United States Department of the Interior

FISH AND WILDLIFE SERVICE
San Francisco Bay Delta Fish and Wildlife Office
650 Capitol Mall 8th floor 8-300
Sacramento, California 95814

In Reply Refer to:
2023-0093857

Dr. Tessa Beach
Chief of Planning
U.S. Army Corps of Engineers
San Francisco District
1455 Market Street
San Francisco, California 94103-1398

Dear Sir:

Please find enclosed our Final Fish and Wildlife Coordination Act report for the U.S. Army Corps of Engineers' proposed Oakland Harbor Turning Basins Widening Project.

If you have questions on this final report, please contact Steven Schoenberg of my staff at (916) 930-5672, or at Steven_Schoenberg@fws.gov.

Sincerely,

DONALD RATCLIFF

Digitally signed by DONALD RATCLIFF
Date: 2023.11.03 09:19:49 -07'00'

Donald Ratcliff
Field Supervisor

Enclosure
cc:
Eric Jolliffe, Corps of Engineers, San Francisco, California
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Brenda Goeden, BCDC, San Francisco, California
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UNITED STATES DEPARTMENT OF THE INTERIOR

FISH AND WILDLIFE SERVICE

FINAL FISH AND WILDLIFE COORDINATION ACT REPORT FOR THE OAKLAND HARBOR TURNING BASINS WIDENING PROJECT

PREPARED BY:

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PREPARED FOR:

U.S. Army Corps of Engineers
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San Francisco, California

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SUMMARY

The Corps of Engineers' preferred alternative for the Oakland Harbor Turning Basins Widening Project would involve dredging and associated land-based excavation to widen the Inner Harbor turning basin from 1,500 to 1,965 feet and widen the Outer Harbor turning basin from 1,650 to 1,834 feet, both to -50 feet below Mean Lower Low Water. About 31.8 acres of subtidal benthos would be permanently deepened and maintained to this depth in the future. The project would greatly improve navigation efficiency and safety for increasingly large container ships that call at the Port of Oakland. All suitable material (2.17 million cubic yards) would be beneficially used for habitat restoration by placement at available permitted sites, with the remainder recycled or disposed at class I and II landfills. Beneficial re-use of dredged material for habitat restoration would offset impacts of dredging on benthic habitats. Increased navigation efficiency from the proposed project is anticipated to reduce environmental impacts from emissions due to economies of scale of large ships and reduce risks of groundings and associated release of oil or other contaminants that could otherwise harm fish and wildlife resources. Accordingly, we recommend that the project be constructed as proposed.

INTRODUCTION

This document represents the United States Fish and Wildlife Service's (Service) final Fish and Wildlife Coordination Act (FWCA) report on the U.S. Army Corps of Engineers' (Corps) Oakland Harbor Turning Basins Widening Project (project). Oakland Harbor, operated by the Port of Oakland (Port), is located just south of the Bay Bridge in the Jack London Square community of the City of Oakland, and is an active and important port of call for container ships traveling between Asia and the Americas. The authorized project, completed in 2009, has 50-foot-deep channels, with inner/outer turning basin diameters of 1,500/1,650 feet that were designed for ships no greater than an overall length (LOA) of 1,139 feet with a capacity of 6,500 twenty-foot equivalent units (TEU). The Port expects shipping volume to double from 2.5 to 5 million TEU annually. Since construction of the 50-foot deepening project, ship size and capacity of vessels calling to the Port has increased, with many more post-Panamax generation 2 and 3 vessels and a few generation 4 vessels. Nearly 60% of ships using the Port now exceed 15,000 TEU capacity, and the largest ships are longer (LOAs up to 1,300 feet) and have an even greater capacity (up to 23,000 TEU). These ships can enter the Port and be serviced by the existing cranes but are faced with significant restrictions in timing (daylight, slackwater movement only), requirements for extra tugboats and pilots, and other measures that reduce shipping efficiency and have residual environmental risks of grounding and greater emissions. The Corps' proposed project, involving widening of both inner and outer harbors, would best alleviate these restrictions and accommodate future shipping needs, as well as maximize beneficial re-use of dredged material from the project for habitat restoration.

The current 50-foot-deep channels and turning basins, as well as associated beneficial re-use for habitat restoration at sites receiving dredged material, are completed navigation improvements that are a federal project for which we issued a final FWCA report in 1999 (USFWS 1999). The Service has continued to participate intermittently after construction regarding monitoring and development at one of those re-use sites, Middle Harbor Enhancement Area. Coordination for the current turning basin widening project included participation by the Service and other State and federal resource agencies at a kickoff meeting (October 2020), a sediment quality discussion (November 2020), and a plan formulation meeting (May 2021) in which an array of preliminary alternatives was discussed. The Corps also provided the Service with a variety of other preliminary and updated information to assist in preparation of this report, including: slide decks from the coordination meetings; a memorandum on sediment disposal options, including beneficial re-use sites (Apex 2021); a memorandum on sediment suitability assumptions (Port 2021); internal draft project descriptions for an upcoming Feasibility Report/Environmental Impact Statement; figures showing work boundaries; the second draft Interim Feasibility Report/Environmental Assessment (Corps 2023), and an updated spreadsheet of updated dredged and excavated material quantities (Jolliffe 2023). Finally, we reviewed and incorporated or updated information on candidate beneficial re-use sites under consideration for this project, which were previously evaluated in FWCA reports on other recently proposed dredging projects (USFWS 2015, 2017, 2019).

We initially provided a draft FWCA report on the proposed project on November 18, 2021. Since then, the Corps revised the project with slight shifts in the proposed widening of both inner and outer turning basins, with expanded footprints, modest changes in fast land effects, and

increased dredged material quantities. Inner Harbor will also require an in-water retaining feature adjacent to Schnitzer Steel, in-water fill, and in-water pile driving not previously analyzed. On June 16, 2023, we concurred with the Corps' determination that this revised project would not be likely to adversely affect the federally endangered California least tern *(Sternula antillarum browni*) and the federally proposed as endangered San Francisco Bay-Delta Distinct Population Segment (DPS) of the longfin smelt (*Spirinchus thaleichthys*). We provided a revised draft FWCA report on August 17, 2023, reflecting this information and requested comment. This final FWCA report includes very minor changes after consideration of brief comments provided by Corps staff (Eric Jolliffe) via a September 12, 2023, email. No other comments were received.

