Action Area may cause listed wildlife species to temporarily avoid or disperse from the area when vessels are present. Crescent City Harbor is an active marine Harbor, operating contiguously over the last 150 years with moderate to high large vessel traffic and other anthropogenic activities. Therefore, visual disturbance from presence of vessels within Crescent City Harbor is unlikely. The open ocean disposal sites and vessel transport routes are periodically utilized by other vessels, although their presence would be anticipated to be sporadic. Therefore, effects due to visual presence of the vessels may occur but would be expected to be temporary in nature.

5.1.4 Turbidity

Turbidity of waters surrounding the dredge and placement operations is likely to occur although it would be expected to be temporary in nature. Sediment is expected to become suspended within the water column during dredging of the navigation channel and placement at the dredged material placement and disposal sites and will likely result in turbid water surrounding the dredge equipment. Within Crescent City Harbor, the size, intensity, and duration of the anticipated turbidity plume will depend on particle size of the dredged material (larger sand particles will settle out faster than smaller silt particles), tide direction, and ambient turbidity levels at the time of dredging. The majority of the dredged material proposed for removal from the navigation channels is sand-sized particles proposed for placement via a pipeline at Whaler Island. Because Crescent City Harbor is predominately surrounded by breakwater levees, the anticipated turbidity plume resulting from the dredging activities is expected to be relatively contained within the Harbor. Turbidity as a result from placement at Whaler Island would be expected to be transported generally north or south along the shoreline depending on tidal direction and nearshore currents and would be expected to settle out of the water column or dissipate to ambient levels within 0.5 nautical miles of the Whaler Island placement area.

Similarly, the size, intensity, and duration of the turbidity plume at the open ocean disposal sites will depend on the size of the tides ambient turbidity levels at the time of the dredging event, as well as the quantity of material to be placed at each proposed dredged material placement site which has yet to be determined. Other factors include the height at which the

vessel will release material to the sea floor at HOODS (160-180 feet [49-55] depth range). The duration of turbid water resulting from placement of dredged material at HOODS is expected to be greater than that of Whaler Island, inasmuch as the particle size proposed for open ocean disposal is silt-sized. Turbid water resulting from disposal of dredged material at the open ocean disposal sites would be expected to return to background levels within 24 hours of completion of each disposal event.

5.1.5 Sedimentation

Some sedimentation within the Harbor is likely to occur during dredging as the dredge equipment removes sediment from the navigational channels and becomes suspended in the water column prior to resettling. The location, depth and duration of sedimentation depends on several environmental variables. As the majority of material dredged from the Harbor would either be placed on the disposal barge or pumped to the Whaler Island placement site, sedimentation is anticipated to be minimal within the Harbor and would result from suspended sediment (turbidity) resettling to the bottom. Areas of eelgrass are present within the shallow water areas of the Harbor, and could become temporarily covered in a fine layer of sediment for a short period of time (days or weeks) until tides and currents flush the area. However, it is not anticipated that eelgrass would be irreparably harmed by a fine layer of silt that does not prevent photosynthesis. No eelgrass occurs within the navigation channels as the channels have been periodically dredged for decades.

Significant sedimentation of the nearshore area at Whaler Island and the seafloor at HOODS is likely to occur immediately after disposal of the material. The sediment deposition at HOODS is likely to remain primarily within the boundary of the site limits due to EPA requirements to release material within specified quadrants or cells. Surveys conducted by USEPA indicate dredged material mounding within the bounds of the disposal site (USEPA 2016b). Benthic habitat and biological communities within the placement site could become temporarily or permanently covered in sediment permanently depending on the depth of material deposited at the disposal sites. Stationary marine benthic faunal species and/or communities may become permanently entombed by deeper layers of disposed sediment.

5.1.6 Water Quality and Contaminated Sediments

Past MET of Crescent City Harbor water found dissolved metals concentrations below the water quality criteria of the California Toxics Rule and the USEPA's Section 304(a) criteria for Priority Toxic Pollutants. MET elutriate bioassay results showed that none of the three channel samples exhibited toxicity to the mysid Americamysis bahia, or were significantly different from the offshore reference site. Past water quality monitoring conducted by the USACE has not identified any exceedances of RWQCB water quality objectives. There should not be a release of contaminants into the water column during dredging or disposal activities.

5.2 Indirect Effects

Indirect effects are defined as effects that are reasonably likely to occur later in time subsequent to project completion. The proposed project may result in the following indirect effects:

5.2.1 Beach Aggradation and Wetland Hydrology Alteration

Placement of up to 95,000 CY of sandy dredged material at Whaler Island may potentially result in beach aggradation (increased height or structure of the beach) along the adjacent South Beach. The potential for beach aggradation is not certain to occur and is dependent on several factors, including transport of sediment by tides, wave height, the structure or pitch of the nearshore shoreline, and storm events. It is expected that alteration of the beach structure or height may not necessarily occur immediately after construction, but may occur after multiple tidal cycles and/or after storm events. It would be reasonable to expect that the most likely location for beach aggradation would be near the Whaler Island placement area.

Beach aggradation at the northern edge of South Beach could potentially disrupt or impede outflow at one or more of the three culverts that drain Crescent City Marsh Wildlife Area under Highway 101. There is a great deal of uncertainty regarding the potential for indirect impacts to Western lily habitat resulting from placement of dredged material at Whaler Island. On a site visit to the area on 11 February 2015, it was observed that the outlets of the existing culverts were not obstructed and the levels of the beach sands at the time of the site visit did not appear to be impeding flow downstream of these culverts. Rather, accumulation of debris upstream of the culverts appeared to be impeding flow. Beach aggradation would not necessarily impede flow through the culverts if the flow was sufficient to maintain erosional channels across a higher beach elevation. A series of beach monitoring events are proposed in order to determine whether beach aggradation has occurred after the placement of the dredged material. In addition, mitigating measures are proposed in the event that aggradation which impedes downstream flow from the culverts occurs. Such measures are described in *Appendix A, The Crescent City Harbor Maintenance Dredging Western Lily Monitoring Plan*.

It is expected that material placed at Whaler Island would not impact the beach areas north of the Harbor, since material would be unlikely to traverse around the north jetty and any material would likely disperse seaward. Sandy depositional material would likely dissipate to background levels prior to coming ashore at the beach area between Battery Point Island and Preston Island. Anecdotal observations by residents indicate that the beach adjacent to Battery Island appears to be eroding.

5.3 Effects from Interdependent and Interrelated Actions

An interrelated activity is an action that is part of a larger action and depends on that larger action for its justification. An interdependent activity is an action that has no independent utility apart from the proposed action.

No known interrelated or interdependent actions are anticipated to occur. Commercial and recreational vessel activity to and from Crescent City Harbor is dependent upon maintenance of navigable depths within the federal navigation channels. The project proposes to dredge the existing navigation channels to their authorized depths. This action would allow for existing vessel traffic within Crescent City Harbor to continue, maintaining existing conditions within the Harbor.

5.4 Effects Determination for Listed Species and Designated Critical Habitat

5.4.1 Southern Oregon/Northern California Coastal coho Salmon

Direct effects to SONCC coho individuals within the Harbor at the time of dredging and placement of material at Whaler Island may include effects from water quality, turbidity, sedimentation of eelgrass rearing areas within the Harbor, the potential for resuspension of contaminants in the dredged sediment, and disturbance from underwater noise from vessel and dredge operations. Direct effects to SONCC coho individuals within the open-ocean disposal sites at the time of disposal activities at HOODS and may include effects from turbidity, the potential for resuspension of contaminants in the dredged sediment, and disturbance from underwater noise from vessel and disposal operations.

The project has not established a work window for the proposed work year so it is unknown if the project would occur during the window where retuning adults are present in the Harbor as they migrate towards Elk Creek (November-January). It is anticipated that smolts may be present in the Harbor year-round. Schools of adults and subadults (jacks) may be transient through HOODS, and the transport route year round.

Areas of eelgrass are present within the shallow water areas of the harbor and could become temporarily covered in a shallow layer of sediment for an unknown period of time until tides or currents flush through the area. This could temporarily disrupt smolts rearing in the estuary. The majority of the sediment dredged will be removed, however, sediments may settle out onto eelgrass beds from turbid water associated with dredging of the navigational channels.

Contaminant levels that exceed CA State water quality standards are not anticipated to be present within the dredged material above existing background levels. However, if present, contaminants within the dredged sediment could become resuspended within the water column. In accordance with the Sediment and Analysis Plan, sediment samples will be obtained prior to dredging to determine whether contaminants are present.

Underwater noise from the dredge or barge vessels could cause individuals to avoid or disperse from the area while dredging activities are occurring. Vessels would be expected to generate underwater noise levels at or below 140 dB, below the levels documented to cause harm or injury to fish (187 dB). Therefore, the vessels would not be expected to produce noise levels that would induce injury or harm, but would be expected to induce a behavioral response.

Turbidity associated with dredged material disposal may temporarily displace individuals present within the turbidity plume, increase susceptibility to predation, and cause individuals to avoid the area while the turbidity is present. Individuals present within the Harbor may avoid or be temporarily displaced from the area of the turbidity plume. Suspended solids in estuarine waters effect juvenile salmon and could reduce their ability to sight-feed on surface and near surface invertebrates (USACE 2008). Turbidity is expected to return to background levels within or under 24-hours after each dredging event over the course of the 12-week project window.

The open ocean disposal areas are in deeper water where adults and/or subadults would be expected to be migratory or transient while at sea. The disposal sites are not confined and are not utilized by smaller less mobile smolts and deeper marine waters are not used for rearing. It is likely that SONCC coho individuals within the vicinity of HOODS would avoid areas of high turbidity over the course of several disposal events, and would experience minor effects from turbidity.

5.4.2 North American Green Sturgeon

The North American green sturgeon may occur in the Harbor and/or marine portions of the Action Area during migration or foraging, as either adults or subadults. There is no documented spawning habitat within the Action Area for this species. Direct effects to the green sturgeon would be limited to water quality impacts from turbidity, sedimentation of forage areas, resuspension of contaminants in the dredged sediment, and disturbance from underwater noise from vessel and dredge operations. This benthic foraging species would likely avoid the shallow and heavy vessel traffic areas of the Harbor but may utilize the deeper navigational channels and outer harbor for foraging. Green Sturgeon may also occur within the vicinity of HOODS.

Turbidity associated with dredged material placement can temporarily interfere with the species' visual foraging, increase susceptibility to predation, and may temporarily interfere with migratory behavior. If this species is present within the vicinity of the navigational channels or proposed placement or disposal sites, any green sturgeon present may avoid or be temporarily displaced from the vicinity of the dredge equipment and turbidity. Placement of the dredged material will likely interfere with foraging in the area of sediment deposition. Effects to the green sturgeon from turbidity would be of limited duration, as would effects from sedimentation given the highly migratory nature of this species. Based on prior sampling and testing, contaminant levels that exceed CA State water quality standards are not expected to be present within the dredged material above existing background levels. Prior to the 2019 maintenance dredging episode, sediment sampling will be conducted. If contaminants are found within the dredged sediment, they could become resuspended within the water column during dredging.

5.4.3 Stellar Sea Lion

Steller sea lions are likely to be present within Crescent City Harbor and in nearshore areas, including the disposal sites and transport routes, at all times of the year. Due to the baseline

anthropogenic activity levels within Crescent City Harbor, Steller sea lions within Crescent City Harbor would likely be accustomed to moderate levels of vessel traffic and would likely avoid the dredge vessel or be temporarily displaced from the vicinity if they are within the area of the navigational channels.

Crescent City Harbor is known to be a haul out location of the Steller sea lion but is not documented as a breeding location for this species. Very young and less mobile pups are unlikely to be present within the Harbor. Similarly, individuals or groups out at sea within the vessel transport route or within vicinity of HOODS would also likely avoid the dredge vessel or be temporarily displaced from the vicinity. Given the highly mobile nature of this species, effects are expected to be minimal and limited to avoidance of the dredge and disposal areas and temporary displacement from the immediate vicinity of project actions.

5.4.4 Marbled Murrelet

There are two occurrences of designated critical habitat within the dense coastal forested areas just east of the Action Area, within Smith Redwood State Park (2-miles east of the Harbor) and within Del Norte Coast Redwoods State Park (3-miles southeast of the Harbor). While no designated critical habitat for the marbled murrelet is present within the Action Area, this species is expected to be present year round within nearshore areas of the Action Area while foraging in nearshore to offshore areas. Due to the baseline anthropogenic activity levels within Crescent City Harbor, the marbled murrelet would not be expected to forage within the Harbor, but is likely to occur within the vicinity of HOODS during forage trips.

Assuming dredging and disposal Option B is chosen, the haul barge will require several round trips to HOODS in order to dispose of material over the 12 week projected project timeline. The in-air decibel level generated by the vessel is estimated between 70-84 dBA and the underwater noise level is estimated at 140 dB sound exposure level (SEL)[2]. Marbled murrelets typically forage at sea in mated pairs. Individuals would likely avoid the area occupied by the vessel to a distance where their vocalization to their mates or other birds are not masked by vessel noise. Continuous noise of sufficient intensity in the frequency region of bird hearing can have a detrimental effect on the detection and discrimination of vocal signals by birds (Caltrans, 2007). Underwater noise generated by the dredge vessels may also affect diving marbled murrelets, however, dredge vessels are not anticipated to generate sound levels that would lead to injury (202 dB SEL). It is more likely that the vessel will produce underwater noise that would lead to behavioral effects, including flushing and avoidance of the immediate vicinity of the dredge vessel. It is expected that marbled murrelets periodically encounter other vessels at sea within their foraging areas and avoidance behaviors from vessels is likely common. Effects to the marbled murrelet would primarily involve avoidance of vessels, flushing of foraging pairs

[2] Sound exposure level (SEL) is a logarithmic measure of the sound exposure of a sound relative to a reference value.

or individuals from feeding grounds, and temporary masking of mated pair vocalizations within the Action Area surrounding the disposal sites and transport route.

5.4.5 Tidewater Goby

The tidewater goby may be present within the brackish waters of the Elk Creek estuary at any time of year. Tidewater goby may occur in these areas as either adults or juveniles. The brackish Elk Creek estuary is documented to support the tidewater goby. Direct effects to the tidewater goby would be limited to water quality impacts from turbidity, sedimentation of shallow water estuarine habitats, and disturbance from underwater noise from vessel and dredge operations. Turbidity associated with dredged material placement at Whaler Island may temporarily displace individuals from the area and/or increase susceptibility to predation. If tidewater goby are present within the vicinity of the Elk Creek estuary during project actions, any individuals present may avoid or be temporarily displaced from the vicinity. Effects to the tidewater goby from turbidity would be of limited duration.

Suspended sediments may settle out from the water column onto the Harbor bottom from turbid water associated with dredging of the navigational channels. Based on prior sediment sampling, contaminant levels that exceed CA State water quality standards are not anticipated to be present within the dredged material above existing background levels. Sediment sampling will be conducted prior to dredging and if contaminants are found, contaminants within the dredged sediment could become resuspended within the water column. Tidewater goby are limited to shallow brackish waters and would not occur in the marine portion of the Action Area.

