



UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
West Coast Region
777 Sonoma Avenue, Room 325
Santa Rosa, California 95404-4731

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Refer to NMFS No: WCR 2018-10641

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Re: Endangered Species Act Section 7(a)(2) Concurrence Letter and Magnuson-Stevens Fishery Conservation and Management Act Essential Fish Habitat Response for the U.S. Army Corps of Engineers 2018 NLAA Program (SPN 2013-00187 and SPK-2013-00451)

Dear Dr. Bottoms and Mr. Jewell:

On August 24, 2018 and September 5, 2018, NOAA's National Marine Fisheries Service (NMFS) received your requests for a written concurrence that the U.S. Army Corps of Engineers (USACE) 2018 NLAA Program under the authority of the Clean Water and Rivers and Harbors Acts 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 you 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. In this case, NMFS concluded that while the action would adversely affect EFH, adverse effects are so minimal that we have no EFH Conservation Recommendations to provide.

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 NMFS' Public Consultation Tracking System (PCTS) (<https://pcts.nmfa.noaa.gov/pcts-web/homepage.pcts>).¹ A complete record of this consultation is on file at NMFS' California Coastal Office, Santa Rosa, California.

Proposed Action and Action Area

The USACE's 2018 NLAA Program will cover certain actions the USACE permits in their San Francisco and Sacramento Districts' Regulatory branches in California. The 2018 NLAA Program will cover projects in Pacific coastal waters (mean high tide to 3 miles offshore) from the Oregon border to the San Luis Obispo County Line, and on-shore in: 1) all coastal land areas from the Oregon border to the San Luis Obispo County Line that drain to the Pacific Ocean, including the Salinas River watershed (which extends south of the San Luis Obispo County Line), and 2) interior California watersheds that drain to the Sacramento and San Joaquin rivers, the mainstem Sacramento and San Joaquin rivers, the Sacramento-San Joaquin Delta, and lower mainstem Sacramento River to Chipps Island.

USACE's 2018 NLAA Program, procedures, and project criteria are described in detail in the attachments to your August 24 and September 5, 2018, letters, and minor modifications to procedures and project criteria confirmed by emails between NMFS and USACE. The 2018 NLAA Program includes, with certain limitations and restrictions, the following seven project types: 1) boat docks, piers, wharfs and overwater decks; 2) bridge repairs, widening, replacement, or removal; 3) culvert repair, replacement, upgrades, or removal; 4) buoys, floats and other devices to facilitate vessel mooring; 5) pipeline repair or replacement; 6) geotechnical boring in support of project designs; and 7) aids to navigation in bays, estuaries, and river mouths. The project criteria developed for the 2018 NLAA Program include time and area restrictions, specific methods and materials, and special notification requirements. For example, some projects such as bridge repairs, widening, or replacement; culvert replacement or upgrades; and pipeline repairs or replacement, may occur only when streams or rivers are naturally dry.

Area restrictions are described in the text or shown on the maps attached to your letters. Specific measures to avoid impacts on listed species and critical habitats were described in the materials USACE provided with their concurrence request and EFH consultation request and are described below as appropriate. Since receiving your concurrence requests, we have worked with your staff to further clarify some of the project criteria. These clarifications have been documented by emails.

The 2018 NLAA Program also includes procedures to ensure compliance with criteria specific to species and projects, and to maintain coordination between USACE and NMFS to ensure efficacy of the 2018 NLAA Program. For each project covered under the NLAA Program, permit applicants are required to report specific information to USACE, including how the project will meet the required criteria. Projects with interrelated and/or interdependent actions that may affect a listed species or critical habitat will not be included by USACE in the 2018 NLAA Program. In addition, USACE will provide NMFS project-specific information prior to USACE permitting to ensure that the project is eligible for inclusion the 2018 NLAA Program. In cases where NMFS disagrees that the

¹ Once on the PCTS homepage, use the following PCTS tracking number within the Quick Search column: WCR-2018-10641.

proposed project qualifies for inclusion in the 2018 NLAA Program, or NMFS requires more information, NMFS will inform USACE within two weeks (14 days) of project notification from USACE.

NMFS and USACE will meet annually, and as needed, to: 1) evaluate and discuss the continued effectiveness of the 2018 NLAA Program's project criteria and procedures (including compliance with reporting requirements) for ensuring listed species and critical habitat are not likely to be adversely affected from projects permitted by USACE, and 2) to update procedures, criteria, and maps, if necessary. At or before the annual meeting, USACE will provide a table identifying project information as described in the enclosures included with USACE's August 24 and September 5 letters describing the 2018 NLAA Program, and USACE's reasoning for their determination of effects.

USACE's authorization and NMFS' concurrence for the 2018 NLAA Program can end at any time if: 1) USACE elects to end the NLAA Program, 2) NMFS withdraws concurrence if NMFS determines that the 2018 NLAA Program is not being implemented as intended, 3) USACE fails to provide annual reports or notifications, or 4) reinitiation of consultation is required pursuant to 50 CFR 402.16. As needed, NMFS and USACE will provide training to USACE staff on determining the effects of project on listed species and critical habitat, and the use of the 2018 NLAA Program for USACE permitted projects in California.

Action Area

The area where projects may occur under the USACE 2018 Program includes marine, estuarine, and riverine areas within and offshore of the State of California, including the Northern California Coast, the Central California Coast, San Francisco Bay, and the Central Valley. Boundaries for these geographic areas are as follows:

Northern California coast: Oregon border south to the Humboldt-Mendocino County line; inland watersheds that drain to the Pacific Ocean.

Central California coast: Humboldt-Mendocino County line south to Monterey-San Luis Obispo County line and includes San Francisco Bay eastward to Chippis Island. The Central California Coast includes inland watersheds that drain to the Pacific Ocean (except for the Sacramento and San Joaquin Rivers) and the entire Salinas River watershed.

San Francisco Bay: The eastern most extent of San Francisco Bay corresponds with the USACE San Francisco District's regulatory jurisdiction (ends at Chippis Island) and includes the central and south bays, San Pablo Bay, the Carquinez Strait, Grizzly Bay, and Susiun Bay. River mouths within the Bay (except for the Sacramento-San Joaquin Delta) are included up to the extent of tidal influence (*i.e.*, contains at least some salt or brackish water at some times). The western extent of the Bay ends at the Golden Gate Bridge.

