



UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
West Coast Region
1201 NE Lloyd Boulevard, Suite 1100
PORTLAND, OR 97232-1274

Refer to NMFS No:
WCRO-2019-03506

March 13, 2020

Jeff Robinson
Director, Community and Economic Development
City of Tacoma
747 Market Street, Room 900
Tacoma, Washington 98402-3793

Re: Endangered Species Act Section 7(a)(2) Biological Opinion, and Magnuson-Stevens
Fishery Conservation and Management Act Essential Fish Habitat Response for the Four
Single Family Home Infill Project, in Tacoma, Washington

Dear Mr. Robinson:

Thank you for your letter of November 18, 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 the Four Single Family Home Infill 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).

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 adversely affect the EFH of Pacific Salmon essential fish habitat (EFH). Therefore, we have included the results of that review in Section 3 of this document.

The enclosed document contains the biological opinion (Opinion) prepared by the NMFS pursuant to section 7(a)(2) of the ESA on the effects of the proposed action. In this Opinion, the NMFS concludes that the proposed action is not likely to jeopardize the continued existence of Puget Sound (PS) steelhead and Puget Sound Chinook salmon, or to result in the destruction or adverse modification of their designated critical habitat.

As required by section 7 of the ESA, the NMFS has provided an incidental take statement with this Opinion. The incidental take statement describes reasonable and prudent measures the NMFS considers necessary or appropriate to minimize the impact of incidental take associated with this action, and sets forth nondiscretionary terms and conditions that HUD must comply with to meet those measures. Incidental take from actions that meet these terms and conditions will be exempt from the ESA's prohibition against the take of listed species.

WCRO-2019-03115



This document also includes the results of our analysis of the action's likely effects on EFH pursuant to Section 305(b) of the MSA. The NMFS reviewed the likely effects of the proposed action on EFH, and concluded that the action would adversely affect designated EFH for Pacific Coast Salmon. Therefore, we have included the results of that review in Section 3 of this document.

Please contact Melaina Wright in the North Puget Sound Branch of the Oregon Washington Coastal Office at 206-526-6155, or by email at Melaina.Wright@noaa.gov if you have any questions concerning this consultation, or if you require additional information.

Sincerely,

A handwritten signature in blue ink, appearing to read "Kim W. Kratz".

Kim W. Kratz, Ph.D
Assistant Regional Administrator
Oregon Washington Coastal Office

cc: Jacinda Steltjes, City of Tacoma
Brian Sturdivant, HUD

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

Four Single Family Home Infill Project
Tacoma, Washington

NMFS Consultation Number: WCRO-2019-03506

Action Agency: U.S. Department of Housing and Urban Development


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?
Puget Sound steelhead (<i>Oncorhynchus mykiss</i>)	Threatened	Yes	No	Yes	N/A
Puget Sound Chinook (<i>O. tshawytscha</i>)	Threatened	Yes	No	Yes	N/A

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	Yes

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

Issued By:



 Kim W. Kratz, Ph.D
 Assistant Regional Administrator
 Oregon Washington Coastal Office

Date: March 13, 2020

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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

The 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 the Oregon Washington Coastal Office.

1.2 Consultation History

On November 18, 2019, NMFS received a request to initiate ESA section 7 consultation from the City of Tacoma, acting as Responsible Entity (RE) for the U.S. Department of Housing and Urban Development (HUD). The initiation package included an ESA section 7 consultation initiation email and biological assessment (BA) prepared by a consultant. While the consultant's documents asserted the project had No Effect on listed species or designated critical habitat, the RE, on behalf of HUD determined the action may affect but is not likely to adversely affect (NLAA) Puget Sound (PS) Chinook salmon and PS steelhead, and will not adversely affect designated critical habitat for either species. The RE also determined that the project would have not adversely Pacific salmon EFH.

On February 12, 2020, the RE contacted NMFS for a status update on the consultation. On February 13, 2020, the project was internally re-assigned, the RE was notified and consultation was initiated as a formal consultation.

