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

February 28, 2020 **Refer to NMFS No:** WCRO-2019-03483

L. Kasey Sirkin
Lead Biologist
U.S Army Corps of Engineers
601 Startare Drive, #13
Eureka, CA 95501

Re: Endangered Species Act Section 7(a)(2) Biological Opinion, and Magnuson-Stevens Fishery Conservation and Management Act Essential Fish Habitat Response for the Tidewater, Inc. Gravel Extraction on the Huffman and Sultan Bars in the Smith River for the years 2020-2029.

Dear Ms. Sirkin:

Thank you for your letter of October 8, 2019, requesting initiation of consultation with NOAA's National Marine Fisheries Service (NMFS) pursuant to section 7 of the Endangered Species Act of 1973 (ESA) (16 U.S.C. 1531 et seq.) for Tidewater, Inc. Gravel Extraction on the Huffman and Sultan Bars in the Smith River for the years 2020-2029 (Project). This consultation was conducted in accordance with the 2019 revised regulations that implement section 7 of the ESA (50 CFR 402, 84 FR 45016).

Based on the best scientific and commercial information available, NMFS concluded in the enclosed biological opinion that the proposed action is not likely to jeopardize the continued existence of the Southern Oregon/Northern California coast (SONCC) coho salmon or adversely affect designated critical habitat. However, NMFS anticipates incidental take of SONCC coho salmon will occur and an incidental take statement with non-discretionary terms and conditions is included with the enclosed biological opinion.

NMFS also reviewed the likely effects of the proposed action on essential fish habitat (EFH), pursuant to section 305(b) of the Magnuson-Stevens Fishery Conservation and Management Act (16 U.S.C. 1855(b)), and concluded that the action would have adverse effects on the EFH of Pacific Coast salmon. However, no additional conservation recommendations are necessary.

Please contact Dan Free, NMFS Arcata Office, (707) 825-5164, Dan.Free@noaa.gov if you

have any questions concerning this consultation, or if you require additional information.

Sincerely,

Alecia Van Atta
Assistant Regional Administrator
California Coastal Office

Enclosure

cc: Copy to ARN File 2009AR00270
Stuart Blanco, Tidewater, Inc, Brookings, OR

**Endangered Species Act (ESA) Section 7(a)(2) Biological Opinion and Magnuson-Stevens Fishery Conservation and Management Act Essential Fish Habitat Response**

Tidewater, Inc. Gravel Extraction on the Huffman and Sultan Bars in the Smith River for the Years 2020-2029

NMFS Consultation Number: WCRO-2019-03483
Action Agency: U.S. Army Corps of Engineers

Table 1. Affected Species and NMFS' Determinations:

| ESA-Listed Species | Status | Is Action Likely to Adversely Affect Species? | Is Action Likely To Jeopardize the Species? | Is Action Likely to Adversely Affect Critical Habitat? | Is Action Likely To Destroy or Adversely Modify Critical Habitat? |
|---|---|---|---|---|---|
| Southern Oregon/Northern California Coastal coho salmon | Threatened | Yes | No | Yes | No |

Table 2. Essential Fish Habitat and NMFS' Determinations:

| Fishery Management Plan That Identifies EFH in the Project Area | Does Action Have an Adverse Effect on EFH? | Are EFH Conservation Recommendations Provided? |
|---|---|---|
| Pacific Coast Salmon | Yes | No |

**Consultation Conducted By:** National Marine Fisheries Service, West Coast Region

**Issued By**:

Alecia Van Atta
Assistant Regional Administrator

**Date**: February 28, 2020

**Table of Contents**

# 1. INTRODUCTION

This Introduction section provides information relevant to the other sections of this document and is incorporated by reference into Sections 2 and 3 below.

## 1.1 Background

NOAA's National Marine Fisheries Service (NMFS) prepared the biological opinion (opinion) and incidental take statement (ITS) portions of this document in accordance with section 7(b) of the Endangered Species Act (ESA) of 1973 (16 USC 1531 et seq.), and implementing regulations at 50 CFR 402, as amended.

We also completed an essential fish habitat (EFH) consultation on the proposed action, in accordance with section 305(b)(2) of the Magnuson-Stevens Fishery Conservation and Management Act (MSA) (16 U.S.C. 1801 et seq.) and implementing regulations at 50 CFR 600.

We completed pre-dissemination review of this document using standards for utility, integrity, and objectivity in compliance with applicable guidelines issued under the Data Quality Act (DQA) (section 515 of the Treasury and General Government Appropriations Act for Fiscal Year 2001, Public Law 106-554). The document will be available within two weeks at the NOAA Library Institutional Repository [https://repository.library.noaa.gov/welcome]. A complete record of this consultation is on file at NMFS Arcata Office.

## 1.2 Consultation History

NMFS last completed a section 7 consultation with the Corps on a very similar proposed action by Granite Construction, Inc. on April 19, 2010, which covered the years 2010-2019. Tidewater Contractors, Inc. purchased the gravel mining operations on the Smith River from Granite Construction, Inc. and implemented the proposed action until December 31, 2019, when the section 404 permit expired.

During the Summer of 2019, NMFS discussed a new proposed action and reviewed the biological assessment for the issuance of a section 404 Clean Water Act Permit to Tidewater Contractors, Inc. for gravel extraction operations on the Huffman and Sultan Bars for the years 2020-2029, culminating with the receipt of a complete initiation package on October 17, 2019, with the applicant's biological assessment (Tidewater 2019). NMFS notified the Corps and the applicant, Tidewater Contractors, Inc. on November 18, 2019, that the initiation package was complete.

## 1.3 Proposed Federal Action

"Action" means all activities or programs of any kind authorized, funded, or carried out, in whole or in part, by Federal agencies (50 CFR 402.02). For an EFH consultation, Federal action means any action authorized, funded, or undertaken, or proposed to be authorized, funded, or undertaken by a Federal Agency (50 CFR 600.910). The Army Corps of Engineers (Corps) proposes to issue a section 404 Clean Water Act permit to Tidewater Contractors, Inc. to extract sand and gravel from its Huffman Bar (up to 50,000 cubic yards [CY] annually) and Sultan Bar

(up to 25,000 CY annually), which are both located within the Smith River Watershed near Fort Dick, in Del Norte County, California. The duration of the section 404 permit is the ten-year period from the permit issuance date in 2020 until December 31, 2029.

We considered whether or not the proposed action would cause any other activities, including population growth inducing activities or expansion of urban areas or roads, and determined that it would not cause any additional activities.

**Pre-Extraction Planning**

Pre-extraction planning will begin with an analysis of current aerial photography and establishing potential gravel extraction locations. In the spring of each year, Tidewater will invite all Federal, State and local agencies involved in the permitting process to visit the sites. During the site visits, Tidewater will propose specific extraction locations for agency consideration. A gravel extraction plan will then be prepared based on the agencies' recommendations for extraction areas. Procedure for gravel extraction will be outlined in the extraction plan, as well as wetland and riparian vegetation protection measures. An aerial map showing extraction polygons and cross sections will be provided during the pre-extraction site visit. Potential extraction volumes and methods will be based on geomorphic and sensitive habitat features (e.g. avoiding riparian vegetation). The site-specific considerations will be based on the result of fisheries habitat delineations and bar replenishment that will be identified during the pre-extraction planning process.

**Proposed Extraction**

Annual gravel operations will be conducted between July 15 and October 15. If an extension is needed, it will be requested from the Corps prior to October 1. Extensions will not go later than November 1. Extensions will be based on whether crossings are used, forecast precipitation, river flow levels, and the presence of adult salmon. All reclamation and restoration activities will be concluded prior to October 15 each year unless an extension is granted. If an extension is granted, the extraction surface will be left each day in a state that will be consistent with a finished extraction surface (e.g., free draining and no stockpiles). A post-extraction survey of physical and biological conditions in the extraction locations will be conducted prior to November 1 each year. Post-extraction surveys will be submitted to all agencies by December 31. Extraction polygon size and volume will not deviate from pre-extraction proposal by more than 10%.

The type of equipment that may be used to excavate and transport gravel includes, but is not limited to, scrapers, excavators, bulldozers, loaders, and off-road and on-road dump trucks. All vehicles and equipment used in the mining operation will be properly cleaned prior to mining, and properly maintained to minimize the possibility of spills or leaks. Refueling activities will take place in the gravel processing yard. Gravel excavated from the bar will be transported to an offsite processing facility.

Access to these sites may require the installation, use and removal of up to three temporary stream crossings (bridges or culverts) per year. As described in greater detail below, crossings will be designed to reduce the amount of turbidity and sediment released due to construction, use, and removal of bridges and/or culverts.

**Stream Crossings**
The following measures will be employed to the extent feasible to ensure that impacts to aquatic resources from sediment-related inputs will be minimized during construction, use, and removal of the stream crossings. Washed native gravels that are within the range of suitable spawning size for salmonids will be used for bridge approaches and abutments. Hand crews will be used where possible instead of equipment to install and remove these crossing materials. Concrete blocks will be used for temporary abutments to minimize the amount of native gravel required for crossings, and will be removed along with the bridge deck immediately after extraction is complete. These abutments will be constructed in conjunction with the installation of erosion control fabrics and fencing which will minimize fine sediment inputs to the Smith River. Haul routes near the stream and the crossing locations will be identified to minimize the accidental disturbance of fish habitat above and below the stream crossing location. Erosion control blanketing will be installed along all disturbed areas adjacent to the stream crossings so that sloughing of loose materials into the stream is minimized. This practice will be conducted adjacent to both wet and dry channels to prevent the accumulation of fine materials in the dry bed that would be delivered to the stream channel. Heavy equipment crossings of the stream channel will be restricted to two complete passes per bridge when installing and removing bridge deck and concrete block abutments.