Humboldt Bay: Humboldt Bay includes three geographic segments: South Bay, Central Bay (or Entrance Bay), and North Bay (or Arcata Bay). River and creek mouths within the Bay are included up to the extent of tidal influence (*i.e.*, contains at least some salt or brackish water at some times). The western extent of the Bay ends at the western extent of the entrance channel.

Coastal marine areas: Areas outside of estuaries or bays along the California coast from mean high tide to 3 miles offshore from the Oregon border to the Monterey-San Luis Obispo County line.

Delta: The Sacramento-San Joaquin Delta as defined by the California Water Code, Section 12220.

Action Agency's Effects Determination

USACE is requesting concurrence that the 2018 NLAA Program is not likely to adversely affect the following ESA listed (Evolutionarily Significant Unit, ESU, or Distinct Population Segment, DPS) fish, sea turtles, marine mammals and critical habitats, under NMFS' jurisdiction (Table 1). Critical habitat has not been designated for all of these species, and for some species designated critical habitat does not occur in the action area. Species with designated critical habitat that is included in the USACE's programmatic determination of not likely to adversely affect have an asterisk (*) in the following table:

Table 1: listed species and critical habitat included in USACE's programmatic determination

<i>Name</i>	<i>ESU or DPS if applicable</i>	<i>Federal Status</i>
<u>FISH</u>		
Chinook Salmon (<i>Oncorhynchus tshawytscha</i>)	Sacramento River winter-run ESU* Central Valley Spring-run ESU* California Coastal ESU*	Endangered Threatened Threatened
Coho Salmon (<i>O. kisutch</i>)	Central California Coast ESU* Oregon/N. CA Coast ESU*	Endangered Threatened
Steelhead (<i>O. mykiss</i>)	Southern California DPS* South-Central California DPS* Central California Coast DPS* California Central Valley DPS* Northern California DPS*	Endangered Threatened Threatened Threatened Threatened
Green Sturgeon (<i>Acipenser medirostris</i>)	Southern DPS*	Threatened
<u>SEA TURTLES</u>		
Leatherback sea turtles (<i>Dermochelys coriacea</i>)*		Endangered
<u>MARINE MAMMALS</u>		
Blue whale (<i>Balaenoptera musculus</i>)		Endangered
Fin whale (<i>Balaenoptera physalus</i>)		Endangered
Humpback whale (<i>Megaptera novaeangliae</i>)	Central American DPS Mexico DPS	Endangered Threatened
Sei whale (<i>Balaenoptera borealis</i>)		Endangered
Sperm whale (<i>Physeter macrocephalus</i>)		Endangered
Western North Pacific gray whale (<i>Eschrichtius robustus</i>)		Endangered
Killer whales (<i>Orcinus orca</i>)	Southern resident DPS	Endangered
North Pacific right whale (<i>Eubalaenajaponica</i>)		Endangered
Guadalupe fur seal (<i>Arctocephalus townsendi</i>)		Threatened

USACE made their determination of not likely to adversely affect based on the numerous general and project specific criteria included in the NLAA 2018 Program. These criteria were developed in collaboration with NMFS and are intended to reduce any potential effects from projects conducted under the program to insignificant or discountable levels.

The life history of these listed salmonids for which USACE is seeking concurrence is reviewed in Weitkamp *et al.* (1995), Busby *et al.* (1996), and Myers *et al.* (1998). Green sturgeon life history is described by Adams *et al.* (2002). Marine mammal life histories and status are summarized in Barlow *et al.* (2011), Calarnbokidis *et al.* (2009), Carretta *et al.* (2011), NMFS (1991, 2008, 2010a-

b, 2011a, 2012a-b), Perry *et al.* (1999), <https://www.fisheries.noaa.gov/species/gray-whale> (accessed 6-5-2018). Leatherback sea turtle life history is described by Van Buskirk and Crowder (1994), Spotila and Tomillo (2015), and <https://www.fisheries.noaa.gov/species/leatherback-turtle> (accessed 6-5-2018).

Critical habitats included in the USACE's programmatic determination for the 2018 NLAA Program, and their primary constituent elements and/or essential features, are described in 58 FR 33212 (June 16, 1993), 64 FR 24049 (May 5, 1999), 70 FR 52488 (September 2, 2005), and 74 FR 52300 (October 9, 2009).

USACE also made a determination that the 2018 NLAA program would only result in minimal or minor adverse effects EFH protected under the MSA. This determination was based on the program criteria which are intended to reduce or eliminate adverse impacts to EFH. The following EFH for various federally managed fish species (and Habitat Areas of Particular Concern - HAPCs) occurs in the project area:

Pacific Coast Groundfish (estuaries, seagrass, rocky reefs, canopy kelp);
Pacific Coast Salmon (estuaries, marine and estuarine submerged aquatic vegetation, complex channels and floodplain habitats, thermal refugia, spawning habitat);
Coastal Pelagic Species (no HAPC);
Highly Migratory Species (no HAPC).

Consultation History

From 2005-2007, staff from the USACE, U.S. Fish and Wildlife Service (USFWS), and NMFS collaborated on similar types of projects to develop the 2007 NLAA Program, which consisted of specific procedures, project types, and species-specific criteria to reduce adverse effects on listed species and their habitats from individual projects, singly or combined, to insignificant or discountable levels. On February 14, 2007, NMFS concurred with USACE's determination that the 2007 NLAA Program was not likely to adversely affect listed species and critical habitat. That concurrence expired on February 14, 2012.

Subsequent to the 2007 NLAA Program, USACE worked with NMFS to develop the 2013 NLAA Program and to review the 2007 NLAA Program, which served as a foundation for the 2013 NLAA Program. The USACE requested NMFS' concurrence with their NLAA programmatic determination for the proposed 2013 NLAA Program, renewable annually contingent on USACE's annual reporting to NMFS, for a period not to exceed five years. NMFS provided concurrence on August 13, 2013. After NMFS's concurrence, NMFS and USACE reviewed the 2013 NLAA Program annually via email and telephone contact, and exchanged lists of projects included in the program as needed.