DREDGING ALTERNATIVES

Three alternatives are under consideration, in addition to no action: widening the Inner Harbor Turning Basin (IHTB) only, widening the Outer Harbor Turning Basin (OHTB) only, and widening both Inner and Outer Harbor Turning Basins, which is the tentatively selected plan (TSP) or preferred alternative. All action alternatives would deepen the widened areas to -50 feet Mean Lower Low Water (MLLW).

IHTB widening only: The turning basin diameter would be widened from 1,500 to 1,834 feet, necessitating removal of material in water and on land within the perimeter of the new turning basin (Figure 1). Dredging in water would affect about 8.9 acres (ac) of subtidal benthic habitat, of which 7.0 ac would be actively dredged, and the remainder is a basin buffer that would be affected by the slumping of adjacent undredged areas to about a 3:1 sideslope. Landside work would vary by location. Construction at Howard Terminal would involve pavement removal, installation of new bulkhead involving driving in sheet or similar piles, installing batter piles, removal of additional material by dredging, and adding rock to protect the final slope. Work at the Alameda site would first involve building demolition, then proceed with similar work elements as with Howard Terminal. Although landside work is no longer required at Schnitzer Steel, a 300-400-foot long in-water retaining structure may be required between the northwestern portion of the turning basin footprint and the Schnitzer Steel property. The work sequence there would be driving in piles, installing batter piles, then adding rock slope protection.

For Howard Terminal and Alameda property, the landside excavation down to -5 feet MLLW would be followed by further deepening with a dredge. Staging would occur on developed areas at Howard Terminal and Alameda property. This landside work would convert about 9.9 ac of existing developed land into subtidal benthic habitat with overlying open water. Overall, this alternative would generate about 1.02 million cubic yards (mcy) of material; 0.82 mcy is estimated to be suitable for beneficial re-use in habitat restoration, including 0.45 mcy as cover and 0.37 as non-cover. The suitable material would be transported to a permitted habitat restoration site. The remaining 0.20 mcy is unsuitable for beneficial re-use and will be disposed at local Class I and II landfills. An additional 342,345 tons of construction debris from concrete, pavement, concrete piles, rock dike, or riprap, removed during widening would be recycled.

Construction would take 2 years and 4 months, beginning in July 2027. In-water work (dredging, bulkheads, etc.) would be subject to a June 1-November 30 work window. Landfill-destined material would be rehandled at a designated facility at Berth 10 (located on the east side of Outer

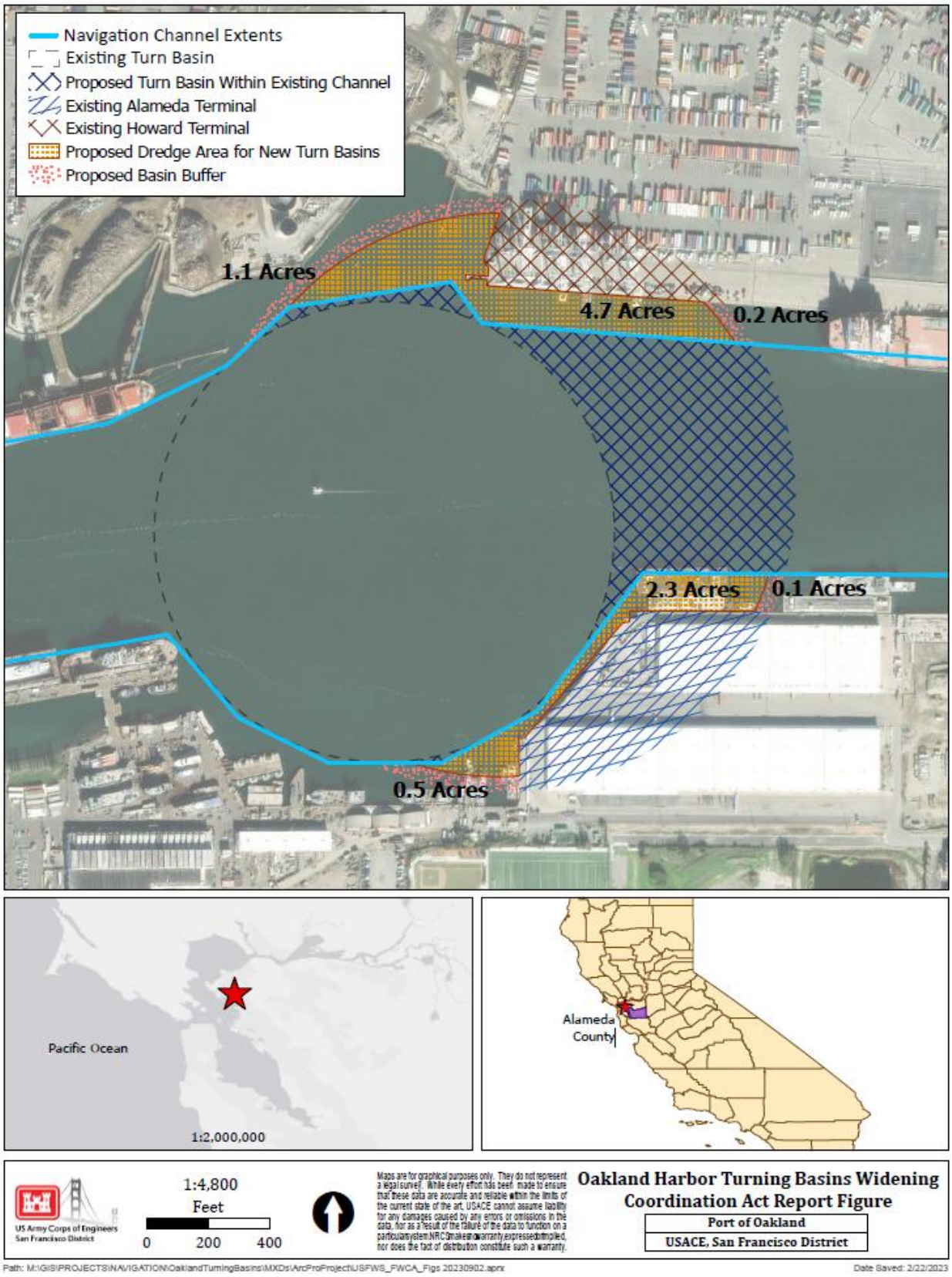

Figure 1. Inner Harbor Turning Basin widening footprint.