Updates to the regulations governing interagency consultation (50 CFR part 402) were effective on October 28, 2019 [84 FR 44976]. This consultation was pending at that time, and we are applying the updated regulations to the consultation. As the preamble to the final rule adopting the new regulations noted, "[t]his final rule does not lower or raise the bar on section 7 consultations, and it does not alter what is required or analyzed during a consultation. Instead, it improves clarity and consistency, streamline consultations, and codifies existing practice." We have reviewed the information and analyses relied upon to complete this biological opinion in

light of the updated regulations, and conclude the opinion is fully consistent with the updated regulations.

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 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).

HUD, via City of Tacoma, is proposing to fund the conversion of a lot that formerly held one home with a yard and driveway into four single family residents to create affordable infill housing, each with its own driveway. The proposed action will remove existing native vegetation and convert the area to lawn (a conversion of 15,984 square feet) and impervious surface for a net increase in impervious surface over the existing condition (roughly double the amount of impervious surface over pre-project conditions). The project design includes infiltration of roof runoff from the four homes, and the remainder of the site’s stormwater will be directed to the City of Tacoma’s stormwater management system.

The project includes less than 1 acre of ground disturbance, thus no construction NPDES permit is required. The proponent indicates that best management practices will be utilized during construction to control erosion and spills.

The stormwater will enter the City’s stormwater system via Hosmer holding basin (a catch basin), then the water travels through stormwater pipes in Tacoma. The pipes carry stormwater via 3 pumps to the headwater of Flett Creek. The Flett Creek surface water drains through a series of four holding basins, including Hosmer,. At the last Flett Creek holding basin, a pump station sends the water to the Flett Dairy wetlands, where it flows into Flett Creek. Downstream, Flett Creek flows into Chambers Creek, a salmonid-bearing stream, which discharges into Chambers Bay.

We considered whether or not the proposed action would cause any other activities and determined that it would cause the following activities: a small increase in vehicular traffic. Because the project increases the number of homes from one to four, increased vehicular traffic to and from this site, and a corollary increase in stormwater contamination is a consequence caused by the proposed action.