After review of the 2013 NLAA Program, two additional project types have been added to the program by USACE (aids to navigation and geotechnical boring). In addition, two project types, bank stabilization and levee repair, have been removed from the program by USACE at the request of NMFS. These project types were removed due to concerns about increased potential for adverse effects based on information available to NMFS from other ESA section 7 consultations.

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.

NMFS has reviewed the information provided with the USACE concurrence request letters and other available information regarding each of the project types, including project criteria developed for the 2018 NLAA Program and past individual consultations on similar types of projects, and the information available from the 2007 and 2013 NLAA Programs. The proposed 2018 NLAA Program contains updated project categories and criteria, including new criteria for marine mammals (USACE, August 24 and September 5, 2018).

Based on the available information, NMFS has evaluated the proposed project types for adverse effects to the listed species and critical habitats listed above. The proposed project types may expose listed species and their critical habitats to several stressors, including the following: sound pressure waves from pile driving, turbidity and sedimentation, minor changes to or loss of the bed, banks, or shorelines of waterbodies in certain areas of California, encounters with construction equipment, including vessel collisions, and toxics. Table 2 summarizes the likely stressors from each project type, and the potential for species or critical habitat to be exposed to the stressors.

Table 2: Likely stressor from each project type and potential for species or critical habitat exposure

Likely Stressor	Docks, Piers, Wharfs	Bridges repair/widening	Culvert repair or replace	Buoys, single piling moorings	Pipeline repair	Geotechnical Boring	Aids to Navigation
Sound pressure waves from pile driving	Yes	Yes	No	Yes	No	No	Yes
Turbidity and/or sedimentation	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Changes to or loss of bed, banks, shorelines	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Encounters with construction equipment, toxics	Yes	No	No	Yes	No	Yes	Yes

The information from the last ten years of the NLAA Program indicates that most reported projects under the program involved the repair or replacement of docks, piers, wharfs, and bank and shoreline stabilization (Table 3, Figure 1). Some new docks were constructed.

Table 3: Project types and number of projects 2007-2018

Project Type	Number of Projects
Bank and Shoreline Stabilization	29 ^a
Docks, Piers, Wharfs	91
Bridges repair/widening	3
Culvert repair or replace	8
Levee repair	3
Buoys, single piling moorings	3
Pipeline repair or replace	6
Dredging ^b	0
Total	143

^a These categories have been removed from the 2018 NLAA Program due to concerns about the potential for adverse effects.

^b Because of the lack of use of this category in the previous NLAA Program, and decision by the Los Angeles Corps District not to participate in the Program, this category was dropped from the 2013 NLAA Program.



Figure 1. Site locations by project types during 2007-2018

Unlike the previous NLAA Program, NMFS anticipates the 2018 NLAA Program may see increased use outside of San Francisco Bay, resulting in potential impacts in a wider area of California.

Below is a discussion on the potential exposure and response of species and critical habitat to stressors from the proposed 2018 NLAA Program.

Sound Pressure Waves

Salmon, Steelhead, and Green Sturgeon and their critical habitats

Repair or replacement of docks, bridges, piers, wharfs, mooring devices, and navigational aids may involve pile driving, which creates sound pressure waves. Under the 2018 NLAA Program, pile driving with impact hammers is allowed in San Francisco Bay and the Sacramento/San Joaquin River Delta. Pile driving can adversely affect salmonids and green sturgeon through exposure to high underwater sound pressure levels. These sound pressure levels are generated as piles are struck by impact hammers used to drive them into the bed of waterbodies and adjacent areas such as exposed tidal mudflats or streambanks. The drastic changes in underwater sound pressure caused by pile driving with an impact hammer can hemorrhage and rupture internal organs, including a fish's swim bladder and kidneys, leading to injury and death (Gisiner 1998, Gaspin 1975, Hastings and Popper 2005, Popper 2006, Hastings 1995, Halvorsen *et al.* 2011). In addition, exposure to high underwater sound pressures may cause damage to fish sensory systems such as auditory tissue (Hastings *et al.* 1996, Enger 1981).

Using our current sound pressure metrics (NMFS 2011b) for the onset of physical injury to fish for different sizes and types of piles, NMFS worked with USACE to update criteria and procedures using the latest information. For example, the 2018 NLAA Program has pile size, type, and installation restrictions that avoid: 1) sound pressure levels higher than the single strike peak, and 2) sound exposure levels (SEL) that may rise instantaneously or accumulate to levels high enough to cause injury or death. Location and time of year restrictions are also included to ensure that when high sound pressure levels are generated that may cause a behavioral response, fish are not present, or have opportunities to leave the affected area, avoid predators, access foraging/refuge areas elsewhere, and continue migration.

Piles used for in-water construction are made from a variety of materials, including concrete, wood, and steel. Steel piles struck with an impact hammer are the most likely to produce sound pressure waves that can injure or kill fish. Fish injuries and mortality may also be associated with large concrete piles when a series of impact hammer strikes generate high levels of cumulative sound exposure levels. However, to date, there have been no records of fish kills or of fish in distress from impact hammering concrete or steel piles similar to the size considered here. The size limit (restricted to 12 inches in diameter for steel piles and 18 inches in diameter for concrete piles) and number that may be installed per day² make it extremely unlikely that salmonids or sturgeon will be adversely affected. The pile diameter size limit, type of hammer and energy produced, and the requirement for a wood cushion between hammer and pile avoid any single strike producing sound pressure waves that could injure or kill fish.

² NMFS defines a day to be the entire duration of a pile driving event until at least a 12-hour break in pile driving occurs.

To determine the sound pressures levels that fish are exposed to from pile strikes, NMFS uses a dual metric criteria of 206 dB referenced to one micropascal (re: 1 μ Pa) peak sound pressure level (SPL) for any single strike and cumulative sound exposure level (SEL_{cum}) of 187 dB re: 1 μ Pa² - sec for fish greater than or equal to 2 grams and 183 SEL_{cum} for fish smaller than 2 grams. Our assessment uses the practical spreading model for sound transmission loss (15Log(R)) in order to estimate the likely distance from the pile where sound pressure levels may injure or kill fish. We used pile driving sound pressure wave data from Buehler *et al.* (2015) to inform our assessment. Based on our assessment, 12-inch steel piles and 18-inch concrete piles are not anticipated to generate sound pressure levels that will injure or kill fish from any single peak pile strike. However, repeated striking may accumulate to sound pressure levels high enough to affect listed salmonids or green sturgeon if they were to remain near (within 15 feet for steel piles and 50 feet for concrete piles) a pile for the duration it would take to install 20 12-inch steel pipe or 18-inch concrete piles. NMFS expects the likelihood of this occurring to be so remote as to be discountable. As described above, salmonids and green sturgeon will be able to vacate areas near piles as construction equipment is moved on site, readied for use, and as the first few strikes of a pile occurs. NMFS uses a 150 dB root mean square pressure threshold for behavioral responses for salmonids and green sturgeon. Based on this threshold, pile driving may also produce behaviors such as a startle response in salmonids and green sturgeon within 1,000 feet of piles being driven.