5.4.6 Western Lily

The largest documented population of the Western lily occurs within the low elevation wetland complex adjacent to Highway 101 in the Crescent City Marsh Wildlife Area (over 1,000+ individuals have been documented). The placement of 93,000 cubic yards of sandy dredged material at Whaler Island could potentially result in beach aggradation (increased height or structure of the beach) at South Beach. Beach aggradation could potentially disrupt or impede outflow of at least two main culverts under Highway 101 that drain the Crescent City Marsh Wildlife Area. A USFWS 5-Year Review Summary and Evaluation report (USFWS 2009b) determined that decreased drainage from these culverts was inhibiting the growth of the lily within Crescent City Marsh. Inspection of the culverts on February 11, 2015 noted that debris had accumulated upstream of the culverts and was inhibiting flow through the culverts (HydroPlan and Anchor QEA 2015). It did not appear that beach sand was inhibiting flow through the culverts at the downstream end of the culverts at the time of survey. Caltrans is the responsible agency for maintaining culverts on state-owned and operated roadways.

The potential for beach aggradation from placement of dredged material at Whaler Island is dependent on several factors, including transport of sediment by tides, wave height, the structure or pitch of the nearshore shoreline, and storm events. Effects to plants would also depend on the time of year beach aggradation occurs, if in fact aggradation results from

placement of material at Whaler Island. If the culverts become blocked in winter when the plants are dormant, the duration of oversaturation may be better tolerated by dormant plants than if the plants become inundated during the warmer growing season.

The South Beach Aggradation Monitoring Plan (***Appendix A***) was prepared as a consequence of consultations with U.S. Fish and Wildlife (USFWS), California Coastal Commission (CCC), and California Division of Fish and Wildlife (CDFW) in February and March of 2019, regarding concerns over USACE placement of dredged material at Whaler Island. This plan outlines a monitoring approach, along five established transects, to determine whether placement of dredged material is impeding culvert flows either immediately during placement of dredged material or over a seasonal period. During the construction period, the contractor will be required to perform regular inspections of the culvert outlets and channels to determine if the accretion of sand is impeding flow.

The California Regional Water Quality Control Board (CRWQB) Monitoring and Reporting Program No. R1-2000-59 (Revised December 30, 2004) for Crescent City Harbor District maintenance dredging (USEPA 2017) requires the USACE to perform a survey of the beach elevations during minus tides (tides less than relative sea level). It is expected that alteration of the beach structure or height may not necessarily occur immediately after construction, but may occur after multiple tidal cycles and/or after storm events. It would be expected that the most measurable changes in beach elevation, if they should occur, would be greater at the northern end of South Beach closest to the Whaler Island placement area, where one of the culverts is located. A beach survey will be conducted prior to placement of dredged material at Whaler Island and during the following summer. Each survey will consist of cross sections of the beach at each culvert. Each cross section shall start at Highway 101 at the culvert outlet and extend along the centerline of the channel across the beach to open water. The first culvert is approximately 120 feet (37 meters) from the centerline of Anchor Way. The second and third culverts are located about 1,800 feet (549 meters) and 4,440 feet (1,353 meters), respectively, along Highway 101 from the first culvert.

Results of both of the beach surveys (prior to placement and post placement) will be provided to the Arcata Office of the USFWS. If comparison of the surveys indicates a significant accretion of sand has occurred at the culverts since the last dredging episode, USACE will coordinate with USFWS to determine additional mitigating measures and re-initiate consultation if appropriate.

6 Conclusions

6.1 Southern Oregon/Northern California Coastal coho Salmon

The project **may affect but is not likely to adversely** affect the SONCC coho salmon based on:

- The project may cause individuals within the dredged or placement areas to avoid the vicinity or be temporarily displaced from the vicinity of the action due to underwater vessel noise and turbidity;
- Dredging of the federal navigation channels may result in a temporary shallow layer of sedimentation on eelgrass beds within Crescent City Harbor where SONCC coho smolts may be rearing.

6.2 North American Green Sturgeon

The project **may affect but is not likely to adversely** affect the North American green sturgeon based on:

- The project may cause individuals within the dredged or placement areas to avoid the vicinity or be temporarily displaced from the vicinity of the action due to underwater vessel noise and turbidity;
- The placement of dredged material at HOODS may interfere with foraging habitat in the area of sediment mounding if the deposited sediment is deep enough to temporarily or permanently cover forage habitat.

6.3 Stellar Sea Lion

The project **may affect but is not likely to adversely affect** the Steller sea lion based on:

- Project activities within the harbor, transport route, and disposal sites may cause the Steller sea lion to avoid the area or become temporarily displaced from the vicinity.

6.4 Marbled Murrelet

The project **may affect but is not likely to adversely affect** the marbled murrelet based on:

- The presence of vessels within the transport route and or at HOODS may cause marbled murrelet individuals to avoid the vicinity of the vessel during foraging;
- Individuals or pairs foraging at sea may become temporarily displaced or flushed from feeding grounds;
- Communication between foraging pairs may become masked due to in-air and/or underwater vessel noise, resulting in disrupted foraging and communication between pairs.

6.5 Tidewater Goby

The project **may affect but is not likely to adversely affect** the tidewater goby based on:

- Turbidity from dredging activities may result in any tidewater goby present within the vicinity of the Elk Creek estuary to avoid the area or become temporarily displaced from the area.

6.6 Western Lily

The project **may affect but is not likely to adversely affect** the Western lily based on:

- Placement of 90,000 CY of sandy dredged material at Whaler Island may cause beach aggradation along South Beach that could potentially result in disruption or

impediment of the flow of one or more of the three culverts that drain the Crescent City Marsh Wildlife Area under Highway 101. While not anticipated, severe or prolonged impairment of drainage could result in over saturation in the area where a Western lily population is located. Depending on duration and timing (growing season vs dormancy) of any blockage resulting from beach aggradation, while unlikely to occur in amounts great enough to raise the beach elevation significantly, could in turn effectively drown plants if the culverts become blocked or the flow is impeded over a sufficient period of time.

- Beach elevation changes will be monitored during dredging and during the summer following placement in order to determine if beach levels have aggraded.
- Mitigating measures, such as excavating erosional pilot channels through beach sand, will be implemented if beach aggradation is found to be impeding flows from the outfall culverts. Therefore, the project is not likely to result in long-term hydrologic changes within the wetlands areas inhabited by the Western lily.

7 Essential Fish Habitat

The Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act) includes a mandate that the National Marine Fisheries Service (NMFS) must identify Essential Fish Habitat (EFH) for federally managed marine fish. The Magnuson-Stevens Act also requires federal agencies to consult with NMFS on all activities (or proposed activities) that they authorize, fund, or undertake if the activities may adversely affect EFH. Adverse effects include the direct or indirect physical, chemical, or biological alterations of the waters or substrate and loss of, or injury to, benthic organisms, prey species and their habitat, and other ecosystem components, if such modifications reduce the quality or quantity of EFH. The Pacific Fisheries Management Council (PFMC) has designated EFH for Coastal Pelagic Species, Highly Migratory Species, Pacific Salmon, and Pacific Coast Groundfish (PFMC 1998, 1999, 2003, 2005). All of these fisheries have designated EFH that can be found in the Action Area of Crescent City Harbor, the transport route, and at HOODS. Accordingly, this analysis will address EFH for the four groups of EFH documented to occur within the Action Area: West Coast salmon, Pacific Coast groundfish, Pacific coastal pelagic species and Pacific highly migratory species.

The Pacific Salmon Fishery includes in its designation all streams, lakes, ponds, wetlands, and other water bodies currently or historically accessible to salmon in Washington, Oregon, Idaho, and California except above the impassable barriers identified by PFMC. The Pacific Salmon fishery includes Chinook, Coho, and pink salmon in its designation. All three are potentially present in the Action Area (PFMC 1999).

The Pacific Coast Groundfish Fishery includes 80-plus species over a large and ecologically diverse area. The overall extent of groundfish EFH for all managed species is identified as all waters and substrate within the following areas:

- Depths less than or equal to 3,500 m (1,914 fathoms) to mean higher high water level

(MHHW) or the upriver extent of saltwater intrusion, defined as upstream and landward to where ocean derived salts measure less than 0.5 ppt during the period of average annual low flow.
- Seamounts in depths greater than 3,500 m as mapped in the EFH assessment.
- Areas designated as Habitat Areas of Particular Concern (HAPCs) not already identified by the above criteria.

Crescent City Harbor, within the project area, is defined as both an Estuarine and Seagrass HAPC and may provide probable suitable habitat for one or more life stages of 15 groundfish species (PFMC 2008).

In determining EFH for the Coastal Pelagic Species (CPS) Fishery, the estuarine and marine habitat necessary to provide sufficient CPS production to support a maximum sustained yield (MSY) CPS fishery and a healthy ecosystem was considered. The east-west geographic boundary of EFH for each individual CPS finfish and market squid is defined to be all marine and estuarine waters from the shoreline along the coasts of California, Oregon, and Washington offshore to the limits of the exclusive economic zone (EEZ) and above the thermocline where sea surface temperatures range between 10°C to 26°C. The southern boundary of the geographic range of all CPS finfish is consistently south of the US-Mexico border, indicating a consistency in sea surface temperatures at below 26°C, the upper thermal tolerance of CPS finfish. Therefore, the southern extent of EFH for CPS finfish is the United States-Mexico maritime boundary. The northern EFH boundary is the position of the 10°C isotherm which varies both seasonally and annually. The CPS documented to occur within the Action Area are shown below in ***Table 4***.

Highly Migratory Species (HMS) include tunas, billfish, dorado, and sharks—species that range great distances during their lifetime, extending beyond national boundaries into international waters and among the EEZs of many nations in the Pacific. The HMS Fisheries Management Plan (NMFS 2005) describes species proposed for active management in detail. There are five tuna species, five shark species, striped marlin, swordfish, and dorado or dolphinfish. A much longer list of species, constituting all those that have been caught in HMS fisheries and not already under state or federal management, are not part of the management unit. The HMS documented to occur within the Action Area are shown below in ***Table 4***.

Table 3. Species with designated EFH found in the Marine and Estuarine waters of the Action Area

Groundfish Species	Coastal Pelagic Species	Highly Migratory Species	Pacific Salmon
Rex Sole	Jack Mackerel	Bigeye Thresher Shark North Pacific	Chinook Salmon
Yelloweye Rockfish	Pacific (Chub) Mackerel	Bluefin Tuna Pacific	Pink Salmon

Shortraker and Rougheye Rockfish	Pacific Sardine	Dolphinfish (Dorado or Mahi-mahi) Pacific	coho Salmon
Dusky Rockfish	Northern Anchovy Central Subpopulation	Pelagic Thresher Shark North Pacific	
Northern Rockfish	Northern Anchovy Northern Subpopulation	Swordfish North Pacific	
Thornyhead Rockfish	Market Squid		
Pacific Ocean Perch	Krill Thysanoessa Spinifera		
Walleye Pollock	Krill Euphausia Pacifica		
Pacific Cod	Other Krill Species		
Habitat Areas of Particular Concern (HAPC)			
Estuarine HAPC			
Seagrass HAPC			

7.1 Description of Proposed Action

A detailed description of the proposed Crescent City Harbor Federal Navigation Channel Maintenance Project is presented in the body of this BA in ***Section 2***, ***Description of the Action and Action Area***.

7.2 Effects of the Proposed Action

The proposed project has the potential to affect EFH for the fisheries identified in ***Table 4***. A detailed description of potential direct and indirect effects can be found in ***Section 5, Effects of the Action***. The following effects are summarized below and presented as they potentially impact EFH species:

7.2.1 Underwater Noise

Noise generated underwater from the dredge vessel and dredging activities is expected to occur during the entirety of the projected project (approximately 12 weeks). Dredging activities and vessel noise would be expected to be generated above ambient underwater noise levels within the harbor. Similar to the effects to SONCC coho and the North American green sturgeon, the project may cause all EFH species within the dredged or placement area to avoid the vicinity or be temporarily displaced from the vicinity of the action due to increased underwater vessel noise.

7.2.2 Turbidity

Sediment is expected to become suspended within the water column during dredging of the navigation channel and placement at the dredged material placement sites, and may result in turbid water surrounding the dredge equipment. Within Crescent City Harbor, the size, intensity, and duration of the turbidity plume will depend on particle size of the dredged material (larger sand particles will settle faster than smaller silt particles), tides, and ambient turbidity levels at the time of the dredge event. Similar to the dredge site, the size, intensity, and duration of the turbidity plume at the placement sites will depend on the sediment size, tides, ambient turbidity levels at the time of the dredge event, and the quantity of material to be placed at each proposed dredged material placement site. Similar to the effects to SONCC coho and the North American Green Sturgeon, the project may cause all EFH species within the dredged or placement area to avoid the vicinity of the dredged area and/or placement area or be temporarily displaced from the vicinity of the turbidity plume.

7.2.3 Sedimentation

Some sedimentation is likely to occur on the harbor bottom during dredging within close proximity to the navigation channels. No eelgrass is expected to occur within the navigation channels themselves as the channels have been dredged periodically for decades. Sedimentation of the seafloor at HOODS is likely to occur immediately after release of the material. The deposition of sediment is likely to remain primarily within the boundary of the site limits due to EPA requirements to release material within specific quadrants of the placement site boundary. Areas of eelgrass are present within the shallow water areas of the Harbor. These areas could become temporarily covered in a thin layer of sediment for an unknown period of time until tides or currents flush the area. The thin layer of sediment could temporarily disrupt Groundfish EFH species. The placement of dredged material at HOODS may interfere with foraging habitat for Groundfish EFH species in the area of sediment mounding if the placed sediment is deep enough to temporarily or permanently cover forage habitat.

7.2.4 Water Quality and Contaminated Sediments

All MET dissolved metals were reported at concentrations below the water quality objectives of the California Toxics Rule and the USEPA's Section 304(a) criteria for Priority Toxic Pollutants. MET elutriate bioassay results showed that none of the three channel samples exhibited toxicity to the mysid Americamysis bahia or were significantly different from the offshore reference site. Past water quality monitoring conducted by the USACE has not identified any exceedances of RWQCB water quality objectives. It is anticipated that the proposed action would not release contaminants through dredging actions or otherwise increase contaminants into the water column during dredging or disposal activities.

Contaminant levels that exceed CA State water quality standards are not expected within the dredged material above existing background levels. However, if contaminants are present within the dredged sediment, they could become resuspended within the water column.

7.3 Proposed Conservation Measures

A detailed description of the proposed Crescent City Harbor Federal Navigation Channel Maintenance Project BMPs, including avoidance and minimizations measures, is presented in the body of this BA in Description of Proposed Conservation Measures.