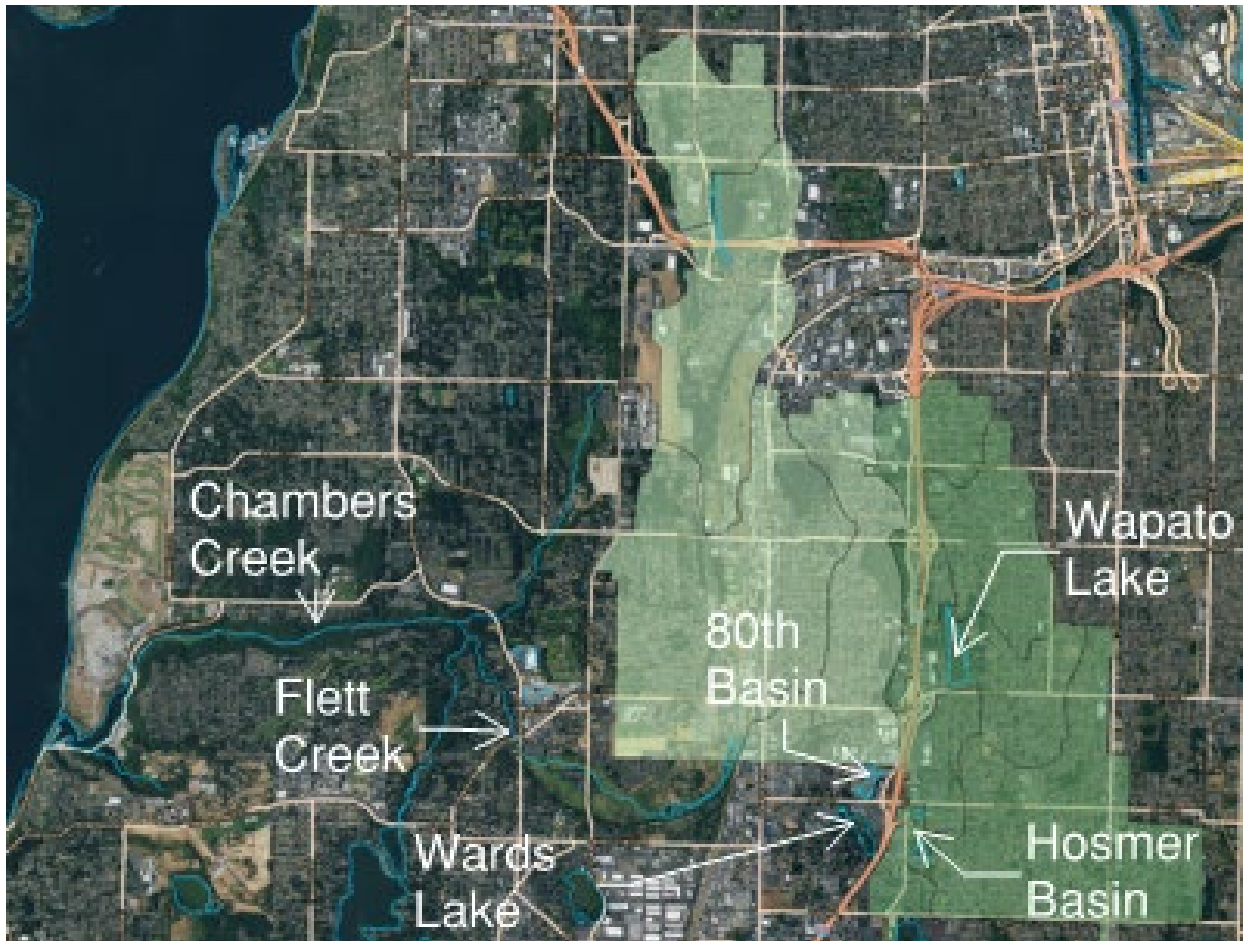


Figure 1. Vicinity Map

1.4 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 for this project includes aquatic areas downstream that are affected the municipal stormwater system to which this project’s stormwater will be contributed, Flett Creek to Chambers Bay. Chambers Bay is occupied by Puget Sound Chinook salmon and Puget Sound steelhead, and is designated critical habitat for both species. The action area is also EFH for Pacific Coast salmon.

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 provide 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 an adverse modification analysis. The jeopardy analysis relies upon the regulatory definition of "jeopardize the continued existence of" a listed species, which is "to engage in an action that reasonably 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(s) of critical habitat for (species) use(s) 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 each species 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' "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 function of the essential PBFs that help to form that conservation value.

One factor affecting the status of ESA-listed species considered in this opinion, and aquatic habitat at large, is climate change. Climate change is likely to play an increasingly important role in determining the abundance and distribution of ESA-listed species, and the conservation value of designated critical habitats, in the Pacific Northwest. These changes will not be spatially homogeneous across the Pacific Northwest. The largest hydrologic responses are expected to occur in basins with significant snow accumulation, where warming decreases snow pack, increases winter flows, and advances the timing of spring melt (Mote et al. 2016; Mote et al. 2014). Rain-dominated watersheds and those with significant contributions from groundwater may be less sensitive to predicted changes in climate (Mote et al. 2014; Tague et al. 2013).

During the last century, average regional air temperatures in the Pacific Northwest increased by 1-1.4°F as an annual average, and up to 2°F in some seasons based on average linear increase per decade (Abatzoglou et al. 2014; Kunkel et al. 2013). Warming is likely to continue during the next century as average temperatures are projected to increase another 3 to 10°F, with the largest increases predicted to occur in the summer (Mote et al. 2014). Decreases in summer precipitation of as much as 30 percent by the end of the century are consistently predicted across climate models (Mote et al. 2014). Precipitation is more likely to occur during October through March, less during summer months, and more winter precipitation will be rain than snow (ISAB 2007; Mote et al. 2013; Mote et al. 2014). Earlier snowmelt will cause lower stream flows in late spring, summer, and fall, and water temperatures will be warmer (ISAB 2007; Mote et al. 2014). Models consistently predict increases in the frequency of severe winter precipitation events (i.e., 20-year and 50-year events), in the western United States (Dominguez et al. 2012). The largest increases in winter flood frequency and magnitude are predicted in mixed rain-snow watersheds (Mote et al. 2014).