NMFS does not believe the behavioral impacts to salmonids or green sturgeon such as startle responses or leaving the site of pile driving will have any adverse effects on these fish when pile driving occurs in bays and estuaries. Estuaries and bays, even relatively small ones, provide salmonids and green sturgeon with large areas in which to move once they are disturbed by pile driving, making it unlikely that predators will be able to wait in certain areas that concentrate fish trying to avoid pile driving areas. Because of the short duration of sound pressure waves (each pile strike), and miniscule impacts to the availability of areas for salmonid and green sturgeon foraging, migrating, and rearing, impacts to critical habitat are expected to be insignificant. In addition, based on these factors and others described above, impacts to listed fish in bays and estuaries from sound pressure waves generated by these project types are expected to be insignificant.

Pile driving in the 2018 NLAA Program will not be allowed in freshwater rivers or streams when water is present at the construction site. In addition, pile driving may not occur within 1,000 feet of flowing or standing water in streams. Based on these restrictions, and the use of our current sound pressure metrics described above, NMFS expects riverbed and bank soils between pile driving and flowing or standing water will reduce sound pressure waves from pile driving to levels that are insignificant for any NMFS listed fish species or critical habitat near the pile driving sites.

Marine Mammals

Sounds introduced into the sea by human-made devices (*e.g.*, pile-driving with a hydraulic hammer or pile-jetting) could have a deleterious effect on marine mammals by causing stress, interfering with communication and predator/prey detection, and changing behavior. More significantly, acoustic overexposure to loud sounds can lead to a temporary or permanent loss of hearing (termed a temporary or permanent threshold shift, TTS and PTS, respectively).

NMFS has determined thresholds for behavioral take (Table 4) and PTS (Table 5) of marine mammals. To avoid taking any marine mammal, a shutdown zone at least equal to the PTS zone for each species will be implemented.

Table 4: Current Acoustic Exposure Criteria for Level B Harassment

Criterion	Definition	Threshold
Underwater	Behavioral disruption	160 dB (impulsive source) / 120 dB (continuous source) (rms)
Airborne	Behavioral disruption	90 dB (harbor seals) / 100 dB (other pinnipeds) (unweighted)

Table 5: Thresholds Identifying the Onset of Permanent Threshold Shift

Hearing Group	Generalized Hearing Range*
Low-frequency (LF) cetaceans (baleen whales)	7 Hz to 35 kHz
Mid-frequency (MF) cetaceans (dolphins, toothed whales, beaked whales, bottlenose whales)	150 Hz to 160 kHz
Otariid pinnipeds (OW) (underwater) (sea lions and fur seals)	60 Hz to 39 kHz

* Represents the generalized hearing range for the entire group as a composite (*i.e.*, all species within the group), where individual species' hearing ranges are typically not as broad. Generalized hearing range chosen based on ~65 dB threshold from normalized composite audiogram, with the exception for lower limits for LF cetaceans (Southall *et al.*, 2007) and PW pinniped (approximation).

In order to avoid adverse effects, the 2013 NLAA Program proposed special conditions in areas where marine mammals are likely to occur. These conditions require NMFS-approved observers to perform of visual scan of the viewable areas around the project site prior to commencement of pile installation or removal activities, as well as after a break of more than 30 minutes in these activities. If any marine mammals are located within the PTS zone, the Permittee must shutdown activities until the animal has been resighted outside of the zone, or until at least 30 minutes have passed without redetection of the animal before beginning pile installation or removal activities. If any of these animals move within PTS zone during the initial stages, the Permittee will not continue these activities until 30 minutes has passed since the last such sighting. Prior to the start of each day, after a break of 30 minutes or more, or anytime the intensity of pile installation or removal activity needs to be increased, the Permittee shall use a ramp-up procedure involving a slow increase to avoid impacts to animals that may be utilizing habitat in the vicinity of the project. Thus, NMFS expects effects on marine mammals from sound pressure waves will be insignificant or discountable.

Leatherback sea turtles and their critical habitat

The locations of projects and special conditions proposed by the Corps 2018 NLAA Program described above for marine mammals are also likely to result in discountable or insignificant effects to leatherback sea turtles from underwater sound pressure waves. Most of the pile driving under the Program is likely to occur in San Francisco Bay. Leatherback sea turtles have only rarely³ been observed in San Francisco Bay, making their exposure to sound pressure waves from Program projects in San Francisco Bay extremely unlikely.

Leatherback sea turtles are known to occur more frequently in nearshore coastal waters and bays outside of San Francisco Bay. Their critical habitat includes all the nearshore marine waters that could be affected by Corps 2018 NLAA Program projects. In some rare instances, pile driving for the replacement of navigational buoys or moorings could occur in areas where leatherback sea turtles would be present⁴. In these cases, NMFS expects effects from underwater sound pressure waves would be insignificant because the program requires observers and cessation of pile driving if turtles are spotted, ramp up procedures once any turtles have left the project area, and limits on the size and types of piles, among other protections. Leatherback sea turtle hearing is likely similar to the marine mammal low frequency hearing specialist group, which was included during the development of the Program's criteria to avoid adverse effects from underwater sound pressure waves.

Leatherback sea turtle critical habitat will experience short temporary impacts from increases in underwater sound pressure waves. These impacts will cease once pile driving stops, and critical habitat in area affected by underwater sound pressure waves will return to its previous condition immediately with regard to underwater sound. While prey for leatherback sea turtles (jellyfish) might be affected by underwater sound pressure waves, the extremely limited area and temporary nature of potential effects from projects relative to the vast areas where prey resources may be found makes any effects on prey items inconsequential. Therefore, NMFS expects effects from underwater sound pressure waves on sea turtle critical habitat will be insignificant.