7.4 Conclusions by EFH

The proposed project **may adversely affect** EFH for the Pacific Salmon, Pacific Coast Groundfish, Coastal Pelagic Species, and Highly Migratory Species Fisheries. The direct adverse effects of the proposed project to EFH include: underwater noise disturbance; temporary degradation of water quality from turbidity caused by dredging of the navigation channels and placement of material at the proposed depositional sites; and temporary degradation of benthic habitat due to low sedimentation potential in the harbor and moderate to high sedimentation potential at the proposed dredge disposal sites. The majority of effects are temporary in nature, though sedimentation of benthic habitat at HOODS may result in longer term degradation of benthic habitat within the disposal area. The majority of potential effects to EFH are considered negligible. Sedimentation of benthic habitat within the seabed at HOODS may result in a loss of habitat in these areas, however, HOODS is designated as an open ocean disposal site and as such is periodically utilized for dredged material disposal. Benthic habitat within these areas would likely be periodically subject to deep layers of sedimentation which has probably changed the biological diversity and character of the sites. The overall cumulative effects to EFH is considered negligible.

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U.S. Fish and Wildlife Service Letter dated

November 2, 2009 (from Randy Brown to Larry Simon)

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Arcata Fish and Wildlife Office
1655 Heindon Road
Arcata, California, 95521
Phone: (707) 822-7201 FAX: (707) 822-8411

In Reply Refer To:
AFWO8-14-2009-3668
TAILS 81331-2010-TA-0004

NOV 0 2 2009

Mr. Larry Simon
Coastal Consistency Division
California Coastal Commission
45 Fremont Street, Suite 2000
San Francisco, California 94105-2219

Subject: Maintenance Dredging of Crescent City Harbor Marina Access Channel, Consistency Determination No. CD-060-09, Corps of Engineers, Del Norte County, California

The Arcata Fish and Wildlife Office (AFWO) would like to comment regarding maintenance dredging of the Crescent City Harbor Marina Access Channel proposed by the Army Corps of Engineers (ACOE). Beginning in January of 2009 the AFWO initiated communications with the San Francisco District of the ACOE regarding the dredging at Crescent City Harbor. We have expressed our concern to the ACOE that past placement of dredge spoils near South Beach, Crescent City, may have contributed to aggradation of the beach in the vicinity of the two culverts that pass under Highway 101. These culverts serve as the primary discharge outlet for Crescent City Marsh. It is our understanding that the California Department of Transportation has encountered problems maintaining free-flow through both culverts, due to the very low flow gradient onto the beach. We also understand that one of the culverts, located at the northern end of South Beach, is currently completely blocked by beach sediments and debris.

Crescent City Marsh supports greater than 70 percent of the entire reproductive population of the federally listed endangered western lily (*Lilium occidentale*). Maintenance of this population of the lily is critical to recovery of the species. Beginning in the late 1990's, our data

indicates the western lily population in the Crescent City Marsh declined by as much as 50 percent, and the lily was completely eliminated from portions of the marsh nearest to the culverts. Those declines appeared to coincide with unusually high water levels in the marsh that extended well into the summer.

We are requesting that prior to discharge of any further dredge material at the Whaler Island or South Beach disposal sites, an assessment be conducted of the potential direct, indirect, and cumulative effects of dredge spoil discharge on the aggradation of South Beach as far south as Enderts Beach Road. This assessment should also include the operation of the two Highway 101 culverts that drain onto this section of beach.

If the discharges are affecting South Beach, consultation under Section 7 of the Endangered Species Act, as amended (16 U.S.C. Section 1531 et seq.), for this project may be warranted. We believe the period during which discharge sediments could migrate onto the beach could extend well beyond the actual dredging period. Therefore, any beach monitoring designed to elucidate the effects of dredge disposal on beach aggradation should occur both during, and after, the dredging period.

If you have any questions regarding our interest in this project, please contact staff ecologist David Imper at (707) 882-7201.

Sincerely,

Randy A. Brown
Acting Field Supervisor

cc:
ACOE, San Francisco, CA (Attn: Mr. Laurie H. Suda, Chief Environmental Section B)
CDFG, Eureka (Attn: Mr. Michael Van Hattem/ Ms. Vicki Frey)
CCC, Eureka (Attn: Mr. Jim Baskin)

U.S. Fish and Wildlife Service Letter dated

December 21, 2010 (from Nancy Finley to Peter LaCivita)

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Arcata Fish and Wildlife Office
1655 Heindon Road
Arcata, California 95521
Phone: (707) 822-7201 FAX: (707) 822-8411

In Reply Refer To:
AFWO-11B0017-11TA0028

DEC 2 1 2010

Mr. Peter LaCivita, CESPN-ET-PB
Department of the Army
Corps of Engineers, San Francisco District
1455 Market Street, 15th Floor
San Francisco, California 94103

Subject: Maintenance Dredging of Crescent City Harbor, Del Norte County, California; Environmental Assessment dated November 12, 2010

Dear Mr. LaCivita:

We are submitting these comments in response to the environmental assessment (EA) for the FY2010-2011 maintenance dredging of Federal channels at Crescent City Harbor, dated November 12, 2010. Although it was unclear, the project description appeared to leave open the possibility for discharge of dredge tailings at the Whaler Island disposal site. We have commented in the past concerning the potential indirect impacts of disposal at Whaler Island on the federally endangered western lily (*Lilium occidentale*), of which the largest population range-wide occurs within Crescent City Marsh (marsh). There is growing evidence that sediments discharged at Whaler Island may be related to a rise in the beach profile on Crescent Beach, immediately adjacent to the discharge site, which has interfered with the ability to drain the marsh through two culverts located under U.S. Highway 101. We most recently submitted comments to your office, by letter in January 2010 (attached), in response to your assessment of the culvert drainage problems conducted on November 12, 2009.

The EA for this phase of dredging is incomplete with respect to the potential for significant impacts on the western lily. The action area should be defined to include the marsh, since there is evidence that both direct beach nourishment, and indirect beach nourishment as a result of any discharge of spoils at the groin at Whaler Island, both of which were discussed in the November 2010 EA, may impede the ability to drain the marsh.

TAKE PRIDE IN AMERICA

The assessment of impacts on the western lily should take into account the evidence showing a close relationship between the depth of water in the marsh, the efficiency of drainage at Highway 101, and mortality of the western lily.

For future consideration, we would be interested to accompany Army Corps of Engineers (Corps) staff in conducting a site review of the area in question, or discuss at length our issues concerning the drainage problem. We fully support any future investigation of disposal impacts, as requested by the Coastal Commission in their letter dated November 6, 2009, and are ready to assist in any way. As a reminder, under the Endangered Species Act, and its implementing regulations, the Corps should consult on the potential for impacts on the western lily resulting from any future placement of dredge disposal waste at Whaler Island.

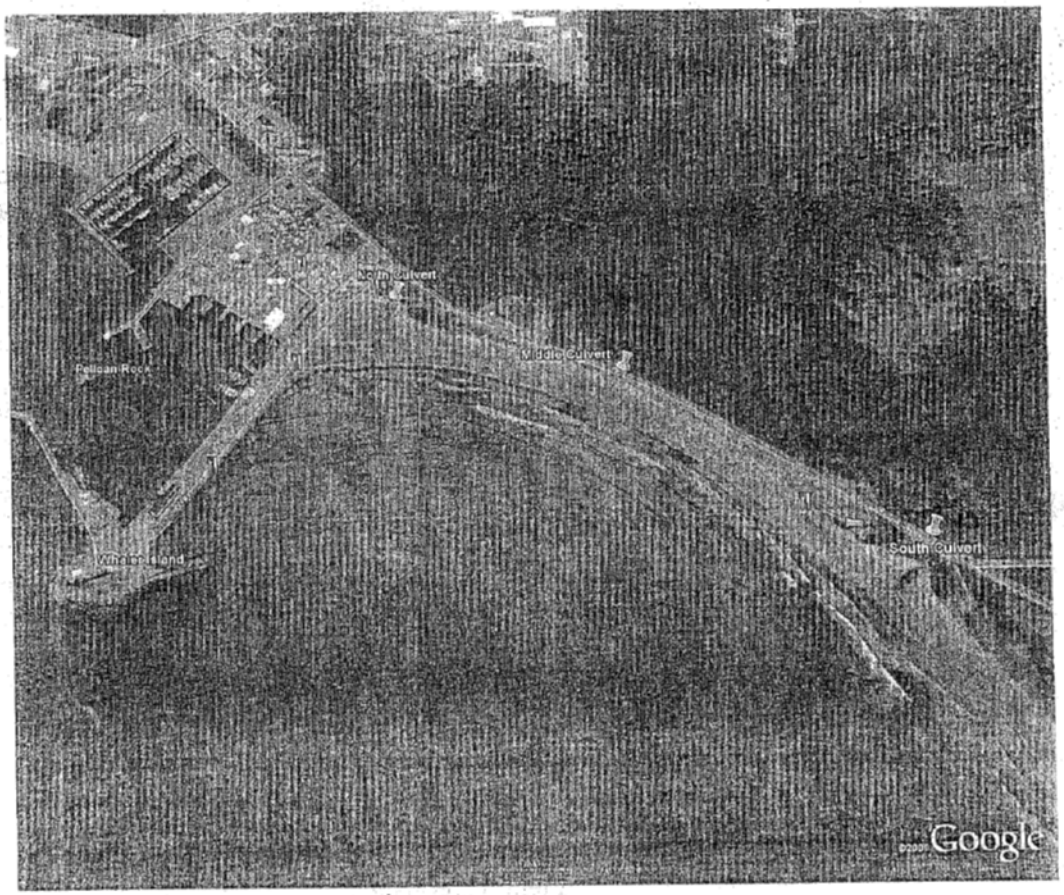
If you have any questions regarding our comments, please contact staff ecologist David Imper at (707) 822-7201.

Sincerely,

Nancy J. Finley
Field Supervisor

Attachment

cc:
California Department of Fish and Game, Eureka, California (Attn: Michael Van Hattem and Vicki Frey).
California Coastal Commission, Eureka (Attn: Jim Baskin).
California Coastal Commission, San Francisco (Attn: Larry Simon).
California Department of Transportation, Eureka (Attn: Sebastian Cohen).



It does not appear that sand is clogging the outlets. If the Whaler Island Site serves in part as an erosion control project, then the littoral zone is most likely dispersive and the sand does not stay there. Also, there are no sand dunes. Sand that is surplus to what the littoral drift would move north or south would accrete to the beach and form dunes. Engineering considerations aside, driftwood transported by storm surge appears to be the primary cause of culvert blockage. A final consideration is that there has been no disposal at Whaler Island since 1999. Dredged material from the harbor deepening in 2001 was placed at the Harbor District's upland site. Therefore, it is highly likely the navigation projects are not the problem.

I recommend coordination with the Harbor District, Coastal Commission, and the State to be assured that the disposal of Federal channel dredged material is consistent with Whaler Island Groin Project purposes.

Peter E. LaCivita
Regional Fishery Biologist
USAED San Francisco

U.S. Fish and Wildlife Service Letter dated

December 21, 2010 (from Randy Brown to Laurie Suda)

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Arcata Fish and Wildlife Office
1655 Heindon Road
Arcata, California, 95521
Phone: (707) 822-7201 FAX: (707) 822-8411

In Reply Refer To:
AFWO8-14-2009-3668
TAILS 81331-2010-TA-0004

DEC 21 2010

Mr. Laurie Suda, Chief Environmental Section B
Army Corps of Engineers, San Francisco District
1455 Market Street
San Francisco, California 94103-1398

Subject: Maintenance Dredging of Crescent City Harbor Marina Access Channel, Del Norte County, California

Dear Mr. Suda:

Thank you for your email transmittal of the review conducted by Peter LaCivita, concerning potential impacts of dredge disposal on Highway 101 drainage south of Crescent City, dated November 12, 2009. For future consideration, we would be interested to accompany Army Corps of Engineers staff in conducting a site review of the area in question, or discuss at length our issues concerning the drainage problem. I'd also like to clarify several points made in Mr. LaCivita's report. To help illustrate the drainage situation there, I have attached several Powerpoint slides presented by my staff ecologist, Dave Imper, at a recent Caltrans Technical Forum in Eureka. I also attached a copy of Mr. LaCivita's report.

We are not concerned with the northernmost culvert, located at 101MP25.26 (slide 1). That culvert has never been observed to be blocked, and drains an area of the Crescent City Marsh (Marsh) that appears to be hydraulically isolated from the southern portion of the Marsh where the flooding and federally endangered western lily (*Lilium occidentale*) occur. The flowline of this drain, both at the box culvert and at a concrete sill just above the beach, are several feet lower than the flowlines at the southern two culverts. The upper beach elevation also appears to be several feet lower here than at the southern two culverts.

TAKE PRIDE IN AMERICA

Regarding Mr. LaCivita's statement that the outlet of the culvert at 101MP24.92 ("middle culvert") is clear, Caltrans has advised us that they removed as much of the woody debris and sand from the outlet as they could last spring. Based on an inspection by Mr. Imper during the week of November 24, 2009, the primary effect of that clearing seems to have been to allow storm surges this winter to wash debris back under the highway into the inlet ditch. The elevation of the upper beach immediately surrounding the culvert outlet, as indicated in Mr. LaCivita's picture, remains close to the top of the culvert. The culvert provides no effective drainage of the Marsh, and we expect the outlet will completely block again soon. Slide 2 shows a series of oblique photos in the vicinity of the "middle" culvert, taken in 1972, 2002 and 2006. The historical photographs indicate the upper beach has accreted dramatically in the past several years. In addition, Mr. Imper personally recalls that in 1987, a rather tall bluff separated the road from the upper beach in that area.

The southern culvert at 101MP24.42 (slides 3 and 4) is the only culvert draining the majority of the approximately 1,500 acre watershed, and is only partially functioning. Based on the elevation profile measured two years ago, the flowline of the channel near the beach was nearly 3 feet above the lower culvert elevation at the outlet. The upper beach appears significantly accreted in the vicinity of the outlet channel.

As stated by Mr. LaCivita, disposal of dredge tailings at Whaler Island last occurred in 1999, at about the same time that flooding of the marsh in mid-summer became obvious. We do not know if there were dune accumulations at that time that might have signaled a surplus of material moving up onto the beach. However, there is the clear potential that the dredge disposal materials have influenced the beach profile, and therefore, the ability of the Marsh to drain.

Thank you for your interest in this project. We fully support any future investigation of disposal impacts, as requested by the Coastal Commission in their letter dated November 6, 2009, and are ready to assist in any way. Please be aware, under the Endangered Species Act, and its implementing regulations, the Corps should consult on the potential for impacts on the western lily resulting from any future placement of dredge disposal waste at Whaler Island.

If you have any questions regarding our interest in this project, please contact staff ecologist David Imper at (707) 822-7201.

Sincerely,

Randy Brown
Acting Field Supervisor

cc:
California Department of Fish and Game, Eureka, California (Attn: Michael Van Hattem and Vicki Frey).
California Coastal Commission, Eureka, California (Attn: Jim Baskin).
California Coastal Commission, San Francisco, California (Attn: Larry Simon).