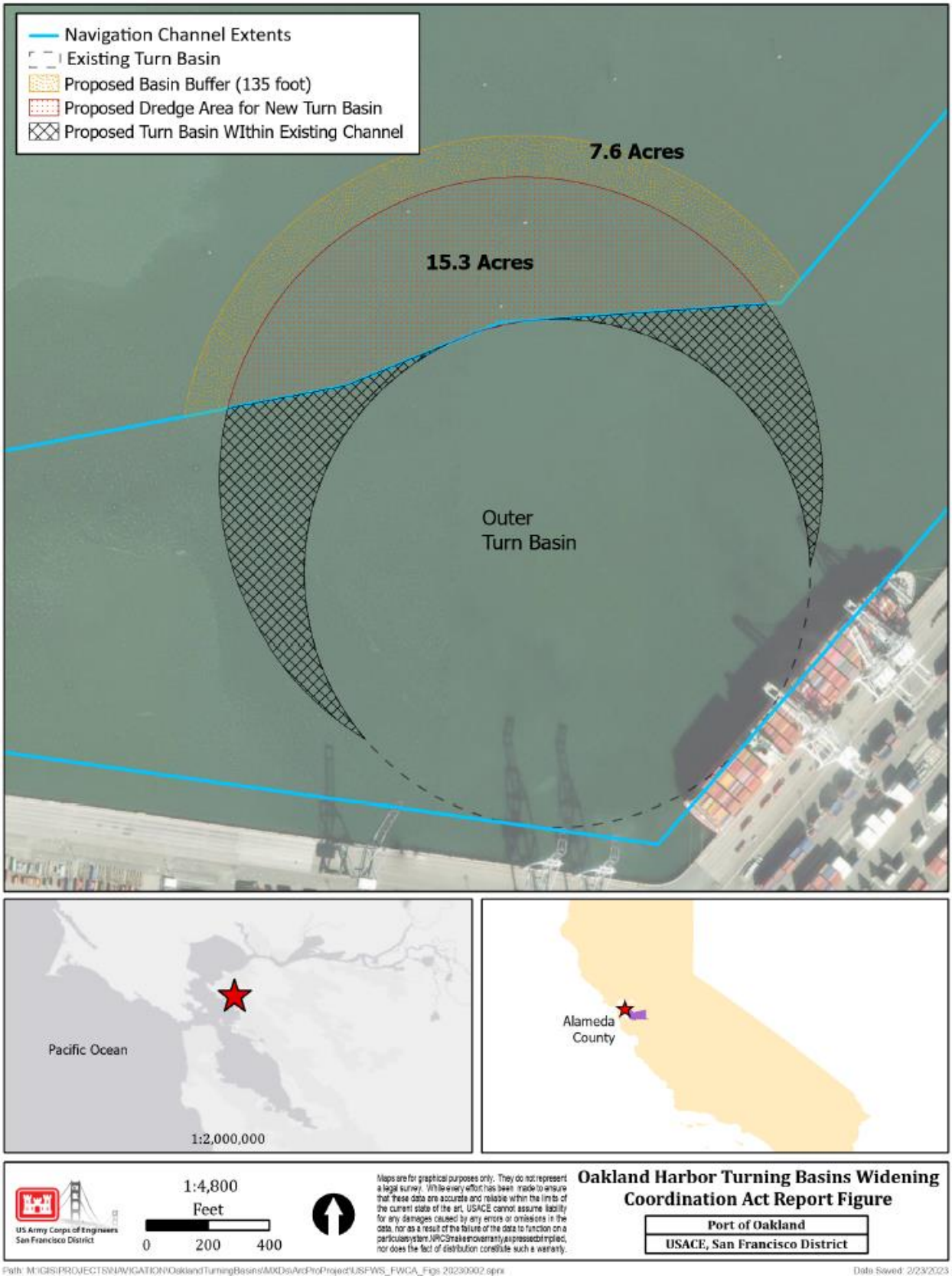

Figure 2. Outer Harbor Turning Basin widening footprint.

Harbor) and transported by truck to the landfills. The land-based work would involve heavy equipment including bulldozers, excavators, dump trucks, vibratory hammer, drilling rigs, as well as vessels such as tugboats, barges, and a dive vessel, as well as other equipment. Dredging would be accomplished by a barge-mounted clamshell excavator dredge that would place material into scows for transport to a placement site. Silt and bubble curtains would be used to limit aquatic impacts.

OHTB widening only: The turning basin diameter would be widened from 1,650 to 1,965 feet and involve in water dredging only within the perimeter of the new turning basin to a depth of -50 feet MLLW, entirely to the north of the existing turning basin and navigation channel (Figure 2). This dredging would remove 1.34 mcy of material, affecting 22.9 ac of subtidal benthic habitat, of which 15.3 ac is proposed to be dredged and 7.6 ac is a basin buffer that would be affected by the slumping of adjacent undredged areas to about a 3:1 sideslope. All the material from this alternative is assumed suitable for beneficial re-use in habitat restoration as non-cover and would be placed at a permitted site.

Construction would take 6 months of continuous work throughout the entire 2027 in-water work window (June 1 - November 30). Dredging equipment and silt curtains would be employed as described above for in-water work in the IHTB description. Staging and any sediment rehandling would occur at Berth 10.

IHTB and OHTB widening: Both turning basins would be widened in the same manner as just described for the individual basin widening alternatives. All project work would take about three seasons, beginning in July 2027 with the IHTB. OHTB work would begin in April 2028, and all work for both IHTB and OHTB is expected to be complete some time in 2029. The material amounts and placement would be the sum of the individual basins, namely, 2.36 mcy total dredged material generated, of which 2.17 mcy would be suitable for beneficial re-use for habitat restoration as cover (0.45 mcy) or non-cover (1.71 mcy) and transported to a permitted site for this purpose, and the remaining 0.20 mcy would be disposed at Class I and II landfills. Another 342,535 tons of construction debris would be recycled.