Turbidity and Sedimentation

Salmon, steelhead, and green sturgeon and their critical habitats

Turbidity and suspended sediment levels can affect fish by disrupting normal feeding behavior, reducing growth rates, increasing stress levels, and reducing respiratory functions (Cordone and Kelley 1961, Bjornn *et al.* 1977, Crouse *et al.* 1981, Sigler *et al.* 1984, Berg and Northcote 1985, Servizi and Martens 1992, Gregory and Northcote 1993; Velagic 1995; Waters 1995). The impacts of turbidity on salmonids are largely linked to factors such as background turbidity levels and the duration of turbid conditions (Bisson and Bilby 1982, Sigler *et al.* 1984, Newcombe 2003). Much less is known about the impacts of turbidity on juvenile, young adult, and adult green sturgeon. NMFS assumes they are less likely to be affected by turbidity (including suspended sediment) than salmonids, because green sturgeon live and forage in more turbid environments associated with estuaries, bays, and large rivers like San Francisco Bay and the Sacramento River. Turbidity and

³ NMFS found one record of a sea turtle sighting in San Francisco Bay: <https://seaturtles.org/newssection/rare-sea-turtle-in-san-francisco-bay-boaters-urged-to-slow-down-to-avoid-a-deadly-collision/>

⁴ Pile driving for bridge repair or replacement cannot occur under the Program in marine or estuarine areas.

sedimentation can affect critical habitat for fish by reducing availability of food and feeding efficiency, degrading spawning areas, blocking migrations, and increasing exposure to toxic substances (Newcombe and Jensen 1996).

NMFS expects stream bed and/or bank disturbance associated with some 2018 NLAA Program projects. Work on culverts, bridges, and pipelines, may result in small amounts of sediment entering streams during the first rains of the rainy season because these projects are likely to leave small areas of disturbed soils. Disturbed soils can be washed into streams by rain or when water rises in disturbed stream beds or up disturbed banks during storms. Listed salmonids and green sturgeon, and their critical habitats may be exposed to the resulting turbidity and sedimentation.

Any amount of sediment and/or turbidity in streams generated by projects under the 2018 NLAA Program will likely be very small, temporary, and localized because of project size limitations and other measures (erosion control measures and vegetation removal limitations as examples). Due to these measures, the effects of sediment and turbidity from these projects on listed salmonids, green sturgeon, and their critical habitats are likely to be insignificant in freshwater streams.

In estuarine, bay, and coastal marine environments, sediment and turbidity may be generated during boring in support of project design work⁵, or during pile driving or removal operations associated with bridges, docks, wharfs, piers, and buoys, moorings, or other navigational devices. Turbidity from these operations is likely to be localized and temporary, quickly dispersing (and lessening in severity) due to the large volume of surrounding waters and tidal currents in these waters, as well as other measures such as slow speed removal of piles.

Because of quick dispersion by currents, NMFS expects the response of salmonids exposed to this turbidity will be limited to avoidance reactions if salmonids occur near project-related suspended sediment and turbidity. NMFS expects salmonids are likely to avoid these areas of temporary suspended sediment and turbidity by swimming away from them. Similar to sound pressure waves, if salmonids are disturbed by turbidity, the large areas available to them to move will ensure that they are not forced into areas that concentrate them, exposing them to higher rates of predation. In the Delta, project timing restrictions are likely to ensure that salmonids are not exposed to turbidity from these projects. Green sturgeon may also avoid areas with turbidity from these projects, or, because they are more accustomed to foraging on bay and estuarine bottoms in areas with sediment and turbidity, they may not respond to the small amounts of sediment and turbidity from projects under the 2018 NLAA Program.

Any exposure of salmonid or green sturgeon critical habitat to sedimentation resulting from these projects will likely be very small, temporary, and localized because of the small amount of estuarine or marine substrate disturbed by pile driving or removal. The impact on the total amount of habitat space or forage for green sturgeon or salmonids will be very small, if any, and insignificant; much larger areas will be undisturbed by these projects. Because of the short duration of turbidity from these projects, and unlikely impacts to the availability of areas for salmonid and green sturgeon rearing, foraging, and migration habitats, effects to critical habitat from sediment and turbidity are likely insignificant.

⁵ Boring done for project design purposes may not occur in flowing or standing water and only miniscule amounts of ground disturbance near streams are anticipated by NMFS.

Marine Mammals

The small amounts of turbidity generated by these projects in marine environments are expected to be insignificant to marine mammals. Marine mammals exposed to turbidity from projects conducted under the 2018 NLAA Program may temporarily vacate the areas with higher turbidity. Because marine mammals are highly mobile, and turbidity episodes are anticipated to be short and minor (due to project size and timing), NMFS expects any marine mammal behavioral response will not affect their ability to find food, avoid predators, or any other essential life functions. Marine mammals are expected to move away from any turbidity generated by projects conducted under the 2018 NLAA Program. As described for potential impacts to salmonids and green sturgeon above, any amounts of sedimentation resulting from these projects will likely be very small and localized because of the small amount of estuarine or marine substrate disturbed by pile removal or driving. The impact on the total amount of habitat space or forage is expected to be very small, if any, and insignificant.

Leatherback sea turtles and their critical habitat

Similar to marine mammals above, leatherback sea turtles exposed to turbidity from projects conducted under the 2018 NLAA Program may temporarily vacate the areas with higher turbidity. Because sea turtles are mobile, and turbidity episodes are anticipated to be short and minor (due to project size and timing), NMFS expects any leatherback sea turtle behavioral response will not affect their ability to find food, avoid predators, or any other essential life functions.

Any amounts of sedimentation resulting from these projects will likely be very small and localized because of the small amount of estuarine or marine substrate disturbed by project activities. The impacts on the total amount of critical habitat space or prey items is expected to be very small and insignificant.