Appendix B

Terrestrial Noise Analysis Calculations

Equation Used to Calculate Noise Level at Different Distance

$N_2 = N_1 + 20\log(D_1/D_2)$, where:

D_1 = original distance

N_1 = noise level at original distance

D_2 = new distance

N_2 = noise level at new distance

Table 1. Calculated Noise Level at New Distance

Source	Receptor at D2	D_1	N_1	D_2	N_2
Cutterhead Dredge noise	Harbor Office	50	90	200	78
	Chart Room Restaurant	50	90	1000	64
	U.S. Coast Guard Station	50	90	350	73
	Bayside RV Park	50	90	640	68

Equation Used to Calculate Combined Noise Level of Construction Equipment and Existing Ambient Noise at Sensitive Receptors

Ns = 10 log10 (10^[Na/10]+ 10^[N3/10], where:

N3 = noise level of existing ambient noise at the receptor

Na = attenuated noise level of construction equipment at sensitive receptor

Site	Noise Source/Receptor Analyzed	N_3 (average ambient noise estimate)	N_a (attenuated noise at sensitive receptor)	Combined Noise N_s	Difference btw ambient and new combined
	Harbor Office	78	78	81	3.0
	Chart Room Restaurant	64	64	67	3.0
	U.S. Coast Guard Station	74	74	77	3.0
	Bayside RV Parl	68	68	71	3.0

Noise Analysis Calculations

Equation Used to Calculate Combined Noise Level of Construction Equipment

$N_e = 10 \log_{10} (10^{[N_1/10]} + 10^{[N_2/10]})$, where:

N_e = combined noise level of construction equipment at 50 feet = 102 dBA

N_1 = noise level of vibratory pile driver at 50 feet = 96 dBA

N_2 = noise level of impact pile driver at 50 feet = 101 dBA

Equation Used to Calculate Attenuated Noise Level of Construction Equipment

$N_a = N_e - 6(Di/Do)$, where:

N_a = attenuated noise level of construction equipment

Di = distance of noise source to receptor

Do = reference distance = 50 feet

Equation Used to Calculate Combined Noise Level of Construction Equipment and

$N_s = 10 \log_{10} (10^{[Na/10]} + 10^{[N_3/10]}$, where:

N_3 = noise level of existing ambient noise at the receptor

Appendix C

California Regional Water Quality Control Board North Coast Region

Monitoring and Reporting Program No. R1-2000-59

for

Crescent City Harbor District Maintenance Dredging

California Regional Water Quality Control Board
North Coast Region

Monitoring and Reporting Program No. R1-2000-59
(Revised December 30, 2004)

for

Crescent City Harbor District
Maintenance Dredging

Del Norte County

The purpose of this monitoring program is to demonstrate that the requirements of Order No. R1-2000-59 are being met. The program calls for routine monitoring at regular intervals during and following dredging operations.

Dredging Records

Dredging activity shall be reported daily as "none" if the dredge is inactive, or "pond" if the dredge is placing spoil in the pond, or "beach" if the dredge is placing spoil at the Whaler Island disposal site.

Effluent Monitoring

Effluent grab samples shall be collected daily when the dredge spoil pond overflows. Samples shall be analyzed for turbidity (as NTU) and settleable solids (as mL/L). "Dry" shall be reported in place of sample results for each day of dredging not producing dredge spoil pond overflow.

Annually, on the first day of dredge spoil pond overflow or dredge discharge to the Whaler Island disposal site during a calendar year, a chronic toxicity bioassay shall be conducted using a sample of the discharge. During the first year, test organisms shall include topsmelt *Atherinops affinis*, red abalone *Haliotis rufescens*, and giant kelp *Macrocystis pyrifera*. The sensitivity of these three test organisms shall be determined during the first year of testing, and subsequent chronic toxicity bioassays shall use only the critical life stage of the most sensitive of the three organisms.

Receiving Water Monitoring

Receiving water samples shall be collected daily, within one hour of high tide, when the dredge spoil pond overflows or the dredge is placing spoil at the Whaler Island disposal site. These samples shall be analyzed for turbidity. One sample shall be taken near the ice house at the end of Citizens Dock Road, and the other shall be taken within 200 feet of the point of entrance of the discharge into the Ocean.

Annual Survey

An annual biological survey of the Whaler Island disposal site shall be conducted during the summer following use of the site for dredge disposal. Observation sites shall be established – one on the seaward side the groin extending southeasterly from Whaler Island, and the other on the opposite side of the groin. For each observation site the marine biologist conducting the survey shall quantify and report the density of colonization for each marine species observed.

A physical survey by a licensed land surveyor shall be made of the beach elevations within the groin during minus tides at approximately the same time as the biological survey. A map of the survey results shall be submitted with the monitoring report for the month of the survey.

Monitoring and Records

Samples and measurements taken for the purpose of monitoring shall be representative of the monitored activity.

The discharger shall calibrate and perform maintenance procedures in accordance with manufacturer's specifications on all monitoring instruments and equipment to ensure accurate measurements.

Records of monitoring information shall include:

1. The date, exact place, and time of sampling or measurements;
2. the individuals who performed the sampling or measurements;
3. the date(s) analyses were performed;
4. the individual(s) who performed the analyses;
5. the analytical techniques or methods used;
6. the results of such analyses;
7. the method detection limit; and
8. the practical quantitation level (PQL) or the limit of quantitation (LOQ).

Unless otherwise noted, all sampling and sample preservation shall be in accordance with the current edition of "Standard Methods for the Examination of Water and Wastewater" (American Public Health Association.)

All permit applications, reports, or information submitted to the Regional Water Board shall be signed by either a principal executive officer or ranking elected official of Crescent City Harbor District.

Any person signing a document under this monitoring and reporting program shall make the following certification:

"I certify under penalty of perjury that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment."

Reporting

Monitoring reports shall be submitted to the Regional Water Board for each month on or before the last day of the following month. Reports shall be submitted on a form similar to the attached example.

Ordered by: _____

Catherine E. Kuhlman
Executive Officer

December 30, 2004

ALW:js/123004_DredgingM&R

DEPARTMENT OF THE ARMY
SAN FRANCISCO DISTRICT, U.S. ARMY CORPS OF ENGINEERS
450 GOLDEN GATE AVENUE
SAN FRANCISCO, CALIFORNIA 94102

April 30, 2019

Mr. Dan Everson
Field Supervisor, Arcata Fish and Wildlife Office
U.S. Fish and Wildlife Service
1655 Heindon Road
Arcata, California 95521

SUBJECT: Crescent City Harbor 2019 Maintenance Dredging: Section 7 Endangered Species Act Consultation

Dear Mr. Everson:

On Wednesday, April 24, 2019, an updated biological assessment (BA) was sent as an email attachment to Clint Pogue, a biologist in your office. This BA addresses the impacts of the Crescent City Harbor 2019 maintenance dredging, and was prepared in accordance with the requirements set forth under section 7 of the Endangered Species Act.

We propose to dredge the three federal navigation channels in Crescent City Harbor down to their authorized depths by using both hydraulic cutterhead and mechanical (clamshell) dredging methods. The sandy dredged sediment from the Entrance Channel and the Marina Access Channel will be transported via pipeline to a nearshore placement site off of Whaler Island. The relatively silty dredged sediment from the Inner Harbor Basin Channel will be transported via barge to the Humboldt Open Ocean Disposal Site (HOODS).

It has been conjectured that the placement of sandy dredged material off of Whaler Island could lead to beach aggradation on nearby South Beach and the clogging of drainage culverts to the Crescent City Marsh where the endangered Western lily is located. To monitor for potential impacts, a proposed monitoring plan is included in Appendix A to the BA. With the proposed monitoring, the USACE has concluded the project may affect, but is not likely to adversely affect the Western lily.

We respectfully request written concurrence with our assessment and determination. If you have any questions or concerns, please contact Dr. Mark Wiechmann at (415) 503-6846, or by email at: Mark.J.Wiechmann@usace.army.mil.

Sincerely,

Dr. Tessa E. Beach
Chief, Environmental Sections

Encl.

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
West Coast Region
1655 Heindon Road
Arcata, California 95521-4573

March 26, 2019 **Refer to NMFS No:** WCRO-2019-00097

Tessa E. Beach
Chief, Environmental Sections
U.S Army Corps of Engineers
San Francisco District
450 Golden Gate Avenue
San Francisco, California 94102

Re: Endangered Species Act Section 7(a)(2) Concurrence Letter and Magnuson-Stevens Fishery Conservation and Management Act Essential Fish Habitat Response for the 2019 Crescent City Harbor Federal Navigation Channel Maintenance Dredging Project in Crescent City, Del Norte County, California.

Dear Ms. Beach:

On February 25, 2019, NOAA's National Marine Fisheries Service (NMFS) received your final documents regarding your request for a written concurrence that the U.S Army Corps of Engineers (Corps) is not likely to adversely affect (NLAA) species listed as threatened or endangered or critical habitats designated under the Endangered Species Act (ESA). This response to your request was prepared by NMFS pursuant to section 7(a)(2) of the ESA, implementing regulations at 50 CFR 402, and agency guidance for preparation of letters of concurrence.

NMFS also reviewed the proposed action for potential effects on essential fish habitat (EFH) designated under the Magnuson-Stevens Fishery Conservation and Management Act (MSA), including conservation measures and any determination made regarding the potential effects of the action. This review was pursuant to section 305(b) of the MSA, implementing regulations at 50 CFR 600.920, and agency guidance for use of the ESA consultation process to complete EFH consultation.

This letter underwent pre-dissemination review using standards for utility, integrity, and objectivity in compliance with applicable guidelines issued under the Data Quality Act (section 515 of the Treasury and General Government Appropriations Act for Fiscal Year 2001, Public Law 106-554). The concurrence letter will be available through the NOAA Institutional Repository after approximately two weeks. A complete record of this consultation is on file at the Northern California Office in Arcata, CA.

Proposed Action and Action Area

The Corps proposes to perform maintenance dredging of the existing federal navigation channels within Crescent City Harbor (Harbor), Del Norte County, California (Project). The Project entails

dredging approximately 112,000 cubic yards of sediment from three channel components within the Harbor (outer channel, inner channel, and access channel) using a clamshell dredge and/or a hydraulic cutter dredge with pipeline. There are two dredging and disposal options that may be used:

a. Option A would involve excavation of approximately 42,000 cubic yards of sediment from the dredge ponds upland disposal site in the Harbor and hauling excavated material to an upland site to make room for new dredged sediment. A cutter head dredge would then excavate and pump up to 22,000 cubic yards of fine sediment from the Inner Harbor Basin into the upland site dredge ponds. The remaining 90,000 cubic yards of sandy material from the entrance channel and marina access channel would be placed at Whaler Island adjacent to the Harbor.
b. Option B would involve using a cutter head dredge and pipeline to dredge and pump up to 90,000 cubic yards of sediment from the entrance channel and marina access channel for disposal on Whaler Island. A clamshell dredge would be used to excavate up to 22,000 cubic yards of material from the inner boat basin for disposal at the Humboldt Open Ocean Disposal Site (HOODS).

Maintenance dredging and disposal activities are proposed to take place between July 1 and October 15th 2019, with an extension to November 15th if no rain has occurred that would spur upstream movement by coho salmon. Dredging operations are expected to take up to 12 weeks.

The action area for the Project includes the Harbor, the Whaler Island and dredge pond disposal sites at the Harbor, South Beach in Crescent City from the Harbor south to Cushing Creek, the 66-mile barge route to HOODS and the HOODS disposal site in the open ocean 66 miles south of the Harbor. Noise and turbidity from dredging and sediment transport are expected to extend up to 1 nautical mile beyond the Harbor, barge route, and disposal sites.

Action Agency's Effects Determination
Available information indicates the following listed species (Evolutionarily Significant Units [ESU]) under the jurisdiction of NMFS may be affected by the proposed project:

Southern Oregon/Northern California Coast (SONCC) coho salmon (*Oncorhyncus kisutch*)
Threatened (70 FR 37160; June 28, 2005)
Critical habitat (64 FR 24049; May 5, 1999)

The Corps determined the Project may affect, but is not likely to adversely affect SONCC coho salmon and their designated critical habitat. The Corps' rationale for their determination includes the timing of the Project (July 1 to November 15) when coho salmon are not expected to be present; areas proposed for dredging and disposal have been previously used and considered to be disturbed; temporary nature of the Project; availability of suitable habitat elsewhere; and rapid recolonization of infaunal species. The Corps has also determined that the Project may adversely affect EFH.

SONCC Coho Salmon Life History: Coho salmon have a generally simple 3-year life history. The adults typically migrate from the ocean and into the Harbor towards their freshwater spawning grounds in Elk Creek in the fall, and spawn by mid-winter. Adults die after spawning. The eggs are buried in nests, called redds, in the rivers and streams where the adults spawn. The eggs incubate in the gravel until fish hatch and emerge from the gravel the following spring as fry. These 0+ age fish

typically rear in freshwater for about 15 months before migrating to the ocean primarily during the months March through May. The juveniles go through a physiological change during the transition from fresh to salt water called smoltification. Coho salmon typically rear in the ocean for two growing seasons, returning to their natal streams as 3-year old fish to renew the cycle.
Juvenile coho salmon use of the Harbor is not known, although they are present in Elk Creek which flows into the Harbor. The Harbor is artificially constructed and includes significant alterations and infrastructure constructed to accommodate a robust port which limits suitable habitat for coho salmon. We expect that the Harbor provides limited rearing habitat for rearing juveniles and holding adult coho salmon and mostly provides migratory habitat. We expect that residence times for juvenile coho salmon outmigrating through the Harbor is likely less than the 10 to 12 days juvenile coho salmon typically spend in the much larger and richer habitat in Humboldt Bay to the south (Pinnix 2013). Therefore, we expect exposure of coho salmon to the dredging operations to be unlikely because of the July 1 through November 15 Project implementation period which suggests most, if not all, coho salmon migrating out of Elk Creek will have left the Harbor.

Consultation History
NMFS bases its consultation on the information provided by the Corps including the February 25, 2019, updated biological assessment and response to NMFS' November 20, 2018, request for additional information. The Corps requested NMFS' concurrence that the Project, as proposed, is not likely to adversely affect SONCC coho salmon or their designated critical habitat. The Corps also determined that the Project might adversely affect species and their habitats identified under the Pacific Coast Salmon Fishery Management Plan (FMP), Pacific Coast Groundfish FMP, and Coastal Pelagic FMP. On February 25, 2019, NMFS initiated informal consultation as described above.

ENDANGERED SPECIES ACT

Effects of the Action
Under the ESA, "effects of the action" means the direct and indirect effects of an action on the listed species or critical habitat, together with the effects of other activities that are interrelated or interdependent with that action (50 CFR 402.02). The applicable standard to find that a proposed action is not likely to adversely affect listed species or critical habitat is that all of the effects of the action are expected to be discountable, insignificant, or completely beneficial. Beneficial effects are contemporaneous positive effects without any adverse effects to the species or critical habitat. Insignificant effects relate to the size of the impact and should never reach the scale where take occurs. Discountable effects are those extremely unlikely to occur.