PLACEMENT OF DREDGED MATERIAL AND UPLAND SOILS

The widening project will generate both marine-derived sediments from dredging, and upland soils and other materials removed from land-based excavation. Class I material (~10,851 cubic yards, or cy) would be trucked to the nearest such landfill 203 miles away, Kettleman Hills. Class II material (~187,281 cy) would be trucked to Keller Canyon, 31 miles away. Construction debris, hard rock materials removed during the widening would be recycled (~342,535 tons). Montezuma Wetlands, one of several current and anticipated locations which could use dredged material for habitat restoration, is the only currently permitted site which accepts non-cover quality material, the predominant material expected to be generated by the proposed project (1.71 mcy). Some of the construction debris would be recycled at a quarry at Montezuma Wetlands (~129,079 tons). Cullinan Ranch is another permitted wetland restoration site that accepts cover quality material, a lesser portion of which would be generated by the proposed project (0.45 mcy). Below, we describe these permitted and other potential sites.

Montezuma Wetlands: This site is a privately owned, permitted, and operated wetland restoration project site located on about 2,400 ac of moderately subsided, diked baylands at the eastern edge of Suisun Marsh. The location is such that it would provide benefits to native fishes in the low salinity region of the San Francisco Estuary including to the federally proposed as endangered longfin smelt (*Spirinchus thaleichthys*) and the federally threatened delta smelt (*Hypomesus transpacificus*). Dredged material from various projects is transported and used here to raise elevations of the site so it can be opened to tidal action to restore tidal marshlands, and the owner charges for receipt of this material. This site can accept both wetland cover ("non-foundation") and non-cover ("foundation") quality materials. All offloading and pump facilities are currently in place and fully operational, sufficient to accept full-sized barges (~10,000 cy capacity). The site is divided into four phases, of which the first phase has been under construction since late 2003, is now filled and was breached in October 2020. Phase I received 8 mcy of dredged material and is expected to restore 600+ ac of all wetland habitat. Phase II, which is likely to be available to receive material from the proposed project when it is constructed, has an approximate capacity to receive about 4.5 mcy. When complete, phase II will yield about 400 ac of restored tidal wetland. The Montezuma Wetlands site is about 55 miles from Oakland Harbor. Material would be transported from the port by scow to an offloader at Montezuma Wetlands, which would pump the material from the barge for use on the site.

Cullinan Ranch: Cullinan Ranch is a tidal restoration project site on about 1,500 ac located on the north side of San Pablo Bay just west of the Napa River between State Highway 37 and Dutchman Slough. It is within the San Pablo Bay National Wildlife Refuge. It is currently subsided diked bayland, which was acquired with the intent to restore it to tidal marsh. Restoring the site to tidal action would have general tidal ecosystem benefits in a location that would specifically assist the recovery of the federally endangered salt marsh harvest mouse (*Reithrodontomys raviventris*) and California clapper rail (*Rallus longirostris obsoletus*). The restoration project is a permitted action with a capacity to receive at least 3 mcy of dredged material on the easternmost 290 ac of the site, which has been isolated from the rest of the site and subdivided into 5 cells for placement of material when it is available. The current plan is to complete dredged material import before opening this area to tidal action. The original 1 mcy capacity has been increased to 4 mcy to address sea level rise concerns, of which 1 mcy remains at this time. About 0.1 to 0.3 mcy per year has been recently delivered to Cullinan Ranch. Only cover quality sediment is accepted at this site. The travel distance from Oakland Harbor to Cullinan Ranch is about 35 miles. Clamshell dredged material would be barged there to a land-based offloader at Dutchman Slough and then pumped onto the site.

Other sites: Various other tidal restoration sites might accept dredged material in the amounts and timeframe for the proposed project. Eden Landing is about 12-15 miles south of Oakland Harbor on the east side of South San Francisco Bay. It is isolated by shallow water and therefore would require investment in a system to offload and transport dredged material onto the site that arrived by barge. Placement of dredged material could speed restoration of tidal marsh at this site. Bel Marin Keys is approximately 20-25 miles north of Oakland Harbor on the west side of San Pablo Bay. There has been a levee constructed there to protect an adjacent housing development from tidal waters when the site is restored and opened to tidal action, which is expected to take many years. It is planned to accept about 13.8 mcy of cover quality dredged material. An offloader is also planned, but not yet present at the site. There are also several

projects ongoing and planned in ponds in the south bay as part of the Corps' Shoreline project that need large volumes of material for levees, ecotone, or other types of fill. These sites are also a considerable distance from Oakland Harbor and isolated by shallow water, which makes transport and placement of large quantities of dredged material problematic. The Liberty offloader currently dedicated to the Montezuma Wetlands site is not used full time there and, with planning, could potentially be moved when idle to other locations that receive dredged material.

BIOLOGICAL RESOURCES

Dredging Location (see Figures 1-2): The depth range of the dredge locations in IHTB is -21 to -42 feet MLLW and maintained by annual dredging. Dredging locations north of the navigation channel for the OHTB widening are much shallower, on the order of -3 to -6 feet MLLW, and have never been previously dredged. Eelgrass (*Zostera marina*) occurs in the -3 to -9 feet MLLW depth range and small isolated patches have been recently mapped in the vicinity as near as 820 feet to the northeast of the proposed OHTB footprint (Merkel and Associates 2021). Eelgrass has been seen in modest patches around the bay, where it provides primary nursery habitat for triakid sharks, cover for juvenile fish generally, substrate for epiphytic organisms and fish spawning, and forage for wading birds. The typical benthic community of unvegetated subtidal areas in the dredging footprint would include marine worms, amphipods, mollusks, and crustaceans, both native and non-native species. The pelagic waters would have fish species, marine zooplankton dominated by calanoid copepods, and phytoplankton. Recreational species such as California halibut (*Paralichthys californicus*), sturgeon (*Acipenser spp.*), striped bass (*Morone saxatilis*), and leopard shark (*Triakis semifasciata*), are known to occur in the shallow waters of areas to be dredged. Other smaller forage species would also be expected, with shiner perch (*Cymatogaster aggregata*) and other surfperches (Embiotocidae) more abundant, as well as bay goby (*Lepidogobius lepidus*), white croaker (*Genyonemus lineatus*), speckled sanddab (*Citharichthys stigmaeus*) and, seasonally, Pacific herring (*Clupea pallasii*), which lay eggs on various natural vegetation such as eelgrass, if present, or on constructed submerged surfaces (including piers and jetties) present on bay margins and shallow waters including the turning basins.