Overall, about one-third of the current cold-water salmonid habitat in the Pacific Northwest is likely to exceed key water temperature thresholds by the end of this century (Mantua et al. 2009). Higher temperatures will reduce the quality of available salmonid habitat for most freshwater life stages (ISAB 2007). Reduced flows will make it more difficult for migrating fish to pass

physical and thermal obstructions, limiting their access to available habitat (Isaak et al. 2012; Mantua et al. 2010). Temperature increases shift timing of key life cycle events for salmonids and species forming the base of their aquatic foodwebs (Crozier et al. 2011; Tillmann and Siemann 2011; Winder and Schindler 2004). Higher stream temperatures will also cause decreases in dissolved oxygen and may also cause earlier onset of stratification and reduced mixing between layers in lakes and reservoirs, which can also result in reduced oxygen (Meyer et al. 1999; Raymondi et al. 2013; Winder and Schindler 2004). Higher temperatures are likely to cause several species to become more susceptible to parasites, disease, and higher predation rates (Crozier et al. 2008; Raymondi et al. 2013; Wainwright and Weitkamp 2013).

As more basins become rain-dominated and prone to more severe winter storms, higher winter stream flows may increase the risk that winter or spring floods in sensitive watersheds will damage spawning redds and wash away incubating eggs (Goode et al. 2013). Earlier peak stream flows will also alter migration timing for salmon smolts, and may flush some young salmon and steelhead from rivers to estuaries before they are physically mature, increasing stress and reducing smolt survival (Lawson et al. 2004; McMahon and Hartman 1989).

In addition to changes in freshwater conditions, predicted changes for coastal waters in the Pacific Northwest as a result of climate change include increasing surface water temperature, increasing but highly variable acidity, and increasing storm frequency and magnitude (Mote et al. 2014). Elevated ocean temperatures already documented for the Pacific Northwest are highly likely to continue during the next century, with sea surface temperature projected to increase by 1.0 to 3.7°C by the end of the century (IPCC 2014). Habitat loss, shifts in species' ranges and abundances, and altered marine food webs could have substantial consequences to anadromous, coastal, and marine species in the Pacific Northwest (Reeder et al. 2013; Tillmann and Siemann 2011).

Moreover, as atmospheric carbon emissions increase, increasing levels of carbon are absorbed by the oceans, changing the pH of the water. Acidification also impacts sensitive estuary habitats, where organic matter and nutrient inputs further reduce pH and produce conditions more corrosive than those in offshore waters (Feely et al. 2012; Sunda and Cai 2012).

Global sea levels are expected to continue rising throughout this century, reaching likely predicted increases of 10 to 32 inches by 2081 to 2100 (IPCC 2014). These changes will likely result in increased erosion and more frequent and severe coastal flooding, and shifts in the composition of nearshore habitats (Reeder et al. 2013; Tillmann and Siemann 2011). Estuarine-dependent salmonids such as chum and Chinook salmon are predicted to be impacted by significant reductions in rearing habitat in some Pacific Northwest coastal areas (Glick et al. 2007).

Historically, warm periods in the coastal Pacific Ocean have coincided with relatively low abundances of salmon and steelhead, while cooler ocean periods have coincided with relatively high abundances, and therefore these species are predicted to fare poorly in warming ocean conditions (Scheuerell and Williams 2005; Zabel et al. 2006). This is supported by the recent observation that anomalously warm sea surface temperatures off the coast of Washington from 2013 to 2016 resulted in poor coho and Chinook salmon body condition for juveniles caught in

those waters (NWFSC 2015). Changes to estuarine and coastal conditions, as well as the timing of seasonal shifts in these habitats, have the potential to impact a wide range of listed aquatic species (Reeder et al. 2013; Tillmann and Siemann 2011).

The adaptive ability of these threatened and endangered species is depressed due to reductions in population size, habitat quantity and diversity, and loss of behavioral and genetic variation. Without these natural sources of resilience, systematic changes in local and regional climatic conditions due to anthropogenic global climate change will likely reduce long-term viability and sustainability of populations in many of these evolutionarily significant units (ESUs) (NWFSC 2015). New stressors generated by climate change, or existing stressors with effects that have been amplified by climate change, may also have synergistic impacts on species and ecosystems (Doney et al. 2012). These conditions will possibly intensify the climate change stressors inhibiting recovery of ESA-listed species in the future.

2.2.1 Status of the Species

This section provides a summary of listing and recovery plan information, status, and limiting factors for the species addressed in this opinion. More information can be found in recovery plans and status reviews for these species. These documents are available on the NMFS West Coast Region website (<http://www.fisheries.noaa.gov/>).