**Extraction Methods**
Extraction techniques will include alcove extractions, upstream alcoves, narrow skim, inboard skims, shallow horseshoe extractions, floodplain extractions, and secondary channel skims. The preferred method of extraction will be determined each year during preparation of the annual gravel extraction plan. Although gravel will not be mined in the wetted channel, extraction of areas connected to the wetted channel may take place briefly for habitat enhancement and/or restorative purposes, such as connecting an alcove to the Smith River. All extractions will be designed to be free draining to reduce fish stranding potential.

Potential impacts to riparian vegetation from all extraction activities will be minimized to the maximum extent feasible. Unavoidable impacts to riparian vegetation will be mapped and fully quantified for mitigation purposes. Mitigation amounts and location will be identified annually during the pre-extraction planning process with the Corps and NMFS if vegetation is removed and mitigation is required.

The following types of extraction methods are included in the proposed action:

*Alcove Extraction*
Alcove extractions are located at the downstream end of gravel bars where naturally occurring features provide velocity and thermal refuge. Alcove extractions may be irregularly shaped to avoid disturbance to riparian vegetation and are connected to the low-flow channel at the downstream end to avoid stranding juvenile and adult salmonids as river flows rise and fall. Alcoves may be extracted to depths above or below the water table. Large woody debris or large boulders may be placed within alcoves to provide cover for rearing juveniles and resting adult salmonids. Woody vegetation, such as willows, may also be planted on the edges of the alcoves

to enhance cover for salmonids. The downstream end of the extraction will be connected after all fines settle-out to minimize discharge to the Smith River.

*Upstream Alcove*
An upstream alcove may be proposed as an experimental extraction methodology on the Sultan Bar. This alcove will be located at the upstream end of the Sultan Bar. The base elevation at the upstream end of the extraction will be at or below the low flow water surface. The excavation will have its centerline situated along the longitudinal midpoint of the bar and would be no more than one-third of the bar in width. Edge-of-water buffers will be established which will equal one-third of the bar width. The extraction will progress downstream on a flat slope and end at the highest point on the bar, but in no case extend into the downstream half of the bar. The extraction will be opened to the river once fines settle and turbidity clears.

*Narrow Skim*
A narrow skim is an extraction adjacent to the low flow channel with a width no greater than one-third of the unvegetated, exposed bar width. A narrow skim follows the shape of the bar feature, trends in the general direction of stream flow, and would not be located adjacent to riffle habitat. The narrow skim would maintain a minimum vertical offset corresponding to the discharge at the 35 percent exceedance level. The finished narrow skim will be free draining and slope either toward the low-flow channel or in a downstream direction. The narrow skim will avoid the head of the bar, defined as the upstream one-third of the exposed bar surface, however, the head-of-bar buffer may be increased or decreased on a case-by-case basis provided the extraction area narrows, tapering smoothly to a point and remains below the upstream cross-over riffle and would protect the bar morphology.

*Inboard Skim*
This method is similar to the horseshoe except that it maintains a wider horizontal offset from the low flow channel where warranted. These areas would be excavated to a depth no lower than the 35% exceedance flow elevation, with a 0.5 percent cross slope, steeper (1:1) slopes on the sides, and gentle (10:1) slopes at the head of the excavation. The horizontal and vertical offsets are intended to remove the excavation area away from zones of frequent flow inundation. The excavation may extend into the upper one- third of the head-of-bar buffer if sufficient rationale is provided to show that bar morphology would be maintained following high flows.

*Shallow Horseshoe Extraction*
Horseshoe extractions typically involve removing material from the downstream 2/3 interior portion of a bar. Large horizontal and vertical buffers are maintained along the low-flow channel adjacent to horseshoe extractions. To avoid head-cutting, sidewall extraction slopes will be at least 6:1. The depths of extractions are typically extracted to the 35 percent exceedance flow elevation but may go as deep as the water table. The thirty-five percent exceedance flow is determined at USGS gauging station #11532500, when the gauge reads 2,900 CFS.

*Floodplain Extractions*
Floodplain extractions are extractions designed to promote riparian vegetation growth through the removal of gravel which will allow natural vegetation colonization of the extracted surface because roots will be able to reach water during the dry summer months. Floodplain extractions

will be typically located on higher flood terrace surfaces above the annual flood inundation level. They will be located below the one-third head of bar buffer and not exceed one-third of the un-vegetated bar width. Gravel will be removed from the extraction at a depth that intersects the water table, but does not promote exposed water all year. The finished extraction surface will be loosened so that roots can easily penetrate the extraction surface and reach sufficient water for growth.

*Secondary Channel Extractions*
Secondary channel extraction occur in high flow channels. The extraction width will be restricted to the existing size of the secondary channel and the extraction surface floor will be at the 35% exceedance level. The extraction will not encroach into the one-third head of bar buffer. The extraction will be designed to provide a natural downstream grade and will be devoid of depressions that may strand fish. The downstream end will be connected at grade to natural features that freely drain to the Smith River or to the Smith River itself.

**Mitigation Opportunities**
Mitigation may include two recovery actions detailed in the Final SONCC Coho Salmon Recovery Plan (NMFS 2014). The proposed recovery actions include adding large woody debris, boulders or other instream structure and construction of off-channel habitats, alcoves, backwater habitat, and oxbows. Mitigation opportunities will be discussed annually during pre-extraction planning process, and confirmed by NMFS, the Corps, and Tidewater.

# 2. ENDANGERED SPECIES ACT: BIOLOGICAL OPINION AND INCIDENTAL TAKE STATEMENT

The ESA establishes a national program for conserving threatened and endangered species of fish, wildlife, plants, and the habitat upon which they depend. As required by section 7(a)(2) of the ESA, each Federal agency must ensure that its actions are not likely to jeopardize the continued existence of endangered or threatened species, or adversely modify or destroy their designated critical habitat. Per the requirements of the ESA, Federal action agencies consult with NMFS and section 7(b)(3) requires that, at the conclusion of consultation, NMFS provides an opinion stating how the agency's actions would affect listed species and their critical habitats. If incidental take is reasonably certain to occur, section 7(b)(4) requires NMFS to provide an ITS that specifies the impact of any incidental taking and includes non-discretionary reasonable and prudent measures (RPMs) and terms and conditions to minimize such impacts.

## 2.1 Analytical Approach

This biological opinion includes both a jeopardy analysis and/or an adverse modification analysis. The jeopardy analysis relies upon the regulatory definition of "to jeopardize the continued existence of" a listed species, which is "to engage in an action that would be expected, directly or indirectly, to reduce appreciably the likelihood of both the survival and recovery of a listed species in the wild by reducing the reproduction, numbers, or distribution of that species" (50 CFR 402.02). Therefore, the jeopardy analysis considers both survival and recovery of the species.

This biological opinion relies on the definition of "destruction or adverse modification," which "means a direct or indirect alteration that appreciably diminishes the value of critical habitat as a whole for the conservation of a listed species" (50 CFR 402.02).

The designation of critical habitat for SONCC coho salmon uses the term primary constituent element (PCE) or essential features. The 2016 critical habitat regulations (50 CFR 424.12) replaced this term with physical or biological features (PBFs). The shift in terminology does not change the approach used in conducting a ''destruction or adverse modification'' analysis, which is the same regardless of whether the original designation identified PCEs, PBFs, or essential features. In this biological opinion, we use the term PBF to mean PCE or essential feature, as appropriate for the specific critical habitat.

The 2019 regulations define effects of the action using the term "consequences" (50 CFR 402.02). As explained in the preamble to the regulations (84 FR 44977), that definition does not change the scope of our analysis and in this opinion we use the terms "effects" and "consequences" interchangeably.

We use the following approach to determine whether a proposed action is likely to jeopardize listed species or destroy or adversely modify critical habitat:

- Evaluate the rangewide status of the species and critical habitat expected to be adversely affected by the proposed action.
- Evaluate the environmental baseline of the species and critical habitat.
- Evaluate the effects of the proposed action on species and their habitat using an exposure-response approach.
- Evaluate cumulative effects.
- In the integration and synthesis, add the effects of the action and cumulative effects to the environmental baseline, and, in light of the status of the species and critical habitat, analyze whether the proposed action is likely to: (1) directly or indirectly reduce appreciably the likelihood of both the survival and recovery of a listed species in the wild by reducing the reproduction, numbers, or distribution of that species, or (2) directly or indirectly result in an alteration that appreciably diminishes the value of critical habitat as a whole for the conservation of a listed species.
- If necessary, suggest a reasonable and prudent alternative to the proposed action

## 2.2 Rangewide Status of the Species and Critical Habitat

This opinion examines the status of SONCC coho salmon that would be adversely affected by the proposed action. The status is determined by the level of extinction risk that the listed species face, based on parameters considered in documents such as recovery plans, status reviews, and listing decisions. This informs the description of the species' likelihood of both survival and recovery. The species status section also helps to inform the description of the species' current "reproduction, numbers, or distribution" as described in 50 CFR 402.02. The opinion also examines the condition of critical habitat throughout the designated area, evaluates the conservation value of the various watersheds and coastal and marine environments that make up the designated area, and discusses the current function of the essential PBFs that help to form that conservation value.