Cullinan Ranch: This site, located on the north shore of San Pablo Bay just west of the Napa River, is a former diked bayland, subsided about 6 feet and, until recently, had been farmed for oats and hay for the last century. Sometime after it was acquired by the Service in 1991, the pumping that used to keep it in this agricultural state ceased, and it became a complex of non-tidal seasonal and perennial wetlands with some open water and a small amount of upland. This type of habitat mosaic is often used by wading birds. In 2015, most of the site was opened to tidal action, and the area is now primarily open water. Contemporary surveys show the open-water habitats are used by many species of waterfowl during fall and spring migration periods, particularly dabbling and diving ducks (Washburn 2018). However, the 280 ac of the site reserved for dredged material placement remain as a combination of fallow fields (unfilled cells), and low-value habitat areas currently being disturbed by material placement (filled cells).

Montezuma Wetlands: This site is diked, subsided up to 11 feet, and was formerly characterized as grazing land with some bare areas and wetlands in the form of ditches, saline basins, and

seasonally flooded areas (Levine-Fricke 1995). Phase I of the Montezuma Wetlands project has reached its capacity of 9 mcy of fill material and was recently breached in October 2020. Phase I is currently being used by fish and wildlife as it develops marsh vegetation. The status of the rest of the site not yet under active restoration is presumed to remain as predominantly upland vegetation. Within these uplands, seasonally flooded areas probably receive some winter use by wading birds and waterfowl during periods of high precipitation and extreme tides, and the site supports significant use by California least tern and tule elk. Otherwise, the primary wildlife use of the area is dominated by common upland species.

Special status species: A special status species refers to any species which is listed, proposed to be listed, or a candidate for listing under the state or federal Endangered Species Act. There are a variety of listed species that could occur within the action area of the proposed project, but some are more likely in the disposal alternatives that are not part of the TSP. Threatened green sturgeon (*Acipenser medirostris*), threatened steelhead trout (*Oncorhynchus mykiss*), endangered spring- and winter-run Chinook salmon (*Oncorhynchus tshawytscha*), and proposed for listing longfin smelt can occur in open waters throughout the bay, which includes Oakland Harbor. The threatened delta smelt, endangered salt marsh harvest mouse, and endangered California least tern (*Sterna antillarum browni*), have been confirmed to be present at Montezuma Wetlands.

HABITAT TYPES AND EVALUATION SPECIES

In May 2023, the Service released the final version of our Mitigation Policy (Appendix 1, 501 FW 2)(MP) (Federal Register docket number FWS-HQ-ES-2021). The MP provides guidance in the form of general principles such as preference to avoid high-value habitats, an overall goal of no net loss, use of a landscape context, and other factors that should be considered in the evaluation and assessment of mitigation. It retains the evaluation species concept, but no longer employs the use of Resource Categories with varying mitigation goals as was the case in the 1981 MP. The current MP differentiates between high and low value habitats. For high value habitats, avoidance and minimization should be applied before compensation. For lower value habitats, compensation may be applied when deemed to more effectively and efficiently mitigate impacts.

We have designated seven basic cover-types within the project area and adjacent areas affected by the project. Due to differences in water depth and/or salinity in tidal and non-tidal ponds, there may be several more specific habitats within these cover-types, as noted below.

Open water (bay): This cover type is considered those waters within San Francisco Bay which are permanently inundated, deeper than MLLW and usually more than -18 feet MLLW, although the proposed new dredging footprint has depths -4 to -23 feet MLLW. Areas affected by the project include the portions of the enlarged turning basin footprints that require dredging, adjacent waters affected by turbidity, and any sediment offloading facilities constructed in deep waters. Pelagic plankton, fish, and macroinvertebrates reside in these waters and are prey organisms for larger recreational fish, and some seabirds and waterfowl. An appropriate evaluation species would be juvenile fishes. Such open waters are relatively abundant in the planning area and are not expected to be lost or permanently degraded by the proposed action.

Subtidal benthic (bay): This cover type includes permanently inundated, unvegetated bottom substrate deeper than MLLW, such as the channels to be dredged, and the footprint of any new sediment offloading facilities constructed in deep waters. This cover type supports food organisms like shrimp, benthic fish, and other macroinvertebrates. Bottom dwelling fishes such as sturgeon, flatfishes such as juvenile halibut, and rays, would be appropriate evaluation species. The subtidal benthic habitat affected by the proposed project is either not previously dredged (OHTB) or, as with IHTB, previously dredged but not maintained navigation channel. Some additional subtidal benthic habitat will be created by excavation of fast lands in Inner Harbor. The shallower undredged areas likely support a greater diversity and productivity of benthic organisms than dredged areas. This cover type is relatively abundant, but a longer lasting effect will result from project construction and maintenance than for open waters.

Non-tidal pond waters: This cover-type includes permanently inundated, unvegetated waters separated from tidal action, and is represented by any ponds within Montezuma Wetlands or Cullinan Ranch which could receive dredged material from the proposed project. These ponds vary in depth, circulation, and water chemistry depending on management. They support some species of saltwater or freshwater fish, and benthic or pelagic macroinvertebrates that can provide forage. They may be used by waterfowl, or other bird groups, depending on salinity. For the lower salinity ponds, we would select a duck such as the northern shoveler as an evaluation species. For higher salinities, the American avocet would be an appropriate evaluation species. Non-tidal ponds are moderately abundant and are used for foraging and roosting by the evaluation species.

Tidal emergent marsh: This cover-type includes areas which are vegetated, generally between Mean Higher High and Mean Low Water that are subject to unrestricted tidal inundation and drained by slightly deeper, unvegetated channels. For this project, it includes areas which could become vegetated in the future through placement of dredged material and exposure to tidal action at Montezuma Wetlands or Cullinan Ranch, as well as vegetated margins of sloughs which may be affected locally by offloading facilities and pipes needed to transport dredged material. Species composition varies with salinity and elevation with respect to mean tide level. Tidal marshes provide habitat for mammals including the salt marsh harvest mouse, tidal marsh birds such as California clapper rail, macroinvertebrates, and juvenile fishes. Tidal marshes also produce and export organic matter that supports the food web. Evaluation species would be a marsh specialist like the marsh wren. The unvegetated tidal channel component of tidal marsh is an important breeding and nursery area for some fishes, and foraging area for shorebirds. Most historical tidal marsh in the Bay area has been lost due to industrial salt production or coastal development and fill. However, the restoration of tidal marshes in the past 20 years is beginning to increase this habitat type.