PS Chinook salmon

We listed the PS Chinook salmon ESU as threatened on June 28, 2005 (70 FR 37160). Recovery plans for PS Chinook salmon include the Shared Strategy for Puget Sound 2007 Plan and the NMFS 2006 Plan (NMFS 2006; SSDC 2007). The most recent status review was in 2015 (NWFSC 2015). This ESU comprises 22 populations distributed over five geographic areas. Most populations within the ESU have declined in abundance over the past 7 to 10 years, with widespread negative trends in natural-origin spawner abundance and hatchery-origin spawners present in high fractions in most populations outside of the Skagit watershed. Escapement levels for all populations remain well below the Technical Recovery Team (TRT) planning ranges for recovery, and most populations are consistently below the spawner-recruit levels identified by the TRT as consistent with recovery.

Limiting factors for PS Chinook salmon include:

1. Degraded floodplain and in river channel structure.
2. Degraded estuarine conditions and loss of estuarine habitat
3. Degraded riparian areas and loss of in river large woody debris
4. Excessive fine-grained sediment in spawning gravel
5. Degraded water quality and temperature
6. Degraded nearshore conditions
7. Impaired passage for migrating fish
8. Severely altered flow regime

PS Steelhead

We listed the PS steelhead distinct population segment (DPS) as threatened on May 11, 2007 (72 FR 26722). On December 27, 2019, we published a final recovery plan for PS steelhead (84 FR

71379) (NMFS 2019). The plan indicates that within each of the three MPGs, at least fifty percent of the populations must achieve viability, *and* specific DIPs must also be viable.

The most recent status review was in 2015 (NWFSC 2015). This DPS comprises 32 populations. The DPS is currently at very low viability, with most of the 32 populations and all three population groups at low viability. Information considered during the most recent status review indicates that the biological risks faced by the PS Steelhead DPS have not substantively changed since the listing in 2007, or since the 2011 status review. Furthermore, the PS Steelhead TRT recently concluded that the DPS was at very low viability, as were all three of its constituent major population groups (MPGs), and many of its 32 populations. In the near term, the outlook for environmental conditions affecting PS steelhead is not optimistic. While harvest and hatchery production of steelhead in PS are currently at low levels and are not likely to increase substantially in the foreseeable future, some recent environmental trends not favorable to PS steelhead survival and production are expected to continue.

Limiting factors for PS steelhead include:

1. Continued destruction and modification of habitat
2. Widespread declines in adult abundance despite significant reductions in harvest
3. Threats to diversity posed by use of two hatchery steelhead stocks
4. Declining diversity in the DPS, including the uncertain but weak status of summer-run fish
5. A reduction in spatial structure
6. Reduced habitat quality
7. Urbanization
8. Dikes, hardening of banks with riprap, and channelization

2.2.2 Status of the Critical Habitat

We designated critical habitat for PS Chinook salmon on September 2, 2005 (70 FR 52630). Critical habitat for PS Chinook salmon includes 1,683 miles of streams, 41 square miles of lakes, and 2,182 miles of nearshore marine habitat in PS. The PS Chinook salmon ESU has 61 freshwater and 19 marine areas within its range. Of the freshwater watersheds, 41 are rated high conservation value, 12 low conservation value, and eight received a medium rating. Of the marine areas, all 19 are ranked with high conservation value.

Critical habitat was designated for PS steelhead on February 24, 2016 (81 FR 9252). Critical habitat for Puget Sound steelhead includes 2,031 stream miles. Nearshore and offshore marine waters were not designated for this species. There are 66 watersheds within the range of this DPS. Nine watersheds received a low conservation value rating, 16 received a medium rating, and 41 received a high rating to the DPS.

Habitat threats to both species include, but are not limited to, point and non-point source pollution, artificial overwater cover, dredging, shoreline armoring, and fish passage barriers and lack of habitat complexity. These activities have diminished the availability and quality of freshwater and nearshore marine habitats, and reduced water quality across the region.

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).

Because stormwater runoff in from this site and this system to which it is contributed is not treated, we assume a full range of stormwater contaminants from residential and street runoff will travel to Chambers Bay, setting the boundary of the entire action area.

The project site currently consists of 4,245 square feet of impervious surface from prior development, and 23,446 square feet of vegetated area. Stormwater from the site enters a holding basin to remove large debris and garbage, and then is pumped to Flett Creek and on to Chambers Creek and ultimately to Chambers Bay.