Minor Changes to Bed, Banks, or Shorelines

Salmon, Steelhead, and Green Sturgeon and their critical habitats

Projects under the 2018 NLAA Program may expose salmonids, green sturgeon, and their critical habitats to short-term, long-term, or permanent changes to stream beds, banks, and shorelines. For example, construction of some projects along streams may remove small amounts of riparian vegetation. Pile driving projects may result in new docks in San Francisco Bay. The response of salmonids, green sturgeon, and their critical habitat to these changes are likely to be insignificant due to the proposed methods and materials that minimize effects and that preserve and enhance riparian and aquatic habitat. For example, culvert projects must meet NMFS' fish passage guidelines to qualify for the 2018 NLAA Program. Other project types, like pipelines, are likely to leave stream bed and banks minimally disturbed after construction, to the extent that adverse effects to critical habitat are discountable or insignificant. For example, pipeline repair or replacement must be done in naturally dry stream areas and must leave bed and banks as found outside of the project footprint. Grade control structures to protect pipelines must have prior evaluation and approval by NMFS to ensure such structures do not adversely affect salmonid habitat. NMFS does not anticipate tree removal will influence stream temperatures because tree removal for access to construction sites will

be minimal. For example, canopy cover provided by hardwoods or conifer may not be reduced. Any trees removed must be replanted.

Similarly, new or replaced docks, wharfs, or piers, moorings, navigational aids, replaced or widened bridges over waterbodies, and geotechnical boring in support of project designs are expected to result in insignificant effects to species and critical habitats because of the small size of the disturbance or structures (and any vessels associated with them) included in the 2018 NLAA Program. For example, new dock structures are limited to no more than 1,500 square feet. This small size and light transmittal requirements will not shade large enough areas to reduce the production of salmonid or green sturgeon prey items in bays and estuaries. Individuals of these species will still be able to find food. Boats using new or replaced docks or moorings are anticipated to be small given the size of construction allowed. Persistently moored vessels are not allowed, further minimizing the potential for adverse effects. While increased predation (from birds and fish) on salmonids can be a serious concern with docks and similar structures in some areas, this is unlikely to be a significant risk from the 2018 NLAA Program. This project type will typically occur in San Francisco Bay and the Delta. These waters are very large compared to the size of the new structures or repair work allowed. Salmonids are likely migrating or feeding far away from the project locations (industrial areas, marinas, or other developed shorelines). In addition, bird spikes or similar devices to disrupt bird perching are required in situations where pilings may provide bird perching areas. NMFS will also provide case-by-case technical assistance to the Corps regarding whether or not to include new or replaced docks in the tidally influenced portions of rivers. Some dock projects may not be included in the 2018 NLAA Program where predation (by fish or birds) remains a concern. Thus, salmonids are unlikely to encounter increased predation from new or repaired docks and similar structures as a result of the 2018 NLAA Program.

Bridges, if replaced, must be sized to pass 100 year flow events with encroachment into stream channels. This criterion minimizes impacts to channel form and function that could affect salmonid and green sturgeon critical habitat at and near bridge sites. Widened bridges are expected to result in insignificant effects to salmonids, green sturgeon and their critical habitat in streams because of their small footprint relative to the shade already provided by the bridge prior to widening. Shade from widened structures may in some cases provide more refuge habitat from high water temperatures.

Marine Mammals

NMFS does not anticipate marine mammals will be adversely affected by changes to shorelines, estuarine bottoms, or channels from new docks, wharfs, or piers, or buoys or other navigation aids. For example, new docks will not be proposed in seal or sea lion haul out areas. Similarly, changes in shorelines or channels shouldn't overlap with areas biologically important to whales due to both the timing of construction activities and location of small project areas close to shore. Thus, whales are extremely unlikely to be present in these locations. Under the 2018 NLAA Program, bridge repair, replacement, removal, or widening, culvert replacement, removal, or upgrades, and pipeline projects will not occur in estuaries, bays, or other marine areas used by marine mammals, avoiding exposure to effects from these project types. Repair or replacement of currently existing docks, piers, or wharfs is not expected to change current conditions for marine mammals seeking to use shorelines.

Only small new docks may be constructed and repairs may not increase the size of larger docks by more than 1,500 square feet. Thus, no decrease in haul out areas available to seals or sea lions is expected.

Leatherback sea turtles and their critical habitat

NMFS does not expect leatherback sea turtles will be adversely affected by changes to marine and estuarine waters or bottoms from moorage devices or navigational aids⁶. These devices are extremely small compared to the large area of nearshore marine environment available to sea turtles and sea turtles will be easily able to maneuver around moorage devices and navigational aids. In addition, most of these devices are likely to be located in San Francisco Bay, where leatherback sea turtles are unlikely to occur (and their critical habitat is absent) based on past activity under this Program. Similarly, permanent impacts on sea turtle critical habitat from the installation of navigational aids or moorage devices in the nearshore marine environment will be extremely small and insignificant. Vast areas of critical habitat will remain available to sea turtles in which prey items can be found.

Exposure to Construction Equipment and Toxic Materials

Work in streams, estuaries, and bays can injure or kill salmonids, green sturgeon, and marine mammals if these species are exposed to construction equipment, including vessels. For example, fish can be crushed by construction equipment in stream channels and work boats or barges could collide with marine mammals. Construction equipment can also leave fluids and other materials in work areas that may result in species exposure to toxic materials.

Salmon, Steelhead, and Green Sturgeon

The following project types will be done when streambeds are dry, eliminating the possibility of contact between construction equipment and listed salmonids: bridge repair, widening, or replacement, culvert replacement or repair, pipelines, and geotechnical boring in support of project designs. Because salmonids will not be present, they will not be exposed to construction equipment. Similarly, green sturgeon will not be exposed to construction equipment, because they will not be present in dry streambeds when projects occur. In estuaries, bays, and marine areas, NMFS expects salmonids and green sturgeon will avoid construction areas as construction equipment is moved on site making the chance of collision with construction equipment discountable. Marine mammal observers must be used and vessels must be operated at no-wake speed if marine mammals are nearby, which makes marine mammal encounters with construction equipment extremely unlikely.

Projects under the 2018 NLAA Program must incorporate measures to reduce the chance of toxins entering stream beds, banks, or other water bodies. Pollution control measures, such as checking heavy equipment daily for leaks, refueling vehicles outside of the stream bed, and avoiding the use of toxic drilling fluids below ordinary high water will be implemented. Projects in bays and estuaries will have pollution control measures such as daily checks of heavy equipment for leakage of toxic

⁶ Under the 2018 NLAA Program, docks, wharfs, and piers; bridge repair, replacement, removal, or widening; culvert replacement, removal, or upgrades; , and pipeline projects will not occur in estuaries, bays, or other marine areas that may be used by leatherback sea turtles, avoiding their exposure to effects from these project types.

materials, and recirculation and collection of drilling fluids. Due to these measures, NMFS expects that toxic chemical contamination of the action area will be minimized to levels that are insignificant and unlikely to adversely affect any fish exposed to these toxic chemicals.