Mudflat: Mudflats are unvegetated tidal areas between Mean Low Water and MLLW that are exposed during low tide. A limited amount of mudflat could be locally disturbed at least temporarily by construction and operation of an offloader and/or pipeline needed to deliver sediment to Cullinan Ranch. Depending on initial elevation and subsequent revegetation rate, some expanses of mudflat could form initially at either Cullinan Ranch or Montezuma Wetlands. Mudflats produce diatoms, worms, and shellfish, which provide forage for numerous shorebirds, gulls, terns, and larger wading birds. During higher tide stages, fish enter the mudflats to forage.

Shorebird species which specialize on exposed mud such as the western sandpiper would be an appropriate evaluation species. Although there has been some loss of mudflat due to development and fill, it remains moderately abundant in the Bay.

Seasonal Wetland: Seasonal wetlands include low areas of Cullinan Ranch or Montezuma Wetlands that regularly pond during the winter. The more open wetlands can support vernal pool crustaceans, while the vegetated areas include some pickleweed and salt grass known to support the salt marsh harvest mouse. For the lower salinity ponds expected in these locations, we would select a duck such as the northern shoveler as an evaluation species. This particular cover-type is largely a consequence of historical diking and is of low-to-moderate abundance and value to the evaluation species. Restoration actions would result in eventual replacement of ponded areas with tidal emergent marsh in areas where it is considered of greater value.

Upland: Upland in the project area occurs mostly as non-native annual grassland habitat on dike slopes surrounding the Montezuma Wetlands placement site. Limited portions could be temporarily affected by construction of offloading facilities or pipelines needed to deliver dredged material. Larger areas of upland on Montezuma Wetlands would be disturbed, then later restored to tidal wetlands. Upland supports common small mammals and passerine birds, some of which are non-native. The uplands at Montezuma Wetlands also contain some seasonal wetlands, where California least tern has been documented foraging since 2005. A native species like the California vole would be an appropriate evaluation species. A modest area of upland adjacent to tidal emergent marsh has value as roosting habitat for birds during high tides, and as refugium for the listed salt marsh harvest mouse during tidal flood events.

FUTURE WITHOUT THE PROJECT

Without the project, the shallower depths of the footprints of the turning basin would remain more or less as current. No significant net shoaling or erosion is anticipated in the currently shallow OHTB dredge locations. Maintenance dredging would continue in the IHTB dredge locations by local authorities, to maintain them at the current depths. Shipping would continue with mostly smaller ships, and an increasing number of larger ones, that would be subject to restrictions and delays. This will result in increased emissions and increased risk of groundings with potential environmental risks such as oil spills and damage to natural resources.

Beneficial re-use sites that accept dredge material for wetland restoration would continue to receive dredged materials when available from projects other than the proposed project, however, the time of completion of sites or phases of sites would be slightly longer without the project, resulting in modestly lower habitat value benefits (see Discussion and Appendix A). However, the effect on completion time would not change the area restored or habitat quality at maturity. Both with and without project futures would have the same coincident benefits of providing habitat that can resist sea level rise, because this effect is experienced late in the project life long after site capacity has been reached in either scenario.

FUTURE WITH THE PROJECT

With the project, there would be an initial disturbance from project construction over the 2+ year construction period, followed by a modest incremental increase in annual maintenance dredging quantity on the order of 22,800 cy, commensurate with the increase in area to be maintained owing to the enlarged turning basins. There are a variety of ways that biotic resources may be adversely affected by these dredging disturbances and the associated increase in turbidity when sediments are removed and placed in a scow. These mechanisms include temporary reduction in visibility, clogging of gills, burial of sessile invertebrates, reduced foraging, removal of forage organisms in the substrate, displacement of mobile organisms such as fish and marine mammals to other locations, and a possibility of direct mortality through mechanical injury. The dredging activity would cause a somewhat more continuous, but localized disturbance of the benthic biotic community in the immediate vicinity of the dredging operations. This could result in a temporary reduction in abundance of benthic organisms that lasts on the order of several months. The effects on fish would likely be limited to displacement during operations although there may be some adverse effect on fish exposed to turbidity plumes in the immediate vicinity of the dredge.

There would be some level of permanent effect where shallower subtidal is dredged and maintained much deeper (15.3 acres in outer harbor, Figure 2), by virtue of regular disturbance from ship traffic and maintenance dredging and, possibly, an increment of lower benthic productivity associated with the increased depth. With the project complete, shipping volume would increase, but the ships would be larger and fewer than without the project. Shipping efficiency would increase, reducing emissions and the risk of groundings and associated environmental damage. Although portions of the widened outer harbor turning basin are slightly closer to the nearest eelgrass patch than the existing basin (reduced from ~1,000 feet to ~820 feet), other parts of the ship channel which will experience continued maintenance dredging are much closer to this patch (as close as 200 feet). We believe it is highly unlikely that the new, more distant, dredging will affect eelgrass north of the outer turning basin. In any case, we expect and recommend the Corps to monitor the eelgrass post-project to determine if there is any change relative to reference areas.

Construction of the project within the June 1 - November 30 dredging window is intended to avoid and minimize impacts to listed salmon, steelhead, and sturgeon. It may help minimize impacts to longfin smelt as well. Any other necessary measures would be determined through formal consultation with National Marine Fisheries Service and U.S. Fish and Wildlife Service, if appropriate.

Depending on cost, dredged material characteristics, and placement site availability, both project construction and subsequent project maintenance would generate dredged material that would be placed at permitted tidal wetland restoration sites. The quality of the material, and availability of sites to accept material at the time of dredging will influence the placement location choice.

Cullinan Ranch: Placing the estimated 0.45 mcy volume of cover quality dredged material here would modestly accelerate completion of the site in terms of dredged material needs by about one season, based on the current rate of receipt of dredged material (0.1-0.3 mcy annually). This site is located and designed to specifically benefit the salt marsh harvest mouse in the near term.