### 2.2.1 SONCC Coho Salmon

Coho salmon have a generally simple 3-year life history. The adults typically migrate from the ocean and into bays and estuaries towards their freshwater spawning grounds in late summer and fall, and spawn by mid-winter. Adults die after spawning. The eggs are buried in nests, called redds, in the rivers and streams where the adults spawn. The eggs incubate in the gravel until fish hatch and emerge from the gravel the following spring as fry. These 0+ age fish typically rear in freshwater for about 15 months before migrating to the ocean. The juveniles go through a physiological change during the transition from fresh to salt water called smoltification. Coho salmon typically rear in the ocean for two growing seasons, returning to their natal streams as 3-year old fish to renew the cycle.

In this biological opinion, NMFS assesses four population viability parameters to help us understand the status of each species and their ability to survive and recover. These population viability parameters are: abundance, population productivity, spatial structure, and diversity (McElhany et al. 2000). While there is insufficient information to evaluate these population viability parameters in a thorough quantitative sense, NMFS has used existing information, including the Recovery Plan for SONCC Coho Salmon (NMFS 2014) to determine the general condition of each population and factors responsible for the current status of the SONCC coho salmon ESU. We use these population viability parameters as surrogates for numbers, reproduction, and distribution, the criteria found within the regulatory definition of jeopardy (50 CFR 402.20).

*SONCC Coho Salmon Abundance and Productivity:* Although long-term data on coho salmon abundance are scarce, the available evidence from short-term research and monitoring efforts indicate that spawner abundance has declined since the last status review for populations in this ESU (Williams et al. 2016). In fact, most of the 30 independent populations in the ESU are at high risk of extinction because they are below or likely below their depensation threshold, which can be thought of as the minimum number of adults needed for survival of a population.

*SONCC Coho Salmon Spatial Structure and Diversity:* The distribution of SONCC coho salmon within the ESU is reduced and fragmented, as evidenced by an increasing number of previously occupied streams from which SONCC coho salmon are now absent (Good et al. 2005, Williams et al. 2011, and Williams et al. 2016). Extant populations can still be found in all major river basins within the ESU (70 FR 37160). However, extirpations, loss of brood years, and sharp declines in abundance (in some cases to zero) of SONCC coho salmon in several streams throughout the ESU indicate that the SONCC coho salmon's spatial structure is more fragmented at the population-level than at the ESU scale. The genetic and life history diversity of populations of SONCC coho salmon is likely very low and is inadequate to contribute to a viable ESU, given the significant reductions in abundance and distribution.

### 2.2.2 SONCC Coho Salmon Critical Habitat Status

The condition of SONCC coho salmon critical habitat, specifically its ability to provide for conservation, has been degraded from conditions known to support viable salmonid populations. NMFS has determined that currently depressed population conditions are, in part, the result of the following human induced factors affecting critical habitat: overfishing, artificial propagation,

logging, agriculture, mining, urbanization, stream channelization, dams, wetland loss, and water withdrawals (including unscreened diversions for irrigation). Impacts of concern include altered stream bank and channel morphology, elevated water temperature, lost spawning and rearing habitat, habitat fragmentation, impaired gravel and wood recruitment from upstream sources, degraded water quality, lost riparian vegetation, and increased erosion into streams from upland areas (Weitkamp et al. 1995, 64 FR 24049, 70 FR 37160, 70 FR 52488). Diversion and storage of river and stream flow has dramatically altered the natural hydrologic cycle in many of the streams within the ESU. Altered flow regimes can delay or preclude migration, dewater aquatic habitat, and strand fish in disconnected pools, while unscreened diversions can entrain juvenile fish.

Factors Responsible for the Decline of Species and Degradation of Critical Habitat

The factors that caused declines include hatchery practices, ocean conditions, habitat loss due to dam building, degradation of freshwater habitats due to a variety of agricultural and forestry practices, water diversions, urbanization, over-fishing, mining, climate change, and severe flood events exacerbated by land use practices (Good et al. 2005, Williams et al. 2016). Sedimentation and loss of spawning gravels associated with poor forestry practices and road building are particularly chronic problems that can reduce the productivity of salmonid populations. Late 1980s and early 1990s droughts and unfavorable ocean conditions were identified as further likely causes of decreased abundance of SONCC coho salmon (Good et al. 2005). From 2014 through 2016, the drought in California reduced stream flows and increased temperatures, further exacerbating stress and disease. Ocean conditions have been unfavorable in recent years (2014 to present) due to the El Nino in 2015 and 2016. Reduced flows can cause increases in water temperature, resulting in increased heat stress to fish and thermal barriers to migration.

One factor affecting the range wide status and aquatic habitat at large is climate change. Information since this species were listed suggests that the earth's climate is warming, and that this change could significantly impact ocean and freshwater habitat conditions, which affect survival of coho salmon subject to this consultation. In the coming years, climate change will influence the ability to recover coho salmon in most or all of their watersheds. Coho salmon is particularly vulnerable to climate change due to their need for year-round cool water temperatures (Moyle 2002). Through effects on air temperatures and stream flows, climate change is expected to increase water temperatures to the detriment of coho salmon. Climate change effects on stream temperatures within Northern California are already apparent. For example, in the Klamath River, Bartholow (2005) observed a 0.5°C per decade increase in water temperature since the early 1960's, and model simulations predict a further increase of 1-2°C over the next 50 years (Perry *et al.* 2011).

In coastal and estuarine ecosystems, the threats from climate change largely come in the form of sea level rise and the loss of coastal wetlands. Sea levels will likely rise exponentially over the next 100 years, with possibly a 43 to 84 cm rise by the end of the 21st century (IPCC 2019). This rise in sea level will alter the habitat in estuaries and either provide increased opportunity for feeding and growth or in some cases will lead to the loss of estuarine habitat and a decreased potential for estuarine rearing. Marine ecosystems face an entirely unique set of stressors related to global climate change, all of which may have deleterious impacts on growth and survival while at sea. In general, the effects of changing climate on marine ecosystems are not well

understood given the high degree of complexity and the overlapping climatic shifts that are already in place (*e.g.*, El Niño, La Niña, and Pacific Decadal Oscillation) and will interact with global climate changes in unknown and unpredictable ways. Overall, climate change is believed to represent a growing threat, and will challenge the resilience of coho salmon in Northern California.

## 2.3 Action Area

"Action area" means all areas to be affected directly or indirectly by the Federal action and not merely the immediate area involved in the action (50 CFR 402.02).

The action area affected by the proposed action includes the upstream extent of the Sultan Bar in the Smith River mainstem downstream approximately 7 miles to the mouth of the Smith River. Most of the effects will be confined to the active channel of the Smith River immediately adjacent to the mining operations on the Huffman and Sultan bars. However, since sediment will be removed from the active channel of the Smith River, we expect that sediment transport and dynamic equilibrium could be affected in the Smith River from the mining locations to where the Smith River enters the Pacific Ocean. This section of the Smith River is in a partially unconfined, alluvial reach which promotes gravel deposition and bar formation. The lateral extent of the action area includes the active river channel, the floodplain, and the contemporary river meander belt.

## 2.3 Environmental Baseline

The "environmental baseline" refers to the condition of the listed species or its designated critical habitat in the action area, without the consequences to the listed species or designated critical habitat caused by the proposed action. The environmental baseline includes the past and present impacts of all Federal, State, or private actions and other human activities in the action area, the anticipated impacts of all proposed Federal projects in the action area that have already undergone formal or early section 7 consultations, and the impact of State or private actions which are contemporaneous with the consultation in process. The consequences to listed species or designated critical habitat from ongoing agency activities or existing agency facilities that are not within the agency's discretion to modify are part of the environmental baseline (50 CFR 402.02).

In the action area, the threat to SONCC coho salmon from climate change is likely to include a continued increase in average summer air temperatures; more extreme heat waves; and an increased frequency of drought (Lindley et al. 2007). In future years and decades, many of these changes are likely to further degrade habitat throughout the Smith River watershed by, for example, reducing streamflow during the summer and raising summer water temperatures. However, due to the large areas of intact forest in the Smith River watershed and public land restrictions on timber harvest and other habitat degrading activities, the action area should be somewhat buffered by the effects of climate change. Therefore, the critical habitat in the action area has a very high conservation value for coho salmon into the future.

### 2.3.1 Status of Listed Species and Critical Habitat in the Action Area

Coho salmon occurring in the action area belong to the Smith River population of SONCC coho salmon. The Smith River population of SONCC coho salmon is considered a core population and likely very close to their depensation threshold of 325 adults (NMFS 2014, 2016), which can be thought of as the number of spawners needed for survival of the population. The estimated number of coho salmon in the Smith River that currently may spawn each year is 355 based on 2-years of redd data (NMFS 2016). This is an estimate based on only two-years of data, but is consistent with past estimates and suggests a low, but stable population. The vast majority of coho salmon in the Smith River are found in Mill Creek, which is upstream of the Action Area.