Flett Creek originates near the community of Manitou and flows west 3.1 miles and converges at RM 2.55 on Chambers Creek; Flett Creek also contained good gravel and pool-riffle balance in the lower half of the stream. Seven day low flows as well as summer flows in Flett and Leach Creeks, the major tributaries of Chambers Creek, have decreased severely in recent years (Ecology, March 1995, cited in PCPWU 1997). Water quality factors are considered a limiting factor in this watershed.

In September 2000, a barrier to fish passage located under the 75th Street West bridge was removed and the stream was returned to natural conditions. The first known barrier to fish passage in Flett Creek is located at the downstream end of the detention ponds at ~RM 2.0, located on the west edge of Mountain View Memorial Park.

The valley between South Tacoma and the Manitou community also drains to the creek. The area of the valley within the City of Tacoma has been altered by commercial and industrial uses, including groundwater contamination. Approximately half of the drainage in the upper reaches of Flett Creek is over 40% impervious surface (PCPWU 1997). Upland habitat in the upper Flett Creek basin has been altered extensively for residential and commercial use. Historic spawning areas were lost where the creek curves north into the City of Tacoma (Chappell 1979, cited in PCPWU 1997) when the detention ponds were put in place. Flett Creek has no continuous riparian cover, and vegetation along the stream exists only in fragments. The riparian zone has been modified for residential and commercial use, leading to the degradation of the riparian functions (PCPWU 1997). Shrub cover is nonexistent except in a wetland in the middle reaches of the creek, but tree cover exists on some reaches of the creek.

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).

2.4.1 Effects to Listed Species

Stormwater runoff from the new buildings and driveways would adversely affect listed salmonids. The new building will increase the amount of impervious surface, and would increase the volume of stormwater runoff, and because only roof runoff is proposed for infiltration, the remainder of the stormwater that would come from the project site is expected to carry contaminants from fertilizers and pesticides used on the yards, and PAHs, oils, lubricants, and other fluids from cars that are used by the residents of each of the four homes. PS Chinook salmon and PS steelhead in the action area are likely to be affected directly by exposure to the stormwater and/or indirectly through their prey being exposed to the stormwater.

Though the applicant will implement the best management practices described in Section 1.3, some sediment and equipment-related contaminants may enter the City’s stormwater system during construction. The major sources of ongoing pollutants from the new building would be contaminants that accumulate on the building rooftops (WDOE 2008; WDOE 2014), as well as vehicle-related contaminants that accumulate on the entry drive and driveways of the proposed dwellings (McIntyre et al. 2015; McQueen et al. 2010; Peter et al. 2018; Spromberg et al. 2016).

Many common roofing materials leach metals, particularly arsenic, copper, and zinc (WDOE 2014). PAHs and phthalates may also be released from roofing materials. The Washington State Department of Ecology (WDOE) conducted a study of contaminants in roof runoff (WDOE 2014). The type of roof material proposed for this project (styrene butadiene styrene and asphalt roof liner) resulted in low, but detectable concentrations of metals, PAHs, and phthalates. The study used small, 3-meter sections of roof. WDOE (2014) indicated that longer roofs would likely increase contaminant loads. Rooftop structures that are made of unprotected galvanized steel, such as ductwork and flashing, may also leach high levels of zinc (WDOE 2008). Additionally, roof runoff is likely to contain pollutants that accumulate through atmospheric deposition (Lye 2009). However, because the proposed design includes infiltration of roof runoff, we expect these contaminants will not reach salmonid bearing waters.

Vehicle-related contaminants include petroleum-based PAHs, heavy metals, and a growing list of other contaminants that are just beginning to be identified (Peter et al. 2018), however, are very likely to reach salmonid bearing areas.

PS Chinook salmon can uptake contaminants directly through their gills, and through dietary exposure (Karrow et al. 1999; Lee and Dobbs 1972; McCain et al. 1990; Meador et al. 2006;

Neff 1982; Varanasi et al. 1993). Direct exposure to runoff-borne pollutants can cause effects in exposed fish that range from avoidance behaviors, to reduced growth, altered immune function, and immediate mortality in exposed individuals. The intensity of effects depends largely on the pollutant, its concentration, and/or the duration of exposure (Beitinger and Freeman 1983; Brette et al. 2014; Feist et al. 2011; Göbel et al. 2007; Incardona et al. 2005; Incardona et al. 2004; Incardona et al. 2006; McIntyre et al. 2012; Meador et al. 2006; Sandahl et al. 2007; Spromberg et al. 2016).