Effects on Coho Salmon Critical Habitat
The critical habitat designations for SONCC coho salmon use the term primary constituent element or essential feature. The new critical habitat regulations (81 FR 7414) replace this term with physical or biological features (PBFs). This shift in terminology does not change the approach used in conducting our analysis, whether the original designation identified primary constituent elements, physical or biological features, or essential features. In this consultation, we use the term PBF to mean primary constituent element or essential feature, as appropriate for the specific critical habitat.

Within the range of the SONCC coho salmon, the life cycle of the species can be separated into five PBFs or essential habitat types: (1) juvenile summer and winter rearing areas, (2) juvenile migration corridors, (3) areas for growth and development to adulthood, (4) adult migration corridors, and (5)

spawning areas. Areas 1 and 5 are often located in small headwater streams and side channels, while areas 2 and 4 include these tributaries as well as mainstem reaches and estuarine zones. Growth and development to adulthood (area 3) occurs primarily in near- and off-shore marine waters, although final maturation takes place in freshwater tributaries when the adults return to spawn. Within these areas, essential features of coho salmon critical habitat include adequate: (1) substrate, (2) water quality, (3) water quantity, (4) water temperature, (5) water velocity, (6) cover/shelter, (7) food, (8) riparian vegetation, (9) space, and (10) safe passage conditions (NMFS 1999). The PBFs of coho salmon critical habitat associated with this project relate to: areas for growth and development to adulthood. The essential features that may be affected by the proposed action include water quality and prey resources (food).

Water Quality PBF

The proposed action includes activities that could degrade the water quality PBF for coho salmon. Degraded water quality is expected to result from increased turbidity from disturbance of sediment and the incidental fallback of sediment from the dredge operations and dredge spoil discharge. Implementation of the minimization measures, which are included in the proposed action, will ensure any effects of turbidity are minimized. The dredging methods will minimize the extent and duration of turbid conditions, which are expected to extend no more than 200-feet from work areas. Because work will only occur in one discrete location at any time, the majority of the action area will remain undisturbed during project activities. NMFS expects that the temporary reduction in water quality in the Harbor will not affect the conservation value of critical habitat as water quality will recover to pre-dredge conditions very soon after dredging ceases and much sooner than when coho salmon would be present. Therefore the effects of dredging on water quality is insignficant.

Prey/Forage Resources (Food) PBF

The proposed action will result in the temporary loss of some benthic food resources within the area of the dredge footprint of the Project. Additionally, some benthic food resources may be smothered at dredge disposal sites. Given the proposed work window, the majority of the disturbance to prey resources in the action area will occur during times when coho salmon use of the action area is very low. As coho salmon use of the action area increases in the spring months the following year, the dredge and spoil disposal areas would have had several months to recover and be recolonized by benthic organisms. The preferred prey resources for juvenile coho salmon (Dungeness crab larvae, Pacific herring larvae, harpacticoid copepods, etc) would not be affected by the Project. Because prey resources are not expected to be significantly affected, NMFS does not expect any adverse effects to the Prey Resource PBF.

<u>Effects to Coho Salmon Individuals</u>

The Project has the potential to affect all life stages of the listed coho salmon occurring in the action area due to entrainment in the dredge devices; reduced fitness resulting from temporary increases in turbidity; reduced fitness resulting from temporary reduction in benthic prey; and disturbance from vessel traffic. The effects caused by these project components have been reduced or minimized by incorporating the minimization measures described in the *Proposed Action* section.

Entrainment in Dredge Devices

There is a very remote possibility that a juvenile coho salmon could be entrained during dredging and removed along with the dredge spoils. However, the work will occur when listed coho salmon use of the action area where dredging will occur is very low or absent, thus minimizing exposure of

juveniles and adults to dredging. Additionally, NMFS expects that coho salmon will avoid the work areas if present, thus the possible effects of entrainment are discountable.

Turbidity

As previously described in the *Effects to Critical Habitat* section, operation of the dredging and sediment disposal is expected to reduce water quality through the suspension of sediments and the resulting temporary increases in turbidity. Turbid waters are expected to extend no more than 1 nautical mile from work sites, and work is expected to be limited to only one portion of the action area at a time. Turbidity from dredge disposal sites at both Whaler Island and HOODS is expected to rapidly disspate due to ocean currents and the large mixing area. The work will occur when coho salmon use of the action area in the Harbor is low, or nonexistent thus minimizing exposure of both juveniles and adults. Coho salmon may be found using the HOODS site during the Project implementation. However, coho salmon will be able to avoid the work areas as ample suitable habitat is available within the action area at HOODS. Coho salmon are not expected to be within the vicinity of the Whaler Island disposal site when the Project is occurring. Therefore, NMFS expects no adverse effect to listed salmonids resulting from turbidity.

Benthic Prey Reduction

The proposed action will result in the temporary loss of some benthic food resources within the area of the dredge footprint of the Project and may also be smothered when dredge sediments are deposited. Given the proposed work window, the majority of the disturbance to prey resources in the action area will occur during times when coho salmon use of the action area is very low. As coho salmon use of the action area increases in the spring months the following year, the dredged and deposition areas would have had several months to recover and be recolonized by benthic organisms. Furthermore, the preferred prey resources for juvenile coho salmon (Dungeness crab larvae, Pacific herring larvae, harpacticoid copepods, etc) would not be affected by the Project. Because prey resources are not expected to be significantly affected, NMFS does not expect any fitness related consequences to individuals. Therefore, NMFS expects the effects of a temporary reduction in benthic prey to be insignificant.

Disturbance from Vessel Traffic

As described in the *Proposed Action* section, an increase in sound and disturbance related to the dredging work itself, in addition to the barges, scows, or tugs needed to transport dredge spoils is expected. The Fisheries Hydroacoustic Working Group (FHWG) has developed injury threshold criteria for listed fish species (FHWG 2008). The FHWG identified sound pressure levels of 206 dB-peak (peak decibels) at 10 m as being injurious to fish. Accumulated sound exposure levels (SEL) at 10 m of 187 dB for fishes that are greater than 2 grams are considered to cause temporary shifts in hearing, resulting in temporarily decreased fitness (i.e., reduced foraging success, reduced ability to detect and avoid predators) (FHWG 2008). The low level acoustics produced by vessels or from operation of the dredge are not likely to result in any negative physiological response or injury to any of the life stages of coho salmon. Vessel traffic may startle individual fish on the rare occasion when vessel traffic comes into close proximity of individuals. This brief startle response is not expected to result in any fitness consequence or increase rates of predation. Therefore, vessel traffic and associated disturbance is not expected to adversely affect SONCC coho salmon.

Aggregated Effects to Individual Salmon

There is little potential for combined effects given the size and location of where most of the activities are proposed to occur. For example, if a listed coho salmon is startled by vessel traffic, it

would leave and flee into other suitable habitat nearby before experiencing any sediment-related effects. NMFS concludes that all of the effects caused by the Project, when evaluated as a whole for the potential for combined or synergistic effects, would have an insignificant effect on individual coho salmon.

Conclusion
Based on this analysis, NMFS concurs with the Corps that the proposed action is not likely to adversely affect the SONCC coho salmon or their designated critical habitat.

Reinitiation of Consultation
Reinitiation of consultation is required and shall be requested by the Corps or by NMFS, where discretionary Federal involvement or control over the action has been retained or is authorized by law and (1) new information reveals effects of the action that may affect listed species or critical habitat in a manner or to an extent not previously considered; (2) the identified action is subsequently modified in a manner that causes an effect to the listed species or critical habitat that was not considered in this concurrence letter; or if (3) a new species is listed or critical habitat designated that may be affected by the identified action (50 CFR 402.16). This concludes the ESA portion of this consultation.

MAGNUSON-STEVENS FISHERY CONSERVATION AND MANAGEMENT ACT

Under the MSA, this consultation is intended to promote the protection, conservation and enhancement of EFH as necessary to support sustainable fisheries and the managed species' contribution to a healthy ecosystem. For the purposes of the MSA, EFH means "those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity", and includes the associated physical, chemical, and biological properties that are used by fish (50 CFR 600.10), and "adverse effect" means any impact which reduces either the quality or quantity of EFH (50 CFR 600.910(a)). Adverse effects may include direct, indirect, site-specific or habitat-wide impacts, including individual, cumulative, or synergistic consequences of actions.

This analysis is based, in part, on the EFH assessment provided by the Corps (2018) and descriptions of EFH for Pacific coast groundfish (PFMC 2012), coastal pelagic species (PFMC 1998), and Pacific coast salmon (PFMC 2014) contained in the FMPs developed by the Pacific Fishery Management Council and approved by the Secretary of Commerce.

Essential Fish Habitat Affected by the Project
The Pacific Fisheries Management Council (PFMC) has delineated EFH for Pacific Coast Salmon (PFMC 2014), Pacific Groundfish (PFMC 2012), and Coastal Pelagics (PFMC 1998) FMPs. EFH is defined in the MSA as those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity. NMFS regulations further define waters to include aquatic areas and their associated physical, chemical, and biological properties that are used by fish and may include aquatic areas historically used by fish where appropriate; substrate to include sediment, hard bottom, structures underlying the waters, and associated biological communities; necessary to mean the habitat required to support a sustainable fishery and the managed species contribution to a healthy ecosystem; and spawning, breeding, feeding, or growth to maturity to cover a species' full life cycle (50 CFR § 600.10).

In estuarine and marine areas, Pacific Coast Salmon EFH extends from the nearshore and tidal submerged environments within state territorial waters out to the full extent (200 miles) of the U.S. Exclusive Economic Zone (EEZ) offshore of Washington, Oregon, and California north of Point Conception to the Canadian border (PFMC 2014). The Pacific Groundfish EFH includes all waters from the mean high water line, and the upriver extent of saltwater intrusion in river mouths, along the coasts of Washington, Oregon, and California seaward to the boundary of the EEZ (PFMC 2012). The east-west geographic boundary of Coastal Pelagic EFH is defined to be 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 where sea surface temperatures range between 10ºC and 26ºC. The southern extent of EFH for Coastal Pelagics is the United States-Mexico maritime boundary. The northern boundary of the range of Coastal Pelagics is the position of the 10ºC isotherm, which varies both seasonally and annually (PFMC 1998). Thus, the proposed project occurs within EFH for various Federally-managed species in the Pacific Coast Salmon, Pacific Groundfish, and Coastal Pelagics FMPs.

Adverse Effects on Essential Fish Habitat

NMFS determined the proposed action would adversely affect EFH for Pacific Coast Salmon, Pacific Coast Groundfish, and Coastal Pelagic Species Fishery Management Plans as follows:

- Temporarily degraded water quality within the action area due to the generation of suspended sediment caused by dredging and disposal activities
- Temporary reduction in benthic prey after the dredging and disposal is complete and before recovery and recolonization occur

Adverse Effects to Water Quality

There is an expected temporary increase in turbidity during the dredging and spoil disposal. Brief episodes of turbidity will occur at HOODS and Whaler Island resulting from the disposal of dredge spoils. The high current and wind environment at HOODS and Whaler Island is expected to quickly ameliorate suspended sediments and turbidity. In addition, the duration of exposure will be temporary, which would reduce the duration of any adverse effects.

Effects of Reduction in Benthic Habitat/Prey

The proposed action will result in the temporary loss of some benthic food resources within the area of the dredge footprint of the Project. After dredging, the benthic environment will likely be largely devoid of life and will recover and be recolonized over time by benthic fauna and infauna. Most benthic species will have recovered or recolonized the area by the following season. Although recovery and recolonization may occur in several months, repeated annual dredging may cause adverse effects as the dredge area may not recover in between dredging efforts.

Effects to Eelgrass

NMFS does not expect eelgrass to occur in the work sites because of inadequate depths (eelgrass habitat occurs in higher elevations in the Harbor) and light conditions, as the dredge area is deeper than eelgrass usually resides. Therefore, no effects to eelgrass are expected from the dredging.

NMFS has determined that no conservation recommendations are warranted. The Corps must reinitiate EFH consultation with NMFS if the proposed action is substantially revised in a way that may adversely affect EFH, or if new information becomes available that affects the basis for NMFS' EFH conservation recommendations (50 CFR 600. 920(l)). This concludes the MSA portion of this consultation.

Please direct questions regarding this letter to Dan Free at (707) 825-5164 or Dan.Free@noaa.gov.

Sincerely,

Justin Ly
North Coast Branch Chief

ec: Mark Wiechmann, Corps of Engineers
Rebecca Garwood, CDFW
ARN File # 51422WCR2019AR00063

REFERENCES

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APPENDIX D: Coastal Zone Management Act Compliance

- Consistency Determination

DEPARTMENT OF THE ARMY
SAN FRANCISCO DISTRICT, U.S. ARMY CORPS OF ENGINEERS
450 GOLDEN GATE AVENUE
SAN FRANCISCO, CALIFORNIA 94102

April 23, 2019

Environmental Section B

Mr. John Ainsworth, Acting Executive Director
Attn: Larry Simon, Federal Consistency Manager
California Coastal Commission (CCC)
45 Fremont Street, Suite 2000
San Francisco, California 94105

Subject: Consistency Determination for 2019 Maintenance Dredging of Federal Navigation Channels at Crescent City Harbor

Dear Mr. Ainsworth:

Pursuant to Section 307c(1) of the Federal Coastal Zone Management Act of 1972, as amended, the United States Army Corps of Engineers, San Francisco District (USACE) is submitting a Consistency Determination (CD) for the 2019 maintenance dredging of Crescent City Harbor. This CD is attached.

The in-water construction will take place over a period of about 6 weeks (including mob and demob) at any time within the work window between July 1 and October 15, 2019, though due to possible schedule slippage, USACE requests a contingency extension through November 15. The work will focus on dredging the federal navigation channels to their congressionally-authorized depths (plus 2-feet of allowable overdepth). Up to 118,000 cubic yards of sediment will be removed. Sandy sediment will be placed nearshore off of Whaler Island, whereas siltier material will be disposed at the Humboldt Open Ocean Disposal Site (HOODS). Concerning the placement of sandy material near Whaler Island, a beach aggradation monitoring plan is included as an Appendix in the CD.

Should you have any questions or concerns, please contact Dr. Mark Wiechmann of my staff at mark.j.wiechmann@usace.army.mil, or at (415) 503-6846.