Revegetation would likely begin immediately after breaching, and 5-6 seasons of tidal action is expected to provide the veneer of natural sediment needed to optimize high marsh establishment. About 90% of the site is designed for high marsh that would benefit the federally listed salt marsh harvest mouse and California clapper rail as well as other high marsh wildlife species. The other 10% of the area would be channels and low marsh providing habitat for marsh-affiliated fish and fish-eating wildlife. The current plan for Cullinan Ranch is to convert existing upland and seasonal wetland habitat in sites receiving dredge material to tidal marsh and channels. Wading birds may be displaced, however, the current value of the site is likely to be limited owing to recent earthwork in preparation of receipt of dredged material from other projects. Any displaced wading birds would likely relocate to nearby habitat west of the receiving site.

Montezuma Wetlands: Placement of the estimated 1.71 mcy volume of dredged material here would substantially contribute to the 4.5 mcy total needed to complete phase II of this project. Phase II construction has just started, and sediment made available by the Oakland turning basin project could accelerate completion of Montezuma Wetlands by 2 years or more. This restoration site is anticipated to have relatively broad benefits, including to marsh wildlife such as salt marsh harvest mice, and native fish including delta smelt.

DISCUSSION

For the purposes of this report, we have limited our discussion to the no-project and Corps-preferred TSP of widening both Inner and Outer turning basins with disposal of all suitable material at beneficial re-use sites, and disposal of limited amounts at Class I and II landfills. Widening the turning basins will result in greater efficiency of shipping, with fewer, larger ships, and increased navigation safety, lessening the risk of future groundings, chemical spills, and consequent effects on fish and wildlife resources. The extent of disturbance to benthic habitats needed to widen the turning basins is 15.3 ac of previously undredged, shallower subtidal benthic habitat for OHTB widening and 7.0 ac of previously dredged portions of Inner Harbor. About 9.9 ac of new open water and subtidal benthic habitat will be created during IHTB widening by upland excavation.

Evaluation of the suitability of dredged material for use at the alternative placement sites, at this time, has been approximated based on location and depth (Port 2021). There has been testing for other project and maintenance activities that supports this evaluation, and additional testing is planned prior to the proposed project. In general, young bay mud is deemed acceptable as wetland non-cover, and material at and below contact with old bay mud or Merritt sand is suitable for any re-use. But there are significant exceptions assumed for the upper 15 feet of materials on fast lands (Howard and Alameda) as well as in water in the basin area between Schnitzer and Howard Terminal that are all expected to require Class I or II landfill disposal. We support the plan to conduct further testing to verify these estimated quantities. We also recommend that the future increased increment of dredged material derived from maintenance of this project be considered for beneficial re-use in tidal restorations to the maximum extent practicable, and to the extent deemed suitable, such as at Eden Landing, Cullinan Ranch, Montezuma Wetlands, Alviso Ponds, or other re-use sites.

The placement sites have not yet been formally designated, but for purposes of illustration we will assume non-cover would be placed at Montezuma Wetlands (the only currently permitted site that accepts non-cover) and cover would be placed at Cullinan Ranch. If placement of the dredged material from the project is able to be delivered to these permitted restoration sites it will contribute to meeting their habitat benefit goals faster than anticipated. Prior testing done in the 1990s for the 50-foot deepening project and later testing for maintenance dredging suggests that most of the turning basin dredged material will at least meet state criteria for use as non-cover (foundation) material in wetland restoration and a modest amount will be suitable as cover in wetland restoration. The quantity of this benefit can be expressed in several ways - the benefit associated with the dredged material volume from the project as a fraction of the total volume needed for restoration, or the benefit associated with the acceleration of the restoration expressed as habitat value. These benefits were estimated using simplified Habitat Evaluation Procedures calculations (Appendix A).

The availability of the proposed project sediments is expected to accelerate completion of Cullinan Ranch and Montezuma Wetlands phase II modestly, which will result in a greater average habitat value over the period of analysis. Over the 52-year period of analysis (2 years construction, 50-year project life), we roughly estimate the effect of accelerated completion to be one year at Cullinan Ranch, resulting in an increase in habitat value of about 5.4 Average Annualized Habitat Units (AAHUs) (Appendix A). The likely volume intended for disposal at Montezuma Wetlands is more significant, about 1.71 mcy, and the effect of accelerating completion of phase II there is estimated to increase habitat value by 17.9 AAHUs. This benefit would increase slightly if all 2.17 mcy of material went to Montezuma Wetlands.

If all the estimated 1.71 mcy of non-cover quality material were placed at Montezuma Wetlands phase II, and the estimated 0.45 mcy of cover quality material were placed at Cullinan Ranch, the restored tidal areas attributable to these volumes is estimated total 192.6 ac, and the associated habitat value would total 169.4 AAHUs (Appendix A). Similar quantitative benefits would accrue if all 2.17 mcy were placed at Montezuma Wetlands (204.5 ac, 179.5 AAHUs). This habitat area and value benefit is greater than that lost in the 31.8 ac of subtidal habitat degraded due to dredging and subsequent maintenance. Although restored tidal wetland is not the same kind of habitat as the subtidal benthic which is to be impacted, the benefit associated with the project achieves our MP goal of no net loss. We also believe that habitat creation in these placement sites (Cullinan Ranch and Montezuma Wetlands) or other similar restorations has value to the San Francisco Estuary ecoregion. This finding is based on our best judgement of a comparison of the gains and losses, the range of species affected, and information on the likelihood of benefit. In its ranking of 40 sites based on a variety of likely benefits, the Corps ranked Montezuma Wetlands #1 and Cullinan Ranch #10, with Montezuma Wetlands highest based on the benefits to listed species, particularly fishes, in the low-salinity zone (formerly, entrapment zone; Corps 2011). Cullinan Ranch will likely have the most benefits to listed marsh wildlife species not specifically recognized in Corps (2011). Further benefits are expected from the production and export of vascular plant material and attached algae from restored marsh to bay waters, which we expect to enhance fishery resources over a broader area.