Beitinger and Freeman (1983) report that fish possess acute chemical discrimination abilities and that very low levels of some water-borne contaminants can trigger strong avoidance behaviors. Exposure to PAHs can cause reduced growth, increased susceptibility to infection, and increased mortality in juvenile salmonids (Meador et al. 2006; Varanasi et al. 1993). Zinc can bind to fish gills and cause suffocation (WDOE 2008). In freshwater, exposure to dissolved copper at concentrations between 0.3 to 3.2 µg/L above background levels has been shown to cause avoidance of an area, to reduce salmonid olfaction, and to induce behaviors that increase juvenile salmon's vulnerability to predators (Giattina et al. 1982; Hecht et al. 2007; McIntyre et al. 2012; Sommers et al. 2016; Tierney et al. 2010). Acute exposure to untreated stormwater runoff from roads and bridges has been directly linked to pre-spawner die off in adult coho salmon (McIntyre et al. 2015; Spromberg et al. 2016). However, the specific contaminants and mechanisms that cause the mortality are still not well understood. Some level of synergism between the various contaminants may be involved.

Indirect (trophic) exposure to runoff-borne pollutants can injure juvenile salmonids. Stormwater contaminants that settle to the bottom would be biologically available at the site into the foreseeable future. Amphipods and copepods uptake PAHs from contaminated sediments (Landrum and Scavia 1983; Landrum et al. 1984; Neff 1982), and pass them to juvenile Chinook salmon and other fish through the food web. Varanasi et al. (1993) found high levels of PAHs in the stomach contents of juvenile Chinook salmon in the contaminated Duwamish Waterway. They also reported reduced growth, suppressed immune competence, as well as increased mortality in juvenile Chinook salmon that was likely caused by the dietary exposure to PAHs. Meador et al. (2006) demonstrated that dietary exposure to PAHs caused "toxicant-induced starvation" with reduced growth and reduced lipid stores in juvenile Chinook salmon. The authors surmised that these impacts could severely impact the odds of survival in affected juvenile Chinook salmon.

The concentrations of the various contaminants that would remain in the effluent are unknown and likely to be highly variable depending on the timing and intensity of individual storm events. The concentrations would be positively correlated with the length of time between precipitation events. The highest concentrations would likely occur near the start of heavy downpour events that occur after a long dry spell that allows pollutants to build-up on roofs and other impervious surfaces, such as in early- to mid-fall. Lower concentrations would occur later in given storm and/or later in the season when precipitation events are more frequent because the build-up of pollutants would be lower. Despite the uncertainty and variability of the concentration or load, it is certain that the additional contribution of contaminants from this site will persist for the foreseeable future, with episodic contribution of contaminants, indicating that all future cohorts of

PS Chinook and PS steelhead in Chambers Creek and Chambers Bay could be exposed at any of several life history stages.

The annual numbers of PS Chinook salmon and PS steelhead that may be exposed to stormwater from the new building are unquantifiable with any degree of certainty, as is the intensity of any effects that an exposed individual may experience.

2.4.2 Effects to Critical Habitat

Designated critical habitat within the action area for PS Chinook salmon consists of freshwater rearing sites and freshwater migration corridors and their essential and biological features. The PBFs of designated PS Chinook salmon critical habitat in the action area include:

- 1) Freshwater rearing sites with
 - i) water quantity and floodplain connectivity to form and maintain physical habitat conditions and support juvenile growth and mobility;
 - ii) water quality and forage supporting juvenile development; and
 - iii) natural cover such as shade, submerged and overhanging large wood, log jams and beaver dams, aquatic vegetation, large rocks and boulders, side channels, and undercut banks.
- 2) Freshwater migration corridors free of obstruction and excessive predation with
 - i) water quantity and quality conditions and natural cover such as submerged and overhanging large wood, aquatic vegetation, large rocks and boulders, side channels, and undercut banks supporting juvenile and adult mobility and survival.

Water Quantity