Critical habitat within the Smith River ranges from excellent to poor. The key limiting stresses for the Smith River population are impaired estuary/mainstem function and lack of floodplain and channel structure, as they have the greatest impact on the population's ability to produce sufficient spawners to support recovery (NMFS 2014). The juvenile life stage is most limited, primarily due to a lack of access to, and decrease in the quantity of high quality winter (NMFS 2014) and summer rearing habitat, and the estuarine rearing life history trait historically found in the population is limited by the degraded conditions in the Smith River estuary. A paucity of large woody debris (LWD) in the action area limits the quality of habitat and is regularly removed by landowners and trespassers when it does recruit. LWD is regularly removed from the Huffman Bar because its morphology promotes LWD recruitment and public access is available. Although habitat quality in the middle and upper parts of the basin have not been heavily impacted by land use, many areas in the lower parts of the Smith River and the Smith River estuary are creating limitations on the survival and viability of the Smith River coho salmon population. Additionally, the high pesticide use associated with lily bulb agriculture in the Smith River Plain adjacent to streams and drainages that enter the Smith River estuary are affecting the survival of coho salmon (NMFS and CDFW 2018). NMFS expects that new regulations on lily bulb farming to reduce pesticide use and run-off will reduce the risks to coho salmon and their critical habitat.

Of particular importance are the five tributaries to the Smith River that flow into the estuary: Rowdy Creek, Ritmer Creek, Delilah Creek, Yontocket Slough, and Morrison Creek. Additionally, a number of unnamed drainages, sloughs, and backwaters that have water in the winter provide non-natal habitat for coho salmon, or would provide habitat if accessible and having adequate water quality. These tributaries and sloughs near the estuary provide vital habitat for juveniles and fry that may be swept downstream during high flow events. This habitat increases survival of juveniles, which increases overall productivity and life history diversity of this population. The juveniles in these streams may express an estuarine life history pattern for rearing. Given the high flows and steep conditions found in the middle and upper Smith River watershed, low gradient tributaries near the estuary likely contribute to the success and continued survival of coho salmon in the Smith River. The lower Smith River and its tributaries are critical to the recovery of coho salmon in the Smith River (NMFS 2014). Therefore, the continued degradation of these habitats primarily from poor agricultural practices has a large impact on the entire population.

Further upstream, refugial areas with good water quality are likely to be available in most cases, but are not always accessible or usable due to high gradients and barriers. These most likely occur where cold, clean water comes in from tributaries and where groundwater emerges into the stream. The habitat in the estuary and its tributaries within the Smith River Plain is poor with most of the streams affected by agriculture including the existence of pesticide contamination from lily bulb agriculture (NMFS and CDFW 2018). Other impacts from agriculture include diversions, fish passage barriers, and a paucity of functioning riparian conditions along tributary streams and the mainstem Smith River due to channelization and simplification.

The Smith River is expected to be more resilient than other streams to the effects of climate change because much of the land is in public ownership, including Mill Creek where the majority of coho salmon spawn in the Smith River. These public lands are continuing to provide a "stronghold" for coho salmon because they are either recovering from past degradation or have existing characteristics that provide resiliency (*e.g.*, old growth forest and increased promotion of old growth characteristics in Mill Creek). NMFS does not expect the proposed action to exacerbate the effects of climate change on coho salmon and its critical habitat.

## 2.4 Effects of the Action

Under the ESA, "effects of the action" are all consequences to listed species or critical habitat that are caused by the proposed action, including the consequences of other activities that are caused by the proposed action. A consequence is caused by the proposed action if it would not occur but for the proposed action and it is reasonably certain to occur. Effects of the action may occur later in time and may include consequences occurring outside the immediate area involved in the action (see 50 CFR 402.17). In our analysis, which describes the effects of the proposed action, we considered 50 CFR 402.17(a) and (b).

Since a similar proposed action has been implemented in the action area for at least the last 20 years, NMFS assumes that the effects of this proposed action will be similar to that observed during these past actions.

### 2.4.1 Insignificant or Discountable Effects

The proposed gravel extraction operations on the Huffman and Sultan Bars are expected to result in the following negligible effects to SONCC coho salmon and their critical habitat. These impacts include:
(1) Noise, motion, and vibration disturbance from equipment operation;
(2) Chemical contamination from equipment fluids;
(3) Effects to riparian vegetation;
(4) Increased sediment and turbidity.

Noise, motion, and vibration produced by heavy equipment operation within the vicinity of the wetted channel may disrupt rearing juvenile coho salmon at all gravel mining sites. However, any mining would occur on the gravel bar and not within the wetted channel so disturbance from heavy equipment operation is unlikely. While stream crossing construction could disturb rearing juvenile coho salmon, they will not be located in pools, near overhanging vegetation, or near

instream large woody debris, which are typically where rearing juvenile coho salmon are found. Adult coho salmon will not be present when mining is expected to occur.

All operations use equipment powered by diesel fuel and lubricated by other petroleum products that are hazardous to coho salmon. However, all fuel filling will be done far away from the river and gravel bar in the gravel processing facility so large volumes of chemicals that could reach the river are not expected. Additionally, all machinery will be inspected and cleaned before use on the bars. Only small amounts of hazardous fluids are likely to leak, if at all, and are not expected to be delivered to the wetted channel except during high flow events. Any small amounts of fluids (i.e., drips) that may miss detection on the gravel bar are expected to be highly diluted due to the high flow volumes that would inundate the gravel bar and come in contact with these small amounts of chemicals. Therefore, any effects to coho salmon or their critical habitat from chemical leaks are expected to be minor because the amounts will be small and unlikely to be in contact with the water except when dilution is high.

Impacts to riparian vegetation from gravel mining on the Huffman and Sultan bars did not occur during 2010 to 2019 (Figures 1 and 2). This proposed action is expected to be similar with no negative effects to riparian vegetation because riparian vegetation will be avoided during extraction operations. Long-standing access roads currently occur on the Huffman Bar where vegetation is suppressed by vehicle and large equipment use. This proposed action includes floodplain extractions and planting opportunities that can be used to promote additional riparian vegetation. Therefore, adverse effects to riparian vegetation from this proposed action are not expected.

Gravel extraction and bridge construction loosens surface material, reduces surface particle size, and changes channel form, which may result in increased erosion of bars and banks and elevated turbidity and sedimentation when disturbed areas become inundated. Increased turbidity and sedimentation could interfere with respiration, reduce feeding success, and displace any listed salmonids present. Increased sedimentation reduces the interstitial spaces of substrate, and decreases the habitable area for aquatic invertebrates, an important food source for juvenile salmonids (Bjornn et al. 1977). In-stream equipment operations located within the wetted channel during bridge construction are likely to cause short-term increases in turbidity during periods of low flow. However, based on the measures proposed to reduce sediment introduction, we expect the effects of sediment from the proposed action to be negligible.

Elevated sediment entrainment and deposition reduces benthic macro-invertebrate (food) by reducing primary productivity, thereby hindering feeding opportunity for exposed juvenile coho salmon. In addition, suspended material will result in increased turbidity, potentially making salmonid prey and predator detection difficult. A minimum skim floor elevation at the 35 percent exceedance flow will provide confinement of the low flow channel until the stream is transporting high levels of suspended sediment such that additional sediment coming off extraction surfaces is relatively minor (NMFS 2002). The sediment and turbidity levels in the action area are lower than most California coastal rivers because the geology is more stable and consolidated. Therefore, coho salmon that are responding to higher than baseline suspended sediment and turbidity levels during flows that inundate extraction surfaces are unlikely to be

affected by the minor increases in sediment and turbidity from the proposed project. Therefore, exposure to increased turbidity and sedimentation as a result of extraction activities above the 35 percent flow elevation are not expected to affect respiration, feeding success, and will not result in displacement of coho salmon in the action area.

Channel crossing construction and removal methods employ measures aimed to minimize the amount of fine sediment delivery and associated turbidity. These measures include: (1) Using washed spawning-sized gravel for approaches and abutments, (2) using hand crews instead of heavy equipment, where possible, (3) using concrete blocks for abutments to minimize gravel use, (4) using erosion control fabrics and fencing to minimize sediment reaching the Smith river, (5) using erosion control blanketing to minimize sloughing of sediment into the channel during use, and (6) limiting heavy equipment crossings of the channel to two times per bridge installation and removal. Implementation of these measures is expected to reduce the potential effects of sediment in the channel to a spatially-limited, temporary decrease in invertebrates in the Smith River within 100 feet of the crossing. Since the location of the crossings will be outside the preferred location for juvenile coho salmon and food is unlikely to be limiting juvenile coho salmon feeding opportunities in the Smith River, this small, short-term decrease in the invertebrate population is expected to be minor. A small number of invertebrates may be crushed by the crossing of the stream by heavy equipment, but these areas are expected to be rapidly recolonized and be confined in size to the width of the machinery tires. Therefore, the amount of food that might be lost due to crushing by heavy equipment is expected to be minor for coho salmon and their designated critical habitat.