CONCLUSION

The proposed Oakland Harbor Turning Basins Widening Project will have localized temporary effects on fish and wildlife resources in and near the open bay water and subtidal benthic habitat of the dredging footprint and some permanent effects as a result of deepening subtidal benthic habitat. The project is necessary to accommodate current and future ship size and traffic, improve shipping efficiency, and reduce the risk of ship groundings which could otherwise damage resources. Placement of material at permitted wetland restoration sites will contribute to their completion and provide habitat for multiple species, including listed species of interest, mitigating for the impacts of the dredging on more abundant benthic habitat that is less important to fish and wildlife of highest concern. Accordingly, we recommend the Corps implement the preferred alternative of deepening both inner and outer harbor turning basins as proposed and consider future use of maintenance-generated dredged material for beneficial re-use.

RECOMMENDATIONS

We recommend that the Corps:

1. Implement the project as proposed (deepening both inner and outer harbor turning basins; maximize beneficial re-use by placement at permitted tidal marsh restoration sites);

2. Conduct sediment testing to confirm estimated quantities suitable for wetland restoration and landfill disposal;

3. Maximize beneficial use future maintenance dredged material for tidal marsh restoration at available permitted sites; and

4. Conduct eelgrass surveys no earlier than 1 year prior to construction in the vicinity of the proposed project and reference areas, and again within 1 year after construction is complete, to confirm that the effect on this habitat is insignificant.

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APPENDIX A. Worksheet showing calculation of benefit of restoration actions at Cullinan Ranch or Montezuma Wetlands phase II and proportion of total benefit (area and habitat value) associated with material from the Oakland Harbor turning basin project

1. This part is a test calculation of benefits of habitat restoration acceleration due to availability of cover quality dredged material from the Oakland Harbor turning basin project at Cullinan Ranch

Scenario: this calculates benefits of placing 0.45 mcy dredged material from the turning basins, accelerates completion of Cullinan Ranch by 1 year
This is a rough calculation given the uncertainty about the capacity of Cullinan, which has been increased from 1 mcy to 4 mcy

TY	0	1	2	3	4	9	10	52	notes:
HSIw/o	0	0	0	0	0.1	0.8	1	1	year 4 breach, maximum value in year 10
HSI w/	0	0	0	0.1	0.2	1	1	1	year 3 breach Oakland material accelerates by 1 year
area w/o	280	280	280	280	280	280	280	280	reaches maximum value in year 9
area w/	280	280	280	280	280	280	280	280	
HUs w/o		0	0	0	14	630	252	11760	
HUs w/		0	0	14	42	840	280	11760	
AAHUs without								243.4	
AAHUs with								248.8	
change due to project								5.4	This value represents the benefit of turning basin material placement accelerating Cullinan Ranch completion by 1 year

Assumptions:
It takes 6 years after breaching to reach full tidal value, which assumes rapid revegetation due to filling near vegetation threshold elevation.
The restoration project has limited value the first year after breaching
The 0.45 mcy of material going from the turning basins to Cullinan Ranch would take 1 year to obtain from other sources without the turning basin project.
It would take 2 seasons to complete the turning basin dredging

2. This part is a test calculation of benefits of habitat restoration acceleration due to availability of dredged material
from the Oakland turning basin project at Montezuma Wetlands
Scenario: this calculates benefits of placing 1.71 mcy dredged material from turning basins at Montezuma Wetlands, accelerates completion by 2 years
This is based on the recent (2012-2017) fill rate of that site; of 3.376 mcy over the last 6 years, or about 0.56 mcy/year (Acta 2018).
With .56 mcy/yr, it would take about 8 years from start (2022-2023) to fill phase II of that site and breach it.
At the time of dredging of the turning basins beginning 2027, Montezuma phase II is assumed to be half full.
Assume that if the turning basin material were to go to Montezuma, it would be completed in 2 fewer years (TY2), than without that material.

TY	0	1	2	3	4	12	14	52	notes:
HSIw/o	0	0	0	0	0.1	0.8	1	1	this scenario finishes Montezuma ph II in TY4, reaches max value by TY14
HSI w/	0	0	0.1	0.2	0.3	1	1	1	this scenario finishes Montezuma ph II in TY2, completed 2 yrs sooner with turning basin material
area w/o	424	424	424	424	424	424	424	424	
area w/	424	424	424	424	424	424	424	424	
HUs w/o		0	0	0	21.2	1526	763.2	16112	
HUs w/		0	21.2	63.6	106	2205	848	16112	
AAHUs without								354.3	
AAHUs with								372.2	
change due to project								17.9	

Assumptions:
It takes 10 years after breaching to reach full tidal habitat value, slower than at Cullinan Ranch due to larger unit size, and not filling as close to vegetative threshold elevation.
The breached phase II has limited value the first year after breaching.
The availability of the 1.71 mcy of material going from the turning basins to Montezuma would take 2 more years to obtain from other sources if no Oakland project produced material were available.

3. This part estimates the restoration benefit, in area or value, associated with the volume of material coming from the turning basins as a fraction of the total benefit for disposal at Cullinan Ranch (CR) and Montezuma Wetlands (MZ)
Note: sediment volumes preliminary, not precisely known, actual dredged volume may vary
Note: assumes total placement volumes of 4 mcy (Cullinan Ranch) and 4.5 mcy (Montezuma ph II)
a) Proportion of restored AREA benefits under potential scenarios due to turning basin material:
Scenario: 0.24 mcy to CR, 1.71 mcy to MZ or scenario: 1.95 mcy to MZ only

volume assumed:	0.45 mcy	1.71 mcy	2.17 mcy	
	CR	MZ	MZ	
				note: calculated as turning basin volume/total placement site volume
associated restored	31.5	161.1	204.5	* total placement site area
ac:	31.5 + 161.1 = 192.6			

b) Proportion of HABITAT VALUE benefits for turning basin sediments to restoration sites under potential scenarios:
Scenario: 0.45 mcy to CR, 1.71 mcy to MZ or scenario: 2.17 mcy to MZ only

	AAHUs	AAHUs	AAHUs
	As proposed, both		All to
	CR	MZ	MZ
estimated volume:	0.45	1.71	2.17
associated habitat	28.0	141.4	179.5
value, AAHUs:	28.0 + 141.4 = 169.4		

ACRONYMS:
AAHUs - Average Annualized Habitat Units
CR - Cullinan Ranch
HSI - Habitat Suitability Index
HU - Habitat Units
mcy - million cubic yards
MZ - Montezuma Wetlands
TY - Target Year