Marine Mammals

Because of the avoidance measures described in the USACE's project criteria for projects that occur where marine mammals may be found (such as visual surveys for marine mammals) and measures described above to reduce impacts from toxic materials (*e.g.*, checking heavy equipment daily for leaks, etc.) or vessel collisions (no-wake speed operation when marine mammals are observed in the project area), NMFS does not expect marine mammals to be injured or killed by construction equipment, or exposed to more than insignificant levels of toxic materials from the 2018 NLAA Program.

Leatherback sea turtles and their critical habitat

Because of the avoidance measures described in the USACE's project criteria for projects that occur where leatherback sea turtles may be found (such as visual surveys for turtles) and measures described above to reduce impacts from toxic materials (checking heavy equipment daily for leaks, etc.) or vessel collisions (no-wake speed operation when turtles are observed in the project area), NMFS does not expect leatherback sea turtles to be injured or killed by construction equipment. Similarly, NMFS does not expect leatherback sea turtles or their critical habitat to be exposed to more than insignificant levels of toxic materials from the 2018 NLAA Program.

Combined Effects

NMFS does not anticipate that impacts from individual projects such as sound pressure waves, turbidity and sedimentation, toxic materials, and minor changes to stream beds, banks, and shorelines will combine to produce adverse effects at the scale of individual projects or at the scale of the 2018 NLAA Program. For example, salmonids and green sturgeon are unlikely to experience exposure to combined effects at the project scale because they will not be present when projects generating various stressors occur in freshwater streams.⁷ Sound pressure waves from pile driving in freshwater streams to repair bridges will be completed prior to salmonid use of stream channels under the bridge.

In San Francisco Bay, the Delta, and other marine and estuarine areas, turbidity, sedimentation, and disturbance from activities associated with pile driving (setting up piles for driving, removing old piles, etc.) are likely to result in salmonids leaving construction areas prior to sound pressure waves from pile driving occurring, or prior to receiving all the accumulated sound from a day of pile driving. Green sturgeon may stay during the initial set up for pile driving, but are expected to leave the area once pile driving begins.

At the scale of the 2018 NLAA Program, NMFS expects that projects will be separated in time or space such that each project's impacts, as described above, on the environment are unlikely to combine to a level that would adversely affect listed salmonids, green sturgeon, or their critical

⁷Projects may only occur in freshwater streams without flowing or standing water.

habitats. For example, USACE will require 1,000 linear feet of separation between projects in freshwater streams if they occur during the same year. NMFS expects that a 1,000 foot buffer between projects will prevent accumulation of sediment and turbidity due to the minor amounts of sediment and turbidity expected. Moreover, any effects on stream temperatures at construction sites following removal of riparian vegetation would be unlikely to extend beyond the construction site due to the small amount of riparian tree removal allowed. Similarly, USACE will require at least 1,000 feet of separation between projects that can generate underwater sound from pile driving. Larger distances will be used if needed for marine mammals and sea turtles. These distances are likely beyond the area where behavioral effects may occur and eliminate the potential for sound pressure waves to accumulate from multiple projects and result in adverse effects. These distances also ensure that any sediment and turbidity generated by these projects, or other effects (minor releases of toxic materials for example) will be quickly diluted by the large volume of water, waves, and currents found where these projects are likely to occur. Thus, combined effects to listed salmonids, green sturgeon, or their critical habitats are unlikely to occur.

NMFS does not anticipate that the effects of individual projects conducted under the USACE's 2018 NLAA Program will accumulate into any adverse effects for marine mammals or leatherback sea turtles. Similar to above, interactions between any and all proposed project effects, the effects of multiple projects, and resulting impacts on marine mammals or leatherback sea turtles are expected to result in only very short term disturbances, which are expected to be insignificant (due to the requirement to avoid marine mammal and turtles, ramp-up procedures for pile driving, and the distance in space and time between projects).

Conclusion

Based on the best available information, NMFS concurs that the 2018 NLAA Program is not likely to adversely affect ESA listed salmonids, green sturgeon, leatherback sea turtles, and marine mammals under NMFS' jurisdiction or the designated critical habitats of listed salmonids, green sturgeon, or leatherback sea turtle. Note that listed pacific Eulachon, white abalone, and black abalone, and designated critical habitat for these species, and critical habitats for listed marine mammals are not included in the 2018 NLAA Program. Therefore, projects that may affect listed pacific Eulachon, white abalone, and black abalone, or their critical habitat, or the critical habitat of marine mammals would need individual consultations with NMFS.

This concludes ESA section 7(a)(2) consultation for the 2018 NLAA Program. Reinitiation of consultation is required where discretionary Federal agency involvement or control over the action has been retained (or is authorized by law), and if: (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 action is subsequently modified in a manner that causes adverse effects to listed species or critical habitat that was not previously considered; or (3) a new species is listed or critical habitat designated that may be affected by this action. Finally, if a project proposed under the 2018 NLAA Program is likely to adversely affect listed species or critical habitat, USACE is required to initiate formal consultation for that project.

MAGNUSON-STEVENSON 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.

NMFS determined the proposed action would adversely affect EFH as follows:

Boat Docks, Piers, and Wharfs

Dock reconfiguration can degrade EFH through shading, replacement of soft bottom habitat with placement of piers and other supporting structures, modifying water circulation by temporarily affecting water column habitat during construction activities, and disturbance via activities associated with the use and operation of the facilities (Nightingale and Simenstad 2001). The shadow cast by an overwater structure affects both the plant and animal communities below the structure by limiting light for photosynthesizers, such as diatoms and benthic algae, eelgrass, and other macrophytes (Kahler *et al.* 2000, Haas *et al.* 2002), and by increasing predation by providing cover and perching platforms for piscivores (Helfman 1981). Wave energy and water transport alterations can impact the nearshore, detrital foodweb by altering the size, distribution, and abundance of substrate and detrital materials.