### 2.4.2 Potential Effects of Gravel Mining on Coho Salmon and Their Habitat

Potential impacts from gravel mining on fish habitat are well documented (*e.g.,* Pauley et al.1989, Brown et al. 1998). Gravel mining may modify the geomorphic features and flow hydraulics at a bar-unit, and impacts may cascade to a larger reach scale. This changes local salmon habitat quality and quantity, potentially affecting individual SONCC coho salmon. For example, Brown et al. (1998) compared mined sites to reference reaches in gravel bed streams and found that total fish densities in pools were higher in reference reaches than in mined sites and reaches farther downstream. They also found bankfull channel widths were significantly increased at mined sites, and distance between riffles increased, resulting in fewer pools in reaches downstream of mined sites. Biomass and densities of invertebrates were higher in reference reaches. In addition, Pauley et al. (1989) observed changes in channel form and resultant impacts to habitat function from skimming, including: (1) decreased channel confinement, with widening and shallowing of the low flow channel and decreased water depths over riffles, which created migration barriers; (2) obliteration of side channels with complex habitat, resulting in reduced habitat for salmonids; and (3) channel instability at the top of skimmed bars, with an increase in the probability of redd scour.

Based on monitoring of the mining area and the action area during implementation of past gravel mining of the Huffman Bar in the action area (e.g., Figures 1 and 2), the larger scale changes to the bar and reach scale morphology that could result in poorer coho salmon habitat quality described above are not expected. The Sultan Bar was only mined one time over the last permit period and no long-term morphological changes occurred there, either. The reason these changes are not expected are because restrictions on sediment removal volumes, implementation of head-of-bar buffers and extraction widths, restricting the skim depth elevation to the 35% exceedance

flow, restricting excavation to the dry bar, and avoidance of riparian vegetation promotes maintenance of the existing bar morphology. Additionally, the existing mining reach bar morphology is maintained by the confined valley width and the existence of bedrock controls adjacent to the mined bars.

### 2.4.3 Exposure

Coho salmon use the action area for adult migration and holding and juvenile rearing and migration. Spawning of adult coho salmon does not occur in the action area. Direct effects from the proposed action are not expected. That is, coho salmon will not be directly affected by the physical removal of the gravel during the time it is being removed or any other activities associated with the proposed action. Coho salmon juveniles may be injured or killed by the morphological change in the bar surface following sediment removal. These morphological changes include: (1) the removal of the larger cobbles and small boulders from the bar surface resulting in a temporary decrease in the size of substrate on the bar surface and (2) creation of areas on the bar surface that may strand juvenile coho salmon if incomplete sediment replenishment occurs and inescapable voids are left on the bar's surface.

Beneficial effects from the action may include the creation of temporary juvenile rearing areas from excavation of the downstream alcove on the Huffman Bar. This alcove has held juvenile coho salmon in the past that seek out the warmer, less swift waters in the alcove, which promotes faster growth of juvenile coho salmon. Additional alcove opportunities may be available for the Sultan Bar, but have not been implemented in the past. In addition, bar skimming may create more edge water habitat for fry that originate from upstream tributaries during some flows when the extraction surface is inundated. Finally, the skimming of overflow channels and connecting downstream areas to upstream areas so that they freely drain may increase the likelihood that juveniles using the bar surface for rearing are able to safely migrate back to the mainstem Smith River once flows recede. Mitigation in the form of floodplain extractions for riparian enhancement or the addition of large woody debris have not been implemented previously on the Huffman or Sultan Bars, but these opportunities will be explored during implementation of this action.

The effects of climate change on coho salmon individuals are not expected to be exacerbated by the proposed action.

### 2.4.4 Response

Juvenile coho salmon that encounter the temporary morphological changes on the extracted bar surfaces, including small substrate size, may be more concentrated where substrate provides adequate velocity refugia and sheltering/rearing. This will increase the competition for resources, including food, which may decrease growth rates. This lower growth potential may result in a reduced size at ocean entry and consequent reduced survival because of increased predation risk and incomplete smoltification. Increased competition for adequate substrate shelter between coho salmon individuals may also result in increased foraging or individuals may be forced into less suitable habitats for feeding and sheltering which may increase vulnerability to predation. In addition, there may be increased predation while in the river if adequate sheltering isn't

available. Voids on the bar surface that may form due to incomplete replenishment of extractions may capture juvenile coho salmon if pathways back to the main Smith River channel dry before coho salmon leave these areas.

**Figure 1**. Aerial photo of the Huffman Bar in 2011

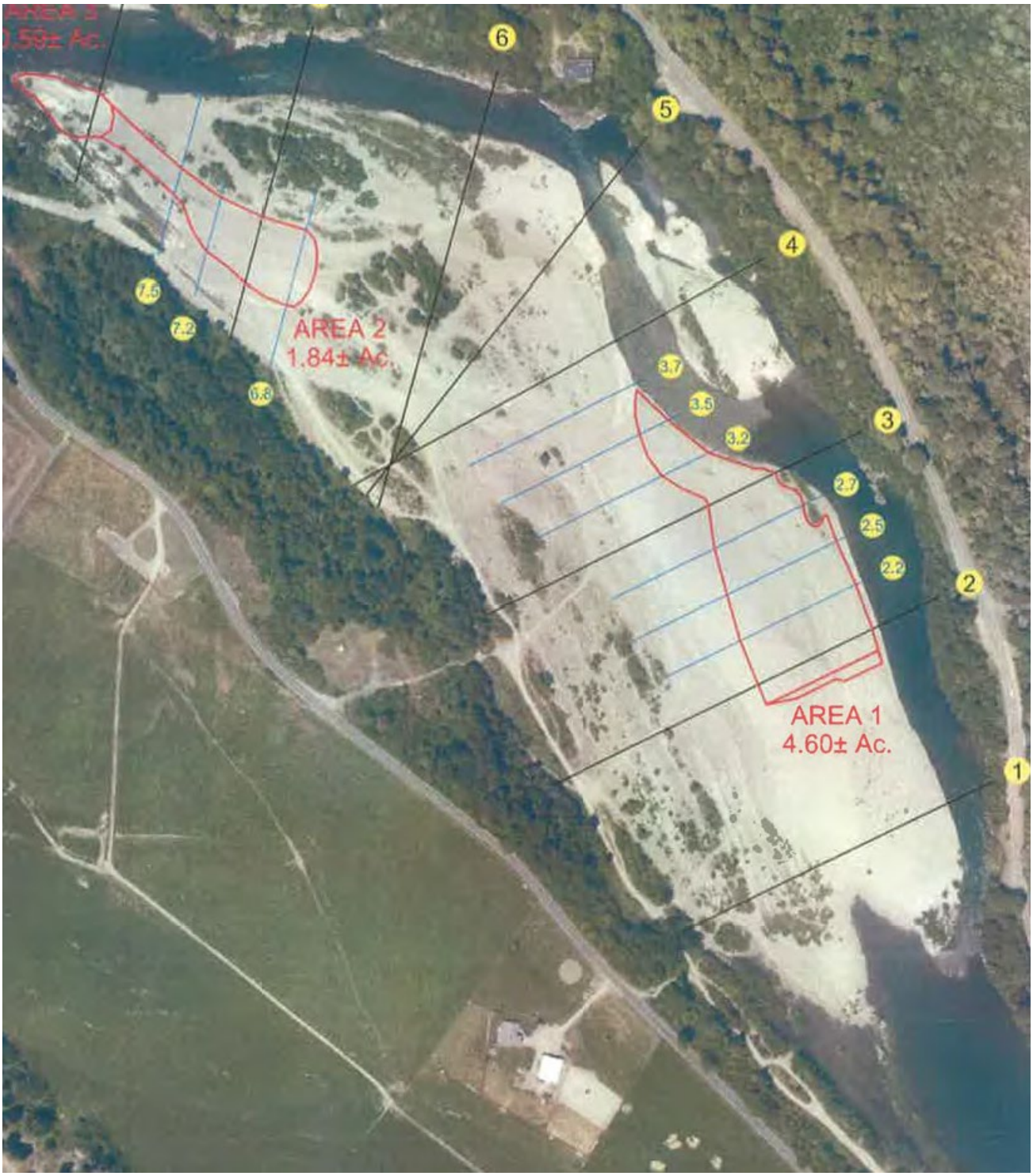
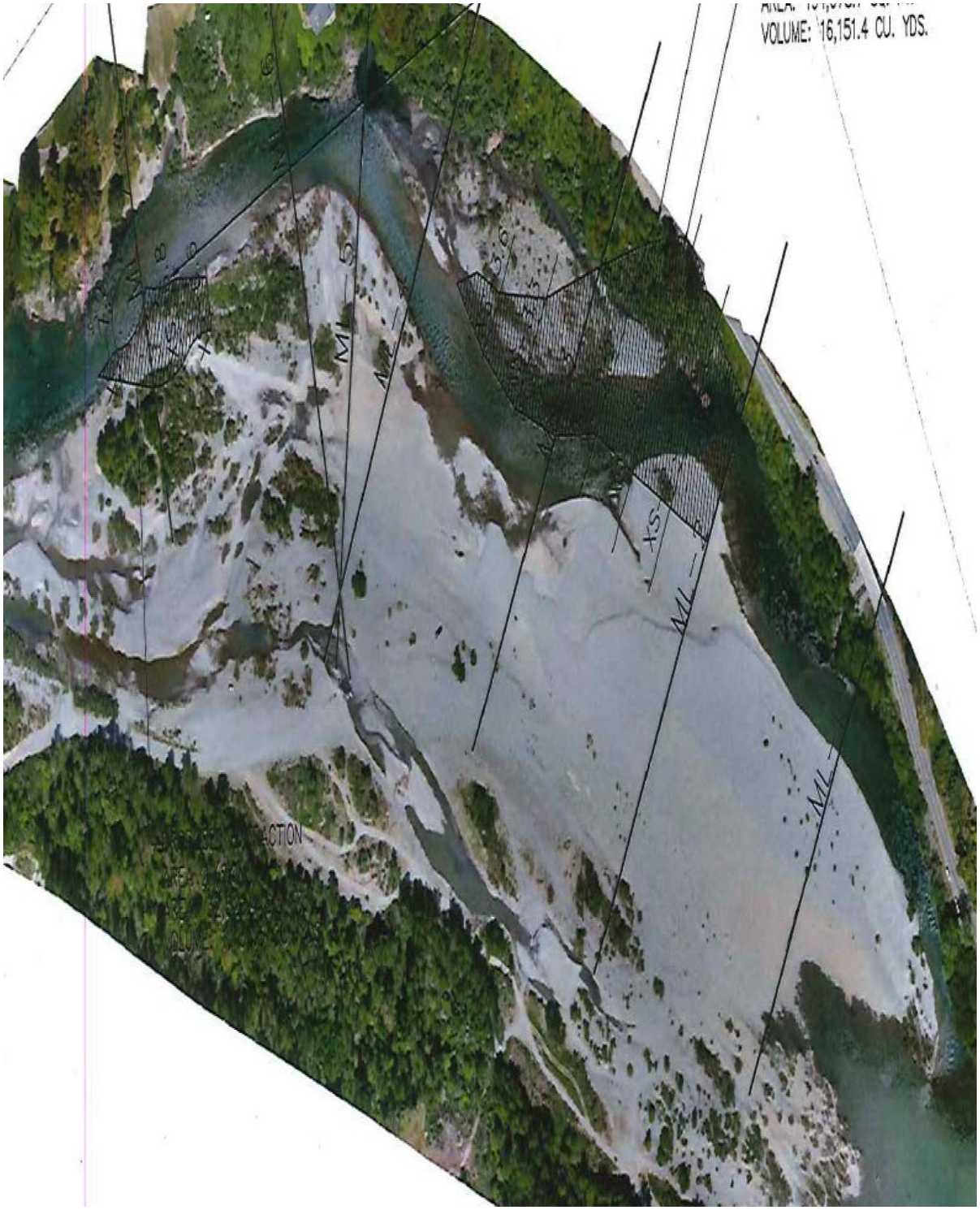


**Figure 2**. Aerial photo of the Huffman Bar in 2019



### 2.4.5 Effects to Critical Habitat

NMFS expects only minor effects to critical habitat primarily at the location where the gravel removal occurs. Some long-term reductions in riparian vegetation is associated with long-standing roads used to access the gravel bars for extraction purposes. However, new access roads that impact riparian vegetation will not be constructed. These roads do provide access to trespassers who remove large woody debris from the gravel bars. Long-term removal of large woody debris from the Smith River, coupled with below average recruitment rates for new large woody debris because of past logging of riparian zones has resulted in a paucity of wood in the Smith River and consequently a decrease in the habitat quality. Large woody debris that may accumulate on the Huffman Bar could provide an increase in habitat quality in the action area, but removal by trespassers reduces this potential.

As discussed above, short-term effects to juvenile coho salmon sheltering and rearing are expected when removal of the armor layer (large cobbles and boulders) results in a smaller substrate when first inundated as winter flows increase. However, even without full replenishment of the gravel bar surface during winter floods, the natural armor layer is expected to re-form as flows overtop the extracted surface and smaller substrate is winnowed away.

As discussed above, larger scale morphological changes of the Huffman and Sultan Bars are not expected primarily because: 1) extraction sideboards limit the extraction size, volumes, and locations and 2) the Smith River in the action area at the extraction bar locations is morphologically determined by bed rock and the existing bar forms. Similar extractions have occurred in the action area for at least the last 20 years with no measurable change in bar morphology, stream channel, or riparian vegetation due to sediment removal activities (Figure 1 and 2).

Beneficial effects to critical habitat from the proposed action may include the creation of temporary juvenile rearing areas from excavation of the downstream alcove on the Huffman Bar. This alcove has held juvenile coho salmon in the past which seek out the warmer, less swift waters in the alcove which promotes faster growth of juvenile coho salmon. Additional alcove opportunities may be available for the Sultan Bar. In addition, bar skimming may create more edge water rearing habitat for fry during some flows when the extraction surface is inundated. Finally, the skimming of overflow channels and connecting downstream areas to upstream areas so that they freely drain may increase the likelihood that juveniles using the bar surface for rearing are able to safely migrate back to the mainstem Smith River once flows recede. Mitigation in the form of floodplain extractions for riparian enhancement or the addition of large woody debris have not been implemented previously on the Huffman or Sultan Bars, but these opportunities will be explored during implementation of this proposed action and would increase the value of critical habitat in the action area.

## 2.5 Cumulative Effects

"Cumulative effects" are those effects of future state or private activities, not involving Federal activities, that are reasonably certain to occur within the action area of the Federal action subject to consultation (50 CFR 402.02 and 402.17(a)). Future Federal actions that are unrelated to the

proposed action are not considered in this section because they require separate consultation pursuant to section 7 of the ESA.

Some continuing non-Federal activities are reasonably certain to contribute to climate effects within the action area. However, it is difficult if not impossible to distinguish between the action area's future environmental conditions caused by global climate change that are properly part of the environmental baseline *vs.* cumulative effects. Therefore, all relevant future climate-related environmental conditions in the action area are described in the environmental baseline (Section 2.3).

NMFS expects ongoing adverse effects on critical habitat and SONCC coho salmon individuals primarily from agriculture and timber harvest, but also from rural residential activities including diverting water for the town of Smith River, Fort Dick, and Pelican Bay Prison. Agriculture results in sediment, nutrients, and pesticide inputs that are adversely affecting coho salmon and its critical habitat.

## 2.6 Integration and Synthesis

The Integration and Synthesis section is the final step in our assessment of the risk posed to species and critical habitat as a result of implementing the proposed action. In this section, we add the effects of the action (Section 2.4) to the environmental baseline (Section 2.3) and the cumulative effects (Section 2.5), taking into account the status of the species and critical habitat (Section 2.2), to formulate the agency's biological opinion as to whether the proposed action is likely to: (1) Reduce appreciably the likelihood of both the survival and recovery of a listed species in the wild by reducing its numbers, reproduction, or distribution; or (2) appreciably diminishes the value of designated or proposed critical habitat for the conservation of the species.

NMFS has developed a Viable Salmonid Population (VSP) concept which includes the parameters of population abundance, population growth rate, population spatial structure, and population diversity for defining a viable population which is an independent Pacific salmonid population that has a negligible risk of extinction due to threats from demographic variation, local environmental variation, and genetic diversity changes over a 100-year time period. An ESU is typically made up of multiple independent populations. Therefore, NMFS must assess whether changes to VSP parameters of the independent population results in a reduction in the numbers, reproduction, or distribution of the ESU /DPS as a whole.

### 2.6.1 Summary of Baseline, Status of the Species, and Cumulative Effects

The current status of habitat in the action area is improving relative to past conditions that lead to the listing of SONCC coho salmon. Timber harvest practices and road building practices have improved and a number of fish passage projects have been implemented in the Smith River Watershed. The lower Smith River is still affected by the existence of levees. Intense agricultural production in the Smith River Plain will continue to adversely affect non-natal rearing and outmigrant juvenile coho salmon and habitat. NMFS assumes that the productivity of Smith River coho salmon is primarily limited by the current quantity and quality of the salmonid

habitat available in the Smith River Plain and that future improvements to habitat conditions would promote their recovery.

Population monitoring of coho salmon has been limited until recently and NMFS estimates the most recent adult coho salmon population at 355, which is just above the depensation number of 325 (NMFS 2016).

The cumulative effects of those state, private, and tribal activities that occur in the watershed as discussed in the environmental baseline (e.g., timber harvest and agriculture) will continue to impair, but not preclude the recovery of, habitat in the action area. NMFS expects that new regulations in the coming years for lily bulb farming, as well as ongoing improvements in legacy effects of poor timber harvest practices and agricultural and urban development will result in improved habitat conditions for SONCC coho salmon. Additionally, focused recovery actions as identified in the SONCC Coho Salmon Recovery Plan are expected to further improve habitat for coho salmon in the Smith River.

The Smith River is expected to be more resilient than other streams to the effects of climate change because much of the land is in public ownership including Mill Creek where the majority of coho salmon spawn in the Smith River. These public lands are continuing to provide a "stronghold" for coho salmon because they are either recovering from past degradation or have existing characteristics that provide resiliency (e.g., old growth forest and increased promotion of old growth characteristics in Mill Creek). NMFS does not expect the proposed action to exacerbate the effects of climate change on coho salmon and its critical habitat.

### 2.6.2 Summary of Effects to Coho Salmon Individuals

Negligible effects to SONCC coho salmon and their critical habitat will occur from disturbances during the gravel removal and bridge construction operations, chemical contamination, effects to riparian vegetation, and increased sediment and turbidity. The potential adverse effects of the proposed action on SONCC coho salmon are limited to a minor increase in competition and predation from a reduction in substrate size on the bar surfaces following extraction. A small number of coho salmon juveniles may become stranded on extraction surfaces. NMFS does not expect competition and predation or stranding to reduce the number of coho salmon adults that return to the Smith River. Some beneficial effects to coho salmon individuals may increase survival. Since the adult coho salmon population is not expected to be affected, NMFS does not expect any measurable effects on VSP parameters, and, thus, is not expected to reduce the survival and recovery of the SONCC coho salmon ESU.

### 2.6.3 Summary of Effects to Critical Habitat

NMFS has determined that the effects on critical habitat from the proposed action are limited to only short-term effects on the bar substrate where extractions occur. Some beneficial effects on critical habitat would occur with alcove extraction and potential additions of large woody debris and riparian vegetation. Such effects on critical habitat would, therefore, be negligible. Therefore, the proposed action will not destroy or adversely modify designated critical habitat for SONCC coho salmon.

## 2.7 Conclusion

After reviewing and analyzing the current status of the SONCC coho salmon and critical habitat, the environmental baseline within the action area, the effects of the proposed action, any effects of interrelated and interdependent activities, and cumulative effects, it is NMFS' biological opinion that the proposed action is not likely to jeopardize the continued existence of SONCC coho salmon or destroy or adversely modify its designated critical habitat.

## 2.8 Incidental Take Statement

Section 9 of the ESA and Federal regulations pursuant to section 4(d) of the ESA prohibit the take of endangered and threatened species, respectively, without a special exemption. "Take" is defined as to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or to attempt to engage in any such conduct. "Harm" is further defined by regulation to include significant habitat modification or degradation that actually kills or injures fish or wildlife by significantly impairing essential behavioral patterns, including breeding, spawning, rearing, migrating, feeding, or sheltering (50 CFR 222.102). "Incidental take" is defined by regulation as takings that result from, but are not the purpose of, carrying out an otherwise lawful activity conducted by the Federal agency or applicant (50 CFR 402.02). Section 7(b)(4) and section 7(o)(2) provide that taking that is incidental to an otherwise lawful agency action is not considered to be prohibited taking under the ESA if that action is performed in compliance with the terms and conditions of this ITS.

### 2.8.1 Amount or Extent of Take

In the biological opinion, NMFS determined that incidental take is reasonably certain to occur as follows:

NMFS expects that a small number of juvenile coho salmon may be injured or killed because they will not be able to find adequate shelter and feeding locations and may undergo increased predation or stunted growth from increased competition or may be stranded in extraction areas as a result of the proposed action. However, itt is not possible to quantify the amount of individual juvenile coho salmon taken as a result of competition, predation from a reduction in substrate size, or stranding in the action area because it is not possible to meaningfully measure the number of juvenile coho salmon that use the action area during the winter when effects would occur and locating small, dead fish is practically impossible due to predation, decomposition, and poor water visibility.

NMFS has determined that an adequate take surrogate is the planform location of the low flow channel on an annual basis adjacent to the Huffman and Sultan bars. NMFS expects that the location of the low flow channel will not move significantly (*e.g.*, will not abandon its location as noted on the 2019 aerial photos of the Huffman and Sultan bars) because it didn't move within at least the last ten years of mining and this stability in planform is associated with proposed restrictions on mining (e.g., 35% skim floor elevation, avoiding riparian vegetation, only mining on the dry gravel bar surface, head of bar buffers, and limiting skim widths). We assume that changes in the planform location of the low flow channel would result in effects to individual coho salmon from the proposed action that were not considered in this Opinion and take would be exceeded. NMFS will monitor this take surrogate during the annual review process, which

includes a review of each year's spring aerial photos. Additionally, NMFS will use proposed annual extraction volumes for the Huffman (50,000 cubic yards) and Sultan (25,000 cubic yards) as a surrogate for take. If these volumes are exceeded, we assume that take was exceeded.

2.8.2 Effect of the Take

In the biological opinion, NMFS determined that the amount or extent of anticipated take, coupled with other effects of the proposed action, is not likely to result in jeopardy to the species or destruction or adverse modification of critical habitat.

2.8.3 Reasonable and Prudent Measures

"Reasonable and prudent measures" are nondiscretionary measures that are necessary or appropriate to minimize the impact of the amount or extent of incidental take (50 CFR 402.02).

1. Tidewater, Inc. and the Corps will provide NMFS annual air photos, monitoring cross sections of each bar, final pre-extraction plans, and post-extraction reports for the Huffman and Sultan Bars in an electronic format.
2. Tidewater, Inc. will minimize stranding due to off-channel extractions.
3. Tidewater, Inc. will preserve large woody debris that may be recruited to the Huffman Bar.

2.8.4 Terms and Conditions

The terms and conditions described below are non-discretionary, and the Corps or any applicant must comply with them in order to implement the RPMs (50 CFR 402.14). The Corps or any applicant has a continuing duty to monitor the impacts of incidental take and must report the progress of the action and its impact on the species as specified in this ITS (50 CFR 402.14). If the entity to whom a term and condition is directed does not comply with the following terms and conditions, protective coverage for the proposed action would likely lapse.

1. The following terms and conditions implement reasonable and prudent measure 1:

   Tidewater, Inc will provide annual aerial photos and cross sections, pre-extraction plans and final extraction reports to NMFS at:

   1655 Heindon Rd.
   Arcata, CA. 95521

   Annual aerial photos and mining cross sections will be provided prior to the annual pre-extraction review. Pre-extraction plans will be provided at least 14-days prior to mining each season. Post-extraction reports will be provided by December 31 of the extraction year.

2. The following terms and conditions implement reasonable and prudent measure 2:

   Tidewater, Inc will monitor floodplain, alcove, side channel, and inboard skim extractions that may strand coho salmon and will contact NMFS within 24 hours if fish are present once flows decrease and stranding locations become isolated.

3. The following terms and conditions implement reasonable and prudent measure 3:

   Tidewater, Inc. will monitor the Huffman Bar for large woody debris and if large woody debris is found on bar once flows recede, NMFS will be consulted within 7 days regarding the best way to protect the large woody debris from removal.

### 2.9 Conservation Recommendations

Section 7(a)(1) of the ESA directs Federal agencies to use their authorities to further the purposes of the ESA by carrying out conservation programs for the benefit of the threatened and endangered species. Specifically, conservation recommendations are suggestions regarding discretionary measures to minimize or avoid adverse effects of a proposed action on listed species or critical habitat or regarding the development of information (50 CFR 402.02).

NMFS has no additional conservation recommendation regarding this proposed action.

### 2.10 Reinitiation of Consultation

This concludes formal consultation for Gravel Extraction on the Huffman and Sultan Bars in the Smith River for the years 2020-2029.

As 50 CFR 402.16 states, reinitiation of consultation is required and shall be requested by the Federal agency or by the Service where discretionary Federal agency involvement or control over the action has been retained or is authorized by law and if: (1) The amount or extent of incidental taking specified in the ITS is exceeded, (2) new information reveals effects of the agency action that may affect listed species or critical habitat in a manner or to an extent not considered in this opinion, (3) the identified action is subsequently modified in a manner that causes an effect to the listed species or critical habitat that was not considered in the biological opinion, or (4) a new species is listed or critical habitat designated that may be affected by the action.

## 3. MAGNUSON-STEVENS FISHERY CONSERVATION AND MANAGEMENT ACT ESSENTIAL FISH HABITAT RESPONSE

Section 305(b) of the MSA directs Federal agencies to consult with NMFS on all actions or proposed actions that may adversely affect EFH. The MSA (section 3) defines EFH as “those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity.” Adverse effect means any impact that reduces quality or quantity of EFH, and may include direct or indirect physical, chemical, or biological alteration of the waters or substrate and loss of (or injury to) benthic organisms, prey species and their habitat, and other ecosystem components, if such modifications reduce the quality or quantity of EFH. Adverse effects on EFH may result

from actions occurring within EFH or outside of it and may include site-specific or EFH-wide impacts, including individual, cumulative, or synergistic consequences of actions (50 CFR 600.810). Section 305(b) also requires NMFS to recommend measures that can be taken by the action agency to conserve EFH.

This analysis is based, in part, on the EFH assessment provided by the Corps and descriptions of EFH for Pacific Coast salmon (PFMC 2014) contained in the fishery management plans developed by the PFMC and approved by the Secretary of Commerce.

### 3.1 Essential Fish Habitat Affected by the Project

HAPCs for salmon affected by the Project are: complex channel and floodplain habitat, as described in the Pacific Salmon FMP.

### 3.2 Adverse Effects on Essential Fish Habitat

The adverse effects to EFH are same as adverse effects to critical habitat described under section 2.4.5 of the ESA section 7 consultation on the proposed action.

### 3.3 Essential Fish Habitat Conservation Recommendations

NMFS has determined that the proposed action and the terms and conditions described in the Incidental Take Statement for the ESA section 7 consultation are adequate to conserve EFH for Pacific salmon.

### 3.4 Supplemental Consultation

The Corps must reinitiate EFH consultation with NMFS if the proposed action is substantially revised in a way that may adversely affect EFH, or if new information becomes available that effects the basis for NMFS' EFH Conservation Recommendations (50 CFR600.920(1)).

## 4. DATA QUALITY ACT DOCUMENTATION AND PRE-DISSEMINATION REVIEW

The Data Quality Act (DQA) specifies three components contributing to the quality of a document. They are utility, integrity, and objectivity. This section of the opinion addresses these DQA components, documents compliance with the DQA, and certifies that this opinion has undergone pre-dissemination review.

### 4.1 Utility

Utility principally refers to ensuring that the information contained in this consultation is helpful, serviceable, and beneficial to the intended users. The intended users of this opinion is the U.S. Army Corps of Engineers. Other interested users could include Tidewater, Inc. and the California Department of Fish and Wildlife. Individual copies of this opinion were provided to the the Corps. The format and naming adheres to conventional standards for style.

## 4.2 Integrity

This consultation was completed on a computer system managed by NMFS in accordance with relevant information technology security policies and standards set out in Appendix III, 'Security of Automated Information Resources,' Office of Management and Budget Circular A-130; the Computer Security Act; and the Government Information Security Reform Act.

## 4.3 Objectivity

Information Product Category: Natural Resource Plan

***Standards:*** This consultation and supporting documents are clear, concise, complete, and unbiased; and were developed using commonly accepted scientific research methods. They adhere to published standards including the NMFS ESA Consultation Handbook, ESA regulations, 50 CFR 402.01 et seq., and the MSA implementing regulations regarding EFH, 50 CFR 600.

***Best Available Information:*** This consultation and supporting documents use the best available information, as referenced in the References section. The analyses in this opinion and EFH consultation contain more background on information sources and quality.

***Referencing:*** All supporting materials, information, data and analyses are properly referenced, consistent with standard scientific referencing style.

***Review Process:*** This consultation was drafted by NMFS staff with training in ESA and MSA application and reviewed in accordance with West Coast Region ESA quality control and assurance processes.

## 5. REFERENCES


Bartholow, J.M. 2005. Recent water temperature trends in the Lower Klamath River, California. North American Journal of Fish Management 25:152-162.

Bjornn, T.C., M.A. Brusven, M.P. Molnau, J.H. Milligan, R.A. Klamt, E. Chaco, and C. Schaye. 1977. Transport of granitic sediment in streams and its effects on insects and fish. U.S. DOI, Office of Water Research Technology. Research Technical Completion Report Project B-036-IDA

Bjornn, T.C. and D.W. Reiser. 1991. Habitat requirements of salmonids in streams. Pp. 83-138 In: W.R. Meehan (*ed*.). Influences of forest and rangeland management on salmonid fishes and their habitats. American Fisheries Society Special Publication 19. Bethesda, MD. 751 pp.

Brown, A.V., M.M. Lyttle, and K.B. Brown. 1998. Impacts of gravel mining on gravel bed streams. Transactions of the American Fisheries Society 127:979-994.

Good, T. P., R. S. Waples, and P. B. Adams. 2005. Updated status of federally listed ESUs of West Coast salmon and steelhead. U.S. Department of Commerce, NOAA Technical Memorandum NMFS-NWFSC-66. 598 pp.

Intergovernmental Panel on Climate Change (IPCC). 2019. Special Report on the Ocean and Cryosphere in a Changing Climate, Cambridge University Press.

Lindley, S.T., R.S. Schick, E. Mora, P.B. Adams, J.J. Anderson, S. Greene, C. Hanson, B. May, D. McEwan, R.B. Macfarlane, C. Swanson, and J.G. Williams. 2007. Framework for assessing the viability of threatened and endangered Chinook salmon and steelhead in the Sacramento-San Joaquin Basin, San Francisco Estuary and Watershed Science 5: Article 4.

McElhany, P., M.H. Ruckelshaus, M.J. Ford, T.C. Wainwright, and E.P. Bjorkstedt. 2000. Viable salmonid populations and the recovery of evolutionarily significant units. U.S. Department of Commerce, NOAA Technical Memorandum NMFS-NWFSC-42. Seattle. 156 p.

Moyle, P.B. 2002. Inland Fishes of California. Second Edition. University of California Press. Berkeley, California.

National Marine Fisheries Service. 2002. Analysis of a flow-based minimum skim floor elevation for in-channel gravel mining in Humboldt County. National Marine Fisheries Service, Arcata Field Office. 18 pp.

NMFS. 2014. Final recovery plan for the Southern Oregon/Northern California Coast evolutionarily significant unit of coho salmon. September 2014. Arcata, California.

NMFS. 2016. Status review update for coho salmon (*Oncorhynchus kisutch*) from the Central California Coast and the California portion of the Southern Oregon/Northern California Coast evolutionarily significant units. National Marine Fisheries Service, Southwest Fisheries Science Center, Santa Cruz, California.

NMFS and CDFW. 2018. Smith River Plain Dissolved Copper Monitoring Report 2017-2018. National Marine Fisheries Service, Arcata, CA.

Pauley, G.B., G.L. Thomas, D.A. Marino, and D.C. Weigand. 1989. Evaluation of the effects of sediment bar scalping on juvenile salmonids in the Puyallup River drainage. Final Report to the Washington Department of Fisheries, Service Contract No. 1620. Cooperative Fisheries Research Unit, University of Washington. Seattle, Washington. 150 pp.

Perry, R.W., J.C. Risley, S.J. Brewer, E.C. Jones, and D.W. Rondorf. 2011. Simulating Daily Water temperatures of the Klamath River Under Dam Removal and Climate Change Scenarios. USGS. File Report 2011-2043.

PFMC. 2014. Appendix A to the Pacific Coast Salmon Fishery Management Plan, as modified by Amendment 18 to the Pacific Coast Salmon Plan: Identification and description of essential fish habitat, adverse impacts, and recommended conservation measures for salmon. Pacific Fishery Management Council, Portland, OR. September 2014. 196 p. + appendices.

Shapovalov, L., and A.C. Taft. 1954. The life histories of the steelhead rainbow trout *Salmo gairdneri gairdneri*) and silver salmon (*Oncorhynchus kisutch*) with special reference to Waddell Creek, California, and recommendations regarding their management. California Department of Fish and Game Fish Bulletin 98. 375 p.

Tidewater, Inc. 2019. Biological assessment for gravel extraction on the Huffman and Sultan Bars on the Smith River.

Garwood, J. M. 2017. 2011-2016 Salmonid Redd Abundance and Juvenile Salmonid Spatial Structure in the Smith River Basin, California and Oregon. Final Progress Report to the California Department of Fish and Wildlife. Fisheries Restoration Grants Program. Grantee agreement: P1210524.

Weitkamp, L. A., T. C. Wainwright, G. J. Bryant, G. B. Milner, D. J. Teel, R. G. Kope, and R. S. Waples. 1995. Status review of coho salmon from Washington, Oregon, and California. NOAA Technical Memorandum NMFS-NWFSC-24. U.S. Department of Commerce, NOAA, Northwest Fisheries Science Center, Seattle, Washington. 258 pp.

Williams, T.H., B. Spence, W. Duffy, D. Hillemeier, G. Kautsky, T.E. Lisle, M. McCain, T. Nickelson, E. Mora, and T. Pearson. 2008. Framework for assessing viability of threatened coho salmon in the Southern Oregon/Northern California Coasts evolutionarily significant unit. NOAA Technical Memorandum NMFS-SWFSC-432.

U.S. Department of Commerce, NOAA, NMFS, Southwest Fisheries Science Center Santa Cruz, California. 113 pp.

Williams, T.H., D.A. Boughton, S.T. Lindley, and B.C. Spence. 2011. Southern Oregon/Northern California Coast Recovery Domain 5-Year Review: Summary and Evaluation of Southern Oregon/Northern California Coast Coho Salmon ESU. U.S. Department of Commerce, National Oceanic and Atmospheric Administration, National Marine Fisheries Service, Fisheries Ecological Division, Southwest Fisheries Science Center, Santa Cruz, CA.

Williams, T.H., B.C. Spence, D.A. Boughton, R.C. Johnson, L. Crozier, N. Mantua, M. O'Farrell, and S.T. Lindley. 2016. Viability assessment for Pacific salmon and steelhead listed under the Endangered Species Act: Southwest. 2 February 2016 Report to National Marine Fisheries Service – West Coast Region from Southwest Fisheries Science Center, Fisheries Ecology Division 110 Shaffer Road, Santa Cruz, California 95060. 182 p.

Federal Register Notices Cited

64 FR 24049. National Marine Fisheries Service. Final Rule and Correction. Designated Critical Habitat; Central California Coast and Southern Oregon/Northern California Coasts Coho Salmon. May 5, 1999. Federal Register.

70 FR 37160. National Marine Fisheries Service. Final Rule. Endangered and Threatened Species: Final Listing Determinations for 16 ESUs of West Coast Salmon, and Final 4(d) Protective Regulations for Threatened Salmonid ESUs. June 28, 2005. Federal Register.

70 FR 52488. National Marine Fisheries Service. Final Rule. Endangered and Threatened Species: Designation of Critical Habitat for Seven Evolutionarily Significant Units of Pacific Salmon and Steelhead in California. September 2, 2005. Federal Register.

81 FR 7214. Fish and Wildlife Service and the National Oceanographic and Atmospheric Administration. Final Rule. Interagency Cooperation-Endangered Species Act of 1973, as Amended. Definition of destruction or adverse modification of critical habitat. February 11, 2016. Federal Register.