Sincerely,

Dr. Tessa E. Beach
Chief, Environmental Sections

Enclosures

CONSISTENCY DETERMINATION

Crescent City Harbor

Federal Navigation Channel 2019 Maintenance Dredging

April 2019

U.S Army Corps of Engineers
San Francisco District
Planning Branch, Environmental Section

Contents

Acronyms and Abbreviations

BMP.....Best Management Practices
CCA.....California Coastal Act of 1976, as amended
CCC.....California Coastal Commission
CCHD .....Crescent City Harbor District
CCMP.....California Coastal Management Program
CD.....Consistency Determination
CDFW .....California Department of Fish and Wildlife
C.F.R.....Code of Federal Regulations
CY .....cubic yards
CZMA .....Coastal Zone Management Act of 1972, as amended
Demob.....demobilization
EA .....Environmental Assessment
ESA.....Endangered Species Act
FONSI .....Finding of No Significant Impact
HOODS.....Humboldt Open Ocean Disposal Site
MLLW.....Mean Lower-Low Water
Mob .....mobilization
MSCMA.....Magnuson-Stevens Conservation and Management Act
NA .....Not applicable
NCRWQCB .....North Coast Regional Water Quality Control Board
NMFS.....National Marine Fisheries Service
NOAA.....National Oceanic and Atmospheric Administration
NTP .....Notice to Proceed
NTU.....Nephelometric Turbidity Units
O&M .....Operations and Maintenance
QC.....Quality Control
SPN.....San Francisco District
USACE.....United States Army Corps of Engineers, San Francisco District
USCG .....United States Coast Guard
USEPA .....United States Environmental Protection Agency
WDR.....Waste Discharge Requirements

1 Authority

The United States Army Corps of Engineers (USACE), San Francisco District (SPN), is submitting this Consistency Determination (CD) in accordance with the Federal Coastal Zone Management Act of 1972, as amended (CZMA) (Title 16 United States Code [U.S.C.] § 1451 *et seq.*), and its implementing regulations, *Federal Consistency with Approved Coastal Management Programs* (Title 15 Code of Federal Regulations [C.F.R.] Part 930); as well as USACE's operations and maintenance (O&M) dredging implementing regulations found at 33 C.F.R. Parts 335-338. Under these regulations, USACE is responsible for managing its maintenance dredging activities occurring in coastal zones in a manner consistent, to the maximum extent practicable, with the coastal zone management plans approved by the U.S. Department of Commerce, Office of Ocean and Coastal Resources Management. The coastal zone management plan applicable to USACE's maintenance dredging projects in Crescent City Harbor is the California Coastal Management Program (CCMP) administered by the California Coastal Commission (CCC).

The evaluation factors for the discharge of dredged material are contained in 33 C.F.R. Part 336.1(c). Most notably, "Navigation and Federal Standard. The maintenance of a reliable Federal navigation system is essential to the economic well-being and national defense of the country. The district engineer will give full consideration to the impact of the failure to maintain navigation channels on the national and, as appropriate, regional economy. The USACE regulates the discharge of dredged material from its projects to assure that dredged material placement occurs in the least costly, environmentally acceptable manner, consistent with engineering requirements established for the project. The environmental assessment or environmental impact statement, in conjunction with the 40 C.F.R. Part 230 - Section 404(b)(1) guidelines and public notice coordination process, can be used as a guide in formulating environmentally acceptable alternatives. The least costly alternative, consistent with sound engineering practices and selected through the Section 404(b)(1) guidelines or ocean disposal criteria, will be designated the Federal Standard for the proposed project."

The existing federal project for the improvement of the Crescent City Harbor, was authorized by the Rivers and Harbors Act of 1918, based on the report printed in House Document 434 of the 64th Congress, First Session, and provided for construction of a rubble mound outer breakwater. The Crescent City Harbor District (CCHD) is the non-federal sponsor for the project.

2 Determination

Pursuant to the CZMA, USACE-SPN has evaluated Crescent City Harbor's O&M dredging activities. The USACE has determined that the proposed calendar year 2019 maintenance dredging of Crescent City Harbor's federal navigation channels, with the placement of sandy dredged material at Whaler Island and disposal of siltier dredged material at the Humboldt Open Ocean Disposal Site (HOODS), is consistent to the maximum extent practicable with the CCMP, pursuant to the requirements of the CZMA and the California Coastal Act of 1976, as amended (CCA), and would not adversely affect coastal resources. The basis of this finding is found within this document; therefore, USACE requests CCC's concurrence with this CD.

3 Project Areas and Activities Subject to Consistency Determination

Section 304(1) of the CZMA defines the coastal zone as *"…the coastal waters (including lands therein and there under), strongly influenced by each other and in proximity to the shorelines of the several coastal states, and includes islands, transitional and intertidal areas, salt marshes, wetlands, and beaches*."

The coastal zone is further defined by Section 30103(a) of the CCA as *"…land and water area of the State of California from the Oregon border to the border of the Republic of Mexico…extending seaward to the state's outer limit of jurisdiction, including all offshore islands, and extending inland generally 1,000 yards from the mean high tide line of the sea. In significant coastal estuarine, habitat, and recreational areas it extends inland to the first major ridgeline paralleling the sea or five miles from the mean high tide line of the sea, whichever is less, and in developed urban areas the zone generally extends inland less than 1,000 yards.*"

The proposed dredging/disposal activities would be located within areas defined as *Coastal Zone* by Section 304(1) of the CZMA and Section 30103(a) of the CCA.

The Crescent City Harbor O&M dredging project is located within the Crescent City Harbor District, Del Norte County, California. The Harbor is situated on the coast of Northern California, adjacent to Crescent City (Figure 1), approximately 280 nautical miles north of San Francisco, California and 17 nautical miles south of the Oregon border. It occupies a natural indentation in the coastline (Figure 2) and is protected by a 4,700-foot manmade rubble mound outer breakwater to the west; a 2,400-foot manmade sand barrier to the east which at its southern terminus is anchored to a relatively small rocky mass called Whaler Island; a 1,600-foot inner breakwater to the south; and the topography of the coastline to the north. The Harbor's opening faces southeast and is approximately 2,000 feet across (Figure 3).

The entrance to Crescent City Harbor is protected from prevailing northwesterly and westerly winds and seas by the outer breakwater. Crescent City Harbor is a shallow draft federally designated Critical Harbor of Refuge, supporting a U.S. Coast Guard (USCG) search and rescue station, commercial and sport fishing, waterfront industry, and recreational boating. Crescent City Harbor is the only harbor of refuge between Coos Bay, Oregon and Fort Bragg, California, and it is one of only a few in the world that is tsunami resistant (rebuilding completed in 2014).

Dredging activities in 2019 would occur in three federal navigation channels within the harbor: the Entrance Channel, the Inner Harbor Basin Channel, and the Marina Access Channel (Figures 3). The harbor is authorized for scheduled maintenance every five years, contingent on Congressional funding. It is USACE's responsibility, in coordination with the non-federal sponsor (CCHD), to maintain the channels to their authorized depths.

Placement of dredged material would occur at two locations, depending on where it was dredged from. Sediment from the Entrance Channel, that was determined to be greater than 80% sand content from recent (April 2019) sediment testing, would be placed within waters just off of Whaler Island (pink triangular area, Figure 3) where it is expected to disperse. Material dredged from the Inner Harbor Basin Channel is compositionally much siltier and as such, will be disposed of at HOODS, which is approximately 66 nautical miles south of Crescent City Harbor (Figure 1). HOODS was designated as a Section 102 disposal site of the Marine Protection, Research and Sanctuary Act in September 1990 for a period of 50 years. The Marina Access Channel is between 75-80% sand content, but has low organic matter content such that it qualifies for placement within waters just off of Whaler Island.

South Beach is located just to the east of the 2,400-foot sand barrier ending at Whaler Island, extending southeastward along the coastline in between US Highway 101 and the Pacific Ocean (Figure 2). In placing sandy sediment off of Whaler Island (Figure 3), questions have been raised regarding the movement of and potential impacts from this material. The potential impact of concern is that sandy material may block the existing culvert drainages from the Crescent City Marsh. The marsh, containing the Western lily, which is recognized by the U.S. Fish and Wildlife Service (USFWS) as an endangered plant species, is located on the opposite side of Highway 101 from the South Beach area. A monitoring plan (Appendix A) has been developed to evaluate if this potential impact is occurring.

Elk Creek is a freshwater tributary that discharges under Highway 101 into Crescent City Harbor near the center of the Harbor's shoreline. The headwaters of Elk Creek originate in the Jedediah Smith Redwood State Park, a protected and relatively intact forested area east of Crescent City (Figure 3). According to the California Department of Fish & Wildlife (CDFW), the Elk Creek system does have a consistent population of Coho salmon, however, the observed number of spawning adults are low and few juveniles are encountered (Garwood 2012, 2018).

Surveys of eelgrass beds in Crescent City Harbor have been taken each year since 2012 for the Outer Boat Basin maintenance dredging, performed by the CCHD. As part of the project, eelgrass transplanting occurred so as to mitigate dredging impacts to eelgrass beds. The latest eelgrass survey was conducted in 2018 as part of the Year-5 post-mitigation eelgrass monitoring (Merkel & Associates, Inc. 2018). The report indicates that the aerial extent of eelgrass in Crescent City Harbor has expanded since 2013 and that the size of the eelgrass beds are roughly similar to what was observed in 2017. Overall, eelgrass beds within the harbor remain stable.

4 Purpose and Need for the Proposed Action

Crescent City Harbor experiences sedimentation from only a few sources, including ocean input through the approximately 2,000'-wide entrance, from Elk Creek to the north, and limited inflow from intermittent gulches and sheet runoff. Over time, the unending natural process of gradual sediment accumulation ("shoaling") will constrict navigation in the channels and cause a safety hazard. Periodic maintenance dredging is essential to the continued safe and efficient use of the channels, and thereby protects and enhances the local economy.

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

5 Project Description

There are currently three federally constructed and maintained navigation channels in Crescent City Harbor (Figure 3). The Inner Harbor Basin Channel extends 2,200 feet along the inside and around the tip of the inner breakwater, where it connects to the Entrance Channel, a 200-foot-wide channel that extends 2,200 feet to the outer

breakwater. The Marina Access Channel is 140 to 210 feet wide and extends 1,200 feet from the Inner Harbor Basin Channel to the small boat basin.

Each of the three channels is congressionally-authorized to a depth of -20 feet mean lower-low water (MLLW), with varying maintenance depths: -20 feet MLLW within the Entrance Channel, -15 feet MLLW within the Inner Harbor Basin Channel, and -15 feet MLLW within the Marina Access Channel. To achieve these depths, the project includes an additional 2 feet of allowable overdepth.

Figure 1. Crescent City Harbor project vicinity map.

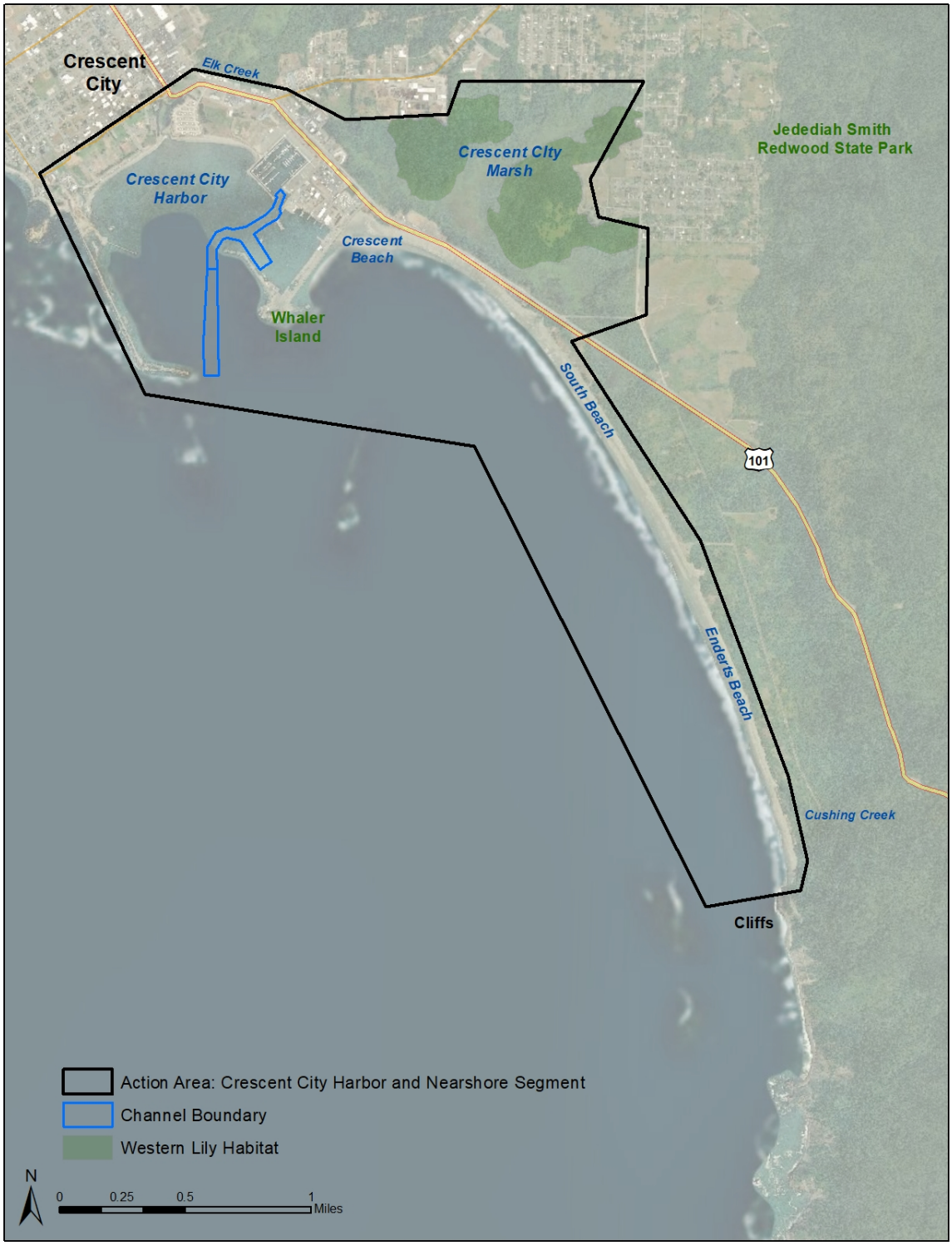

Figure 2. Crescent City Harbor action area.

Figure 3. Project area detail.

6 Historical Shoaling Activity and Proposed Dredge Volumes

As shown in Table 1, USACE historical records indicate that a total of some 896,600 cubic yards (CY) have been dredged from the Crescent City Harbor federal channels between 1936 and 2011.

Table 1. Crescent City Harbor Historical Dredged Volumes & Disposal Sites

Year	Channels	Volume (CY)	Disposal Site
1936	Inner Harbor Basin and Entrance Channels	48,449	Unknown
1937	Inner Harbor Basin and Entrance Channels	27,756	Unknown
1938	Inner Harbor Basin and Entrance Channels	16,353	Unknown
1939	Inner Harbor Basin and Entrance Channels	58,396	Unknown
1956/1957	Inner Harbor Basin and Entrance Channels	120,466	Unknown
1964/1965	Inner Harbor Basin and Entrance Channels	187,372[a]	Unknown
1976	Inner Harbor Basin and Entrance Channels	61,013	SF-1
1982	Inner Harbor Basin and Entrance Channels	125,319	SF-1
1983	Inner Harbor Basin and Entrance Channels	40,221	SF-1
1988	Inner Harbor Basin and Entrance Channels	62,192	Whaler Island
1990	HOODS established	NA	NA
1993	Inner Harbor Basin and Entrance Channels	37,487	Whaler Island
1999/2000	Entrance Channel and Access Channel	35,000	Whaler Island & Dredge Ponds
2002	Crescent City Floating Dock Relocation	NA	NA
2005	USCG Dorado Moorings Repair	NA	NA
2009	Access Channel	34,947	Whaler Island & Dredge Ponds
2011	Various Tsunami related repairs (boat basin/docks)	NA	NA
2011[b]	Inner Harbor Basin and Entrance Channels	41,630	Whaler Island & Dredge Ponds
Total		**896,601**	

Notes:

a. The 1964 tsunami may have contributed to the larger than usual volume.

b. Due to funding and placement/disposal site capacity constraints, the Inner Harbor Basin and Entrance channels were only dredged to -14 feet MLLW (with 1 foot of overdepth) in 2011, instead of the typically maintained -15 and -20 feet MLLW, respectively.

Based on 1936 to 2000[1,2] dredged volumes, the average shoaling and dredging rate for the Entrance and Inner Harbor Basin Channels was approximately 12,000 CY of material per year. A 2005[2] hydrographic survey estimated the average shoaling rate for the Access Channel to be approximately 8,000 CY per year since its deepening in 2000. Therefore, it is estimated that the combined average shoaling and dredging rate for the Entrance, Inner Harbor Basin, and Access Channels is nearly 20,000 CY per year.

The Marina Access Channel was last dredged in 2009, and the Inner Harbor Basin and Entrance Channels were last dredged in 2011. Due to funding and placement/ disposal site capacity constraints, the Inner Harbor Basin and Entrance Channels were only dredged to -14 feet MLLW (with 1 foot of overdepth) in 2011.

Based on a recent hydrographic survey, conducted 19 February 2019, USACE-SPN proposes to remove up to 118,000 CY of sediment from the three federal channels, so as to achieve their regularly maintained depths (which includes two feet of allowable overdepth):

1. Entrance Channel = 71,934 CY]
2. Inner Harbor Basin Channel = 22,838 CY] Grand total = 117,559 CY
3. Marina Access Channel = 22,787 CY]

The grand total amount (~118,000 CY) calculated from the hydrographic survey, is distinctly less than the volume of shoaling predicted by the historical record.

7 Sediment Chemistry

Physical data from previous sampling events (1993, 1998, 2003, and 2009) indicate that sediment from the Entrance Channel predominantly consisted of greater than 80% sand with little or no organic matter, that sediment from the Marina Access Channel consists of silty-sand with moderate organic matter, and that sediment from the Inner Harbor Basin Channel is predominantly fine grain silty material with high amounts of organic matter.

The current sampling event (report issued April 2019) likewise states that sandy material from the Entrance Channel is suitable for nearshore placement off of Whaler Island (or "Whaler Island" for short), as is the slightly less sandy material from the

[1] Dredge volumes after 2000 are not included to determine the average shoaling and dredging rate because the 2011 dredge event did not dredge to the maintained project depth or include overdepth.

[2] Due to tsunamis in 2006 and 2011, more recent shoaling estimates and dredge volumes are not likely indicative of typical shoaling in Crescent City Harbor or the federal channels. Thus, historical pre-tsunami estimates are used to conservatively estimate shoaling for planning purposes.

Access Channel which is between 75-80% sand, but has a low content of organic matter. The Inner Harbor Channel is too silty for placement at the Whaler Island placement site, but is considered suitable for disposal at HOODS.

Sediment chemistry and toxicity data produced from previous sampling events indicate that sediment from all three channels meet criteria specified by the various placement/disposal options. Specifically, per the Dredged Material Management Plan prepared for this project, material from the Entrance Channel, which is predominantly sandy, is suitable for nearshore placement at Whaler Island, while the silty material from the Inner Harbor Basin and Marina Access Channels is suitable for disposal at the Humboldt Open Ocean Disposal Site (HOODS).

The current sampling event (report issued April 2019) likewise states that sandy material from the Entrance Channel is clean and non-toxic, and therefore suitable for placement at Whaler Island. Sediment tested from the Marina Access Channel is likewise sandy and clean (low organic matter content) and non-toxic. As such, for the proposed maintenance dredging, it is determined to be suitable for placement at Whaler Island as well. Material from the Inner Harbor Basin Channel as tested is determined to be suitable only for ocean disposal, and specifically at HOODS.

8 Dredging Methods and Proposed Disposal Sites

Monitoring required by the Waste Discharge Requirements (WDR) of the North Coast Regional Water Quality Control Board, and best management practices for dredging activities are listed in Appendix B. The sediment suitability letter, based on recent (April 2019) testing, identifies where sediment from each federal channel is suitable for placement or disposal. It is included as Appendix C.

8.1 Hydraulic (Cutterhead) Dredging

Sandy material that is placed at Whaler Island would be dredged primarily from the Entrance Channel, and possibly from the Marina Access Channel, by a 1,500 to 2,500 horsepower hydraulic cutterhead dredge. The dredged slurry is expected to consist of 80-90% water and 10-20% solids by volume. This ratio is dependent upon several factors, such as physical characteristics of the dredged material, thickness of the dredge cuts (e.g., thin cuts result in more water and less sediment), and transport distance.

A dredge pipeline would transport dredged slurry to the Whaler Island placement site (Figure 3). Depending on which areas are being dredged, the length of the pipeline would range from 1,500 to 3,000 feet. If navigational access over the pipeline is required, one or more sections of the pipeline can be submerged and anchored to the

bottom of the seafloor. A booster pump may be needed to accommodate the maximum pumping distance. Buoys would be positioned to warn boaters of the pipeline's presence.

Because of concerns about sediment potentially clogging the three culverts along Highway 101, a monitoring plan (Appendix A) has been created, in conjunction with several resource agencies (CCC, CDFW, USFWS), to outline USACE's responsibility in monitoring the sandy dredged sediment being placed off of Whaler Island. The marsh is located on the opposite side of Highway 101 from the South Beach area. Placement of sandy material near Whaler Island is at the northern end of South Beach.

The concern is that if sandy dredged material clogs the culverts, water will back up and potentially drown the Western lily, a federally endangered plant species found in Crescent City Marsh. The potential impact has been a matter of dispute for some time; USACE has agreed to monitor beach profiles after placement of sandy material near Whaler Island in 2019 in order to settle this question.

8.2 Mechanical (Clamshell) Dredging

Fine-grained material dredged from the Inner Harbor Basin Channel, and perhaps the Marina Access Channel, would be dredged by an approximately 500 horsepower mechanical dredge. The mechanical dredge, typically powered by a diesel generator, would then lower and raise the dredge bucket through the water column using a series of cables and winches. The weight of the dredge bucket allows it to sink into the mud, with the cables restricting the clamshell from falling too deep or beyond the maximum allowable overdepth. The dredge bucket is then closed, raised up through the water column, and swung over to place material into a bottom dump or split hull barge. Unlike hydraulic dredging, little additional water is entrained by mechanical dredging equipment.

Once a haul barge is full, it would be transported by a larger tug (approximately 3,000 horsepower) some 66 miles south to HOODS. The doors along the bottom of the barge would be opened, and the dredged sediment would be disposed at the site. Due to sediment mounding, a map of the HOODS cells that are open for disposal is found in Figure 4 (map prepared by U.S. Environmental Protection Agency, Region 9 [USEPA]).

The mechanical dredging could be done in parallel with the hydraulic dredging, the in-water duration of which, including mobilization (mob) and demobilization (demob), is estimated at about 6 weeks total.

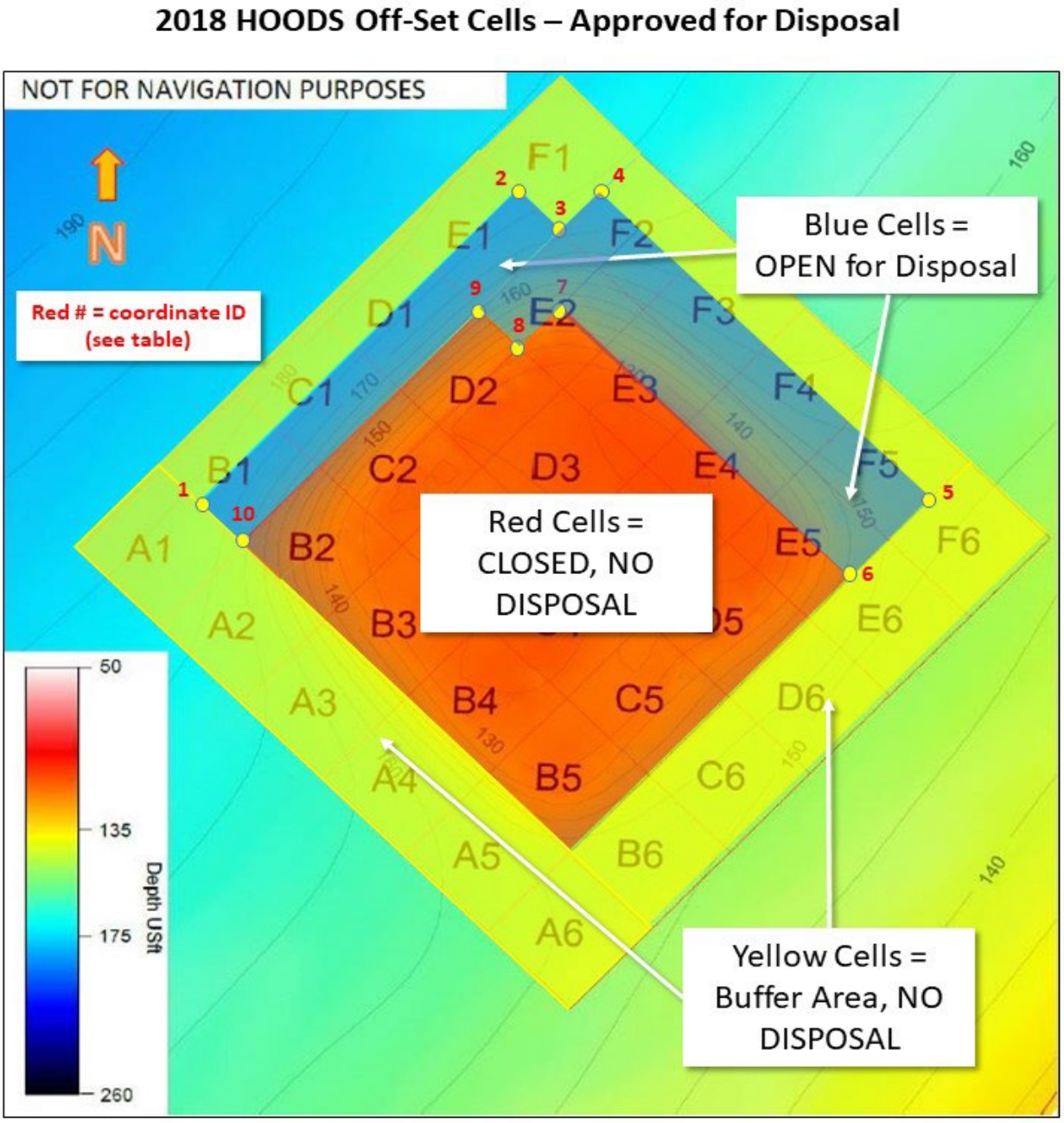

Figure 4. HOODS Cells that are approved for disposal by USEPA.

9 Timing and Duration

For calendar year 2019, the USACE proposes to maintenance dredge the federal navigation channels at Crescent City Harbor within the environmental work window, which is July 1 – October 15, as established by the CDFW, and which USACE recognizes as a matter of comity. USACE also requests an extension of the CDFW work window to November 15, provided that heavy rains have not yet begun.

The work, from the Notice to Proceed (NTP) order to the contractor, will consist of two parts. The first part is preliminary, taking up to 8-weeks for written submittals (Environmental Protection Plan, Safety Plan, Quality Control Plan, etc.) and for mob. The second part involves in-water construction activity, both hydraulic and mechanical, and is scheduled to last up to 6 weeks. The in-water activity will consist of 3 weeks for dredging and 3 weeks for contractor survey, the clean-up of high spots, and demob.

As currently scheduled, the contract award, and NTP, is planned for early- to mid-August 2019. Because inclement weather with rough seas is expected in October, it is SPN's hope that in-water work can be completed by the end of September. Even so, SPN still seeks to extend the work window out to November 15 (barring heavy rains), and acknowledges that it may become necessary to postpone dredging activities into calendar year 2020.

10 Consistency with Provisions of the California Coastal Act

10.1 Article 1, General *(Sections 30000 – 30200)*

Maintenance dredging is specifically permitted under the Coastal Act, Section 30233 (Diking, Filling or Dredging). Dredging, to maintain existing depths in navigation channels, is permitted in Section 30233(a)(2) where there is no feasible less-environmentally damaging alternative, and where feasible mitigation measures are provided to minimize adverse environmental effects. Therefore, the project is consistent with the allowable use, alternatives, and mitigation tests contained in the dredge and fill policy of Section 30233.

10.2 Article 2, Public Access *(Sections 30210 – 30214)*

Article 2 of the CCA requires that development shall not interfere with the public's right of access to the sea.

Minor impacts to public access may occur during dredging operations. To ensure public safety, the areas around machinery and dredging operations will not be accessible to the general public. This restriction is temporary in nature and not

expected to result in any long-term adverse impacts on public access. In the long term, dredging of the federal channels would benefit public access and navigation within the Crescent City Harbor.

10.3 Article 3, Recreation *(Sections 30220 – 30224)*

Article 3 of the CCA in general requires:

- Coastal areas suited for recreational activities shall be protected for such uses and place priority on development of recreational or visitor-serving uses rather than residential uses;
- Upland areas necessary to support coastal recreation uses shall be reserved for such uses; and
- Recreational boating use of coastal waters shall be encouraged.

Areas immediately adjacent to machinery and dredging operations will not be accessible to the public during this relatively short dredging episode. This restriction is temporary in nature, and not expected to result in any long-term adverse impacts on recreation. In the long term, dredging of the federal channels would benefit access to boating and other recreational uses within Crescent City Harbor.

10.4 Article 4, Marine Environment *(Sections 30230 – 30237)*

Article 4, Sections 30230 and 30231 of the CCA, requires that marine resources be maintained, enhanced, and where feasible, restored, and that special protection be given to areas and species of special biological or economic significance. It further requires that uses of marine environments be such that habitat function, biological productivity, healthy species populations, and fishing and recreational interests of coastal waters are maintained for long-term commercial, recreational, scientific, and educational purposes.

As noted under Article 1, dredging to maintain existing depths, or to restore previously dredged depths in navigational channels is permitted in Section 30233(a)(2) where there is no feasible less-environmentally damaging alternative, and where feasible mitigation measures are provided to minimize adverse environmental effects.

10.5 Article 5, Land Resources *(Sections 30240 – 30244)*

Article 5 contains the heart of the CCA as it applies to protecting fish and wildlife habitat and species. This article requires that environmentally sensitive habitat areas be protected against any significant disruption of habitat values and further that only uses dependent upon these resources be allowed to utilize them. This article extends this

protection to prime agricultural lands, lands suitable for agricultural use, archaeological and paleontological resources, as well as productive soils and timberlands.

In concert with this article, nearby wetlands and sensitive plant habitat will be monitored during and after dredging activities as a mitigation measure. Specifically, in order to avoid potential impacts to the Crescent City Marsh, where the federally listed Western lily has been observed, a proposed monitoring plan that involves taking land surveys immediately before and following placement of sandy dredged material at Whaler Island, and also quarterly surveys for the year following the dredging activity. The surveys will be conducted at low tide along five transects. Details of the monitoring plan, with a figure showing the five transects, are provided in Appendix A.

With proper on-site management, the project is not anticipated to result in adverse impacts to land resources. Additionally, the monitoring program, when implemented, will provide a wealth of data that should be useful in planning future dredge episodes, concerning sediment transport around Whaler Island and subsequent sand deposition along South Beach and near the Highway 101 culverts.

10.6 Article 6, Development *(Sections 30250 – 30255)*

Article 6 applies to new residential, commercial, or industrial development and requires that new development be contiguous with, or in close proximity to, existing developed areas. It requires that scenic and visual qualities of coastal areas be considered as a resource of public importance, and be protected during the process of development. Additionally, it maintains that new development shall not impede access to coastal resources, minimize risks to life and property, and be serviceable by public works.

The proposed maintenance dredging is not a development project and, therefore, Article 6 does not apply to this project.

10.7 Article 7, Industrial Development *(Sections 30260 – 30265)*

Article 7 states that the CCC has permitting authority over all offshore oil and gas development within the three-mile jurisdiction and onshore facilities within the coastal zone. Further, it encourages coastal-dependent industrial facilities to be located or expanded within existing sites.

The proposed maintenance dredging does not involve industrial development; as such, Article 7 does not apply to this project.

11 References Cited

Garwood, J. 2012, Historic and recent occurrence of Coho salmon (*Oncorhynchus kisutch*) in California streams within the Southern Oregon/ Northern California Evolutionary Significant Unit, California Department of Fish and Wildlife report, Arcata CA, 77p.

Garwood, J. 2018, A Survey of Aquatic Habitats, Fishes and other Aquatic Fauna of Elk Creek, Crescent City, California, California Department of Fish and Wildlife report, Arcata CA, 15 p.

Merkel & Associates, Inc. 2018, Year 5 Post-mitigation Eelgrass Monitoring Report, Crescent City Harbor Outer Boat Basin Project, Crescent City, California, 18 p.

Appendix A

South Beach Monitoring Plan

April 2019

Appendix B

Water Quality Monitoring & Best Management Practices

A number of avoidance, minimization and conservation measures will be implemented as part of the proposed action in order to minimize impacts to federally listed species within the vicinity. These measures include:

WDR Water Quality Monitoring

The USACE will conduct water quality monitoring during dredging in accordance with the North Coast Regional Water Quality Control Board's (RWQCB's) Waste Discharge Requirements (WDR), No. R1-2000-59. This monitoring program involves:

- Receiving water samples in the vicinity of the Whaler Island site shall be collected weekly, within one hour of high tide, and tested for turbidity (NTU). A background sample, unaffected by the discharge at Whaler Island, shall be collected (suggested location—near the ice house at the end of Citizen's Dock Road); a second sample shall be taken within 200 feet (61 meters) of the point of entrance of the discharge into the waters near Whaler Island.
- Turbidity shall not be increased by more than 20% above naturally occurring background levels. Also, waters shall not contain substances in concentrations that result in deposition of material that cause nuisance, and further, the suspended sediment load shall not be altered in such a manner as to adversely affect beneficial uses.
- Monitoring reports shall be submitted on a monthly basis.

General Best Management Practices (BMP)

- Vessels will be operated in compliance with all applicable regulations related to the prevention of water pollution by fuel, harmful substances, and accidental discharges. Dredged material will be secured during transport to HOODS, with precautions in place to minimize any risk of spills.
- To ensure that contaminants are not accidently introduced into the waterway, the on-site QC contractor will implement standard spill prevention and response measures in and around the proposed project area. The contractor responsible for operating the dredging equipment shall be responsible for ensuring that such measures are adhered to.
- Floating debris will be removed from the water and disposed of properly.
- All dredged material will be handled and transported such that it does not re-enter surface waters outside of the immediate protected work area.

Dredging Activity BMP Measures

- Dredging at each project location will continue to be limited to the approved project depth plus allowable overdepth.
- Specific mechanical dredging BMP measures will include:
    - Multiple horizontal dredge cuts will be taken where a thick horizontal volume needs to be dredged, in order to avoid overfilling the bucket and causing spillage.
    - No overflow or decant water will be allowed to be discharged from any barge.
- Specific hydraulic dredging BMP measures will include:
    - Pipeline pumps will only be turned on when the cutterhead intakes are on the seafloor or within 3 feet (0.9 meters) of the seafloor when priming pumps.
    - Cutterhead intakes will be monitored so that they maintain positive contact with the seafloor during suction dredging.

Appendix C

Sediment Suitability Letter

DEPARTMENT OF THE ARMY
SAN FRANCISCO DISTRICT, US ARMY CORPS OF ENGINEERS
450 GOLDEN GATE AVENUE, 4TH FLOOR
SAN FRANCISCO CALIFORNIA 94102

April 12, 2019

Environmental Section B

Mr. Brian Ross
USEPA, Region IX
75 Hawthorne Street
San Francisco, CA 94105-3919

Mr. Brandon Stevens
North Coast Regional Water Quality Control Board
5550 Skyline Blvd Ste A
Santa Rosa, CA 95403-1072

Dear Mr. Ross and Mr. Stevens,

The US Army Corps of Engineers (USACE) San Francisco District is preparing to dredge the federal channels at Crescent City Harbor. Final details for the project will be conveyed by separate cover for the dredging event.

In support of this dredging event the channel was sampled in September of 2018. USACE is pleased to provide the enclosed Sampling and Analyses Report (SAR) for your review. The placement options evaluated during this sampling effort were the Humboldt Open Ocean Disposal Site (HOODS), Whaler Island near-shore site, and the Harbor District's Upland Disposal Site. Based on the results of this sampling event, USACE has made the following assessment:

- Shoaled material in the Entrance Channel is suitable for placement at Whaler Island, at HOODS and in the Upland Disposal Site.
- Shoaled material in the Inner Harbor Basin Channel is suitable for placement at HOODS and in the Upland Disposal Site.
- Shoaled material in the Marina Access Channel is suitable for placement at Whaler Island, at HOODS, and in the Upland Disposal Site.

I request your concurrence with our findings above. Please contact Mr. Ed Keller, of my staff, if you have any questions or comments or if you need any additional information. Mr. Keller can be reached at (415) 503-6841 or by e-mail at Edward.P.Keller@usace.army.mil.

Sincerely,

Dr. Tessa Beach
Chief, Environmental Sections

Enclosure

APPENDIX E: DRAFT Finding of No Significant Impact (FONSI)

DRAFT

FINDING OF NO SIGNIFICANT IMPACT

2019 Crescent City Harbor Federal Channels Maintenance Dredging

Del Norte County, California

The U.S. Army Corps of Engineers, San Francisco District (Corps) has conducted an environmental analysis in accordance with the National Environmental Policy Act of 1969, as amended. The Draft Environmental Assessment (EA) dated April 2019, for the 2019 Crescent City Harbor Federal Channels Maintenance Dredging project addresses the need to perform maintenance dredging to provide for continued safe and reliable commercial and recreational navigation opportunities and in Crescent City Harbor, Del Norte County, California.

The Draft EA, incorporated herein by reference, evaluated various alternatives that would accomplish maintenance dredging of the federal navigation channels and placement of dredged material in the study area. The recommended plan is the Proposed Action and includes:

- Hydraulically (cutterhead) dredging approximately 104,054 cubic yards of sandy material from the Entrance Channel & Marina Access Channel and pumping it for placement at Whaler Island;

- Mechanically (hopper) dredging approximately 25,231 cubic yards of silty material from the Inner Harbor Basin Channel and transporting it 66 miles by barge for placement at HOODS.

In addition to a "no action" plan, three action alternatives were considered, two were eliminated from further study, and one action alternative was evaluated in the EA. The alternatives included The Proposed Action of dredging and placing material at the Whaler Island and HOODS disposal sites; an alternative of dredging and placing material at the HOODS and Rogue disposal sites; and an alternative of dredging and placing material at the HOODS, Chetco, and Rogue disposal sites. The alternatives other than the Proposed Action were eliminated from further study in the EA because the Rogue and Chetco disposal sites are not currently available for material from the Crescent City Harbor Federal Channels.

For all alternatives, the potential effects were evaluated, as appropriate. A summary assessment of the potential effects of the recommended plan (Proposed Action) are listed in Table 1:

Table 1: Summary of Potential Effects of the Recommended Plan

	Insignificant effects	Insignificant effects as a result of mitigation*	Resource unaffected by action
Aesthetics	☒	☐	☐
Air quality	☒	☐	☐
Aquatic resources/wetlands	☒	☐	☐
Fish and wildlife habitat	☒	☐	☐
Threatened/Endangered species/critical habitat	☐	☒	☐
Historic properties	☐	☐	☒
Other cultural resources	☐	☐	☒
Hazardous, toxic & radioactive waste	☒	☐	☐
Hydrology	☒	☐	☐
Navigation	☒	☐	☐
Noise levels	☒	☐	☐
Socio-economics	☒	☐	☐
Environmental justice	☒	☐	☐
Geology, Soils, Seismicity	☒	☐	☐
Water quality	☒	☐	☐
Recreation	☒	☐	☐

All practicable and appropriate means to avoid or minimize adverse environmental effects were analyzed and incorporated into the recommended plan. Best management practices (BMPs) as detailed in the EA will be implemented, if appropriate, to minimize impacts. The following mitigation measures are proposed in the EA:

- **MM-TE-01**: A monitoring and response plan (Appendix A of the EA) will be implemented to verify there will be no adverse impacts to Endangered Western lily habitat. Daily observations will be made during dredging to determine whether flow through the culverts under U.S. Highway 101 is being impeded by accumulation of material on the downstream portions of the beach. If it is determined that flow is being impeded, the contractor will be required to contact the USACE in order to determine a corrective course of action. (See EA Section 4.11)

- **MM-TE-02**: The California Regional Water Quality Control Board (CRWQB) Monitoring and Reporting Program No. R1-2000-59 (Revised December 30, 2004) for Crescent City Harbor District Maintenance Dredging requirements, including effluent and receiving water monitoring at Whaler Island during placement and an annual biological survey the summer following placement, will be followed during dredging and placement activities. (See EA Section 4.11)

- **MM-CR-01**: If an inadvertent discovery is made USACE would immediately halt all soil- and sediment-disturbing activities within the area of the find, as appropriate. Prehistoric cultural material includes, but is not limited to: chert or obsidian flakes, projectile points, mortars, and pestles, dark friable soil containing shell and bone dietary debris, heat-

affected rock, human burials, shell midden deposits, hearth remains, and stone and/or shell artifacts. Historic material that may occur within aquatic environments, includes but is not limited to, ship remains, maritime-related structures and remains with square nails, whole or fragmentary ceramic, glass or metal objects, wood, nails, brick, anchors, barge remnants, dumpsites, or other materials. A USACE archaeologist or other qualified archaeologist would then ascertain the nature of the discovery, the significance of the find, and provide proper management recommendations. (See EA Section 4.4)

No compensatory mitigation is required as part of the recommended plan.

Public review of the draft EA and FONSI was completed on **(DATE DRAFT EA AND FONSI REVIEW PERIOD ENDS)**. All comments submitted during the public review period were responded to in the EA and FONSI.

OTHER ENVIRONMENTAL AND CULTURAL COMPLIANCE REQUIREMENTS

ENDANGERED SPECIES ACT

Pursuant to section 7 of the Endangered Species Act of 1973, as amended, the U.S. Army Corps of Engineers determined that the recommended plan may affect but is not likely to adversely affect the following federally listed species or their designated critical habitat:

- Southern Oregon/Northern California Cost (SONCC) coho salmon
- North American Green Sturgeon
- Stellar Sea Lion
- Marbled Murrelet
- Tidewater Goby
- Western Lily

The National Marine Fisheries Service (NMFS) concurred with the Corps' determination on 26 March 2019. A response from the U.S. Fish and Wildlife Service is pending and will be obtained before the determination that a FONSI is appropriate.

MAGNUSON-STEVENS FISHERY CONSERVATION AND MANAGEMENT ACT

Pursuant to the Magnuson-Stevens Fishery Conservation and Management Act, as amended by the Sustainable Fisheries Act of 1996 (Public Law 104-267), the U.S. Army Corps of Engineers determined that the recommended plan may adversely affect EFH for the fisheries present in the project area. The NMFS responded and concurred with the USACE determination on 26 March 2019 but concluded that no EFH conservation recommendations were warranted.

NATIONAL HISTORIC PRESERVATION ACT

Pursuant to Section 106 of the National Historic Preservation Act of 1966, as amended, the U.S. Army Corps of Engineers determined that the recommended plan has no effect on historic properties.

CLEAN WATER ACT SECTION 404(B)(1) COMPLIANCE

Pursuant to the Clean Water Act of 1972, as amended, the discharge of dredged or fill material associated with the recommended plan has been found to be compliant with section

404(b)(1) Guidelines (40 CFR 230). The Clean Water Act Section 404(b)(1) Guidelines evaluation is found in Appendix B of the EA.

CLEAN WATER ACT SECTION 401 COMPLIANCE

Pursuant to section 401 of the Clean Water Act, water quality coverage under the existing Waste Discharge Requirements (RWQCB Order R1-2000-59) associated with dredging and placement of material from the Crescent City Harbor at Whaler Island placement site will obtained from the North Coast Regional Water Quality Control Board prior to construction. All conditions of the water quality certification will be implemented in order to minimize adverse impacts to water quality.

COASTAL ZONE MANAGEMENT ACT

A determination of consistency with the California Coastal Zone Management program pursuant to the Coastal Zone Management Act of 1972 will be obtained from the California Coastal Commission prior to construction. All conditions of the consistency determination shall be implemented in order to minimize adverse impacts to the coastal zone.

DETERMINATION AND STATEMENT OF FINDING

All applicable environmental laws have been considered and coordination with appropriate agencies and officials has been completed.

Technical, environmental, and economic criteria used in the formulation of alternative plans were those specified in the Water Resources Council's 1983 Economic and Environmental Principles and Guidelines for Water and Related Land Resources Implementation Studies. All applicable laws, executive orders, regulations, and local government plans were considered in evaluation of alternatives. Based on this report, the reviews by other Federal, State and local agencies, Tribes, input of the public, and the review by my staff, it is my determination that the recommended plan would not cause significant adverse effects on the quality of the human environment; therefore, preparation of an Environmental Impact Statement is not required.

Date

Travis J. Rayfield
Lieutenant Colonel, Corps of Engineers
District Commander