The measures included in the project description, including limiting the activity to allow for only small increases in dock footprint, removal of creosote piles, and limiting size of new docks will minimize adverse effects of this activity to EFH.

Pile driving can generate underwater sound pressure waves that may adversely affect the ecological function of EFH by modifying the water column such that managed fish and prey species are killed, harmed, or injured (CalTrans 2001, Longmuir and Lively 2001, Stotz and Colby 2001, Abbott and Bing-Sawyer 2002). The type and intensity of the sounds produced during pile driving depend on a variety of factors, including but not limited to, the type and size of the pile, the firmness of the substrate into which the pile is being driven, the depth of the water, and the type and size of the pile-driving hammer. Wood and concrete piles appear to produce lower sound pressures than hollow steel piles of similar size. Vibratory hammers produce lower intensity sounds than impacts hammers. Limitation on hammer type and size and type of pile included in the project description should minimize adverse effects to EFH.

The primary adverse effect of removing piles is the suspension of sediments, which may result in harmful levels of turbidity and release of contaminants contained in those sediments. Vibratory pile removal tends to cause the sediments to slough off at the mud line, resulting in relatively low levels of suspended sediments and contaminants. Vibratory removal of piles is gaining popularity because it can be used on all types of piles, if they are structurally sound. Breaking or cutting the pile below the mud line may suspend only small amounts of sediment, if the stub is left in place and little

digging is required to access the pile. Direct pull or use of a clamshell to remove broken piles, however, may suspend larger amounts sediment and contaminants. When the piling is pulled from the substrate using these two methods, sediments clinging to the piling will slough off as it is raised through the water column, producing a potentially harmful plume of turbidity and/or contaminants. The use of a clamshell may suspend additional sediment if it penetrates the substrate while grabbing the piling.

While there is a potential to adversely affect EFH during the removal of piles, many of those removed are old creosote-treated timber piles. In some cases, the long-term benefits to EFH obtained by removing a consistent source of contamination may outweigh the temporary adverse effect of turbidity.

Measures have been included in the project description to minimize impacts to EFH. For example, there are pile size limits and area restrictions for impact hammers. In addition, there are measures to reduce sedimentation from pile removal such as slow pulling of piles. These measures echo common EFH conservation recommendations provided by NMFS for similar types of projects. Based on NMFS' experience with these measures, NMFS expects they will be effective in minimizing adverse effects to EFH.

Bridge Repairs/Widening/Replacement

Activities could adversely affect EFH through loss of natural bottom substrate within the footprint of bridge components and modification of flow and currents from placement on bridge components within the river channel. Measures included in the project description that limit projects to bridge replacements and riverine habitats without encroachment into the stream channel will minimize adverse effects to EFH.

Culvert/Replacement Upgrade

Culvert replacement projects will be limited to riverine habitats. Adverse effects of these activities include temporary disturbance of the water column and substrate during activities, permanent conversion of natural embankments and substrate with artificial, hard substrate, and potential scouring of soft bottom sediments from flow directly through the culvert. Measures in the project description such as limiting activities to replacement, repair, or upgrade of existing structures, and ensuring fish passage standards are met, will minimize adverse effects to EFH.

Devices to Facilitate Mooring and Aids to Navigation

Buoys are a common method for directing vessel traffic and anchoring boats; however, their chains can drag across the seafloor tearing up vegetation. Mooring chains typically have the most impact, as they are often more densely concentrated in nearshore areas. In addition to uprooting seagrass, mooring chains can alter sediment composition ultimately impacting the benthic biota (Ostendorp *et al.* 2008). Walker *et al.* (1989) investigated the impacts of mooring buoys in Western Australia and found the 5.4 hectares of seagrass had been lost to mooring. The location of the damage within the bed may influence the extent of damage with more significant impacts associated with mooring in the center of the bed versus along the edge. The trend of seagrass loss from boat moorings is

increasing. This correlates with increased vessel use (Hastings *et al.* 1995). Examples of mooring chain damages are evident throughout the world Jackson *et al.* 2002, Hiscock *et al.* 2005, Otero 2008).

Williams and Bechter (1996) examined the effects of 5 different mooring systems on marine vegetation. Their study concluded that mid-line float systems and all-rope lines had the least impact on substrate and aquatic vegetation. Disturbance impact of the remaining mooring types (*e.g.*, swinging chain moorings) ranged from 86 percent to 100 percent disturbance.

Measures are included in the project description that will minimize the impact of chains on sensitive habitats including the use of midline floats and the avoidance of new anchored moorings in SAV, canopy kelp, and rocky reefs. NMFS expects these measures will minimize impacts to EFH.

Pipeline Repairs and Replacement

Adverse effects to EFH from pipeline installation can occur through destruction of organisms and habitat during construction, increases in turbidity, resuspension of contaminants, and changes in hydrology (Hanson *et al.* 2003). Limitations for working in flowing water included in the project description should minimize adverse effects of pipeline repair projects in freshwater habitats.

Geotechnical Boring in Support of Project Designs

Adverse effects to EFH from geotechnical boring can occur through loss or contamination of habitat. For example, boring holes in estuarine or river beds or banks can result in localized losses of organisms that serve as prey items for fish. If toxic drilling materials escape into the environment, EFH can become contaminated by toxic chemicals.

Measures have been included in the project description that will largely avoid or minimize adverse effects to EFH from geotechnical boring. For example, boring may not occur in flowing or standing water in freshwater streams. In all cases, drilling fluids must be non-toxic or recirculated through the drilling rig and ultimately collected for appropriate offsite disposal.

Conclusions

As described in the above effects analysis, NMFS determines that the proposed actions would adversely affect EFH for various federally managed fish species within the Pacific Coast Groundfish, Pacific Coast Salmon, and Coastal Pelagic Species FMPs. The proposed actions contain measures to avoid, minimize, mitigate, or otherwise offset the majority of adverse effects to EFH. Due to these minimization and avoidance measures, NMFS has no EFH conservation recommendations to provide at this time.

USACE 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(1)). This concludes the MSA portion of this consultation.

Please direct questions regarding this letter to Eric Shott, North Central Coast Office, Operations and Policy Branch, at (707)-575-6089 or eric.shott@noaa.gov.

Sincerely,



Barry A. Thom.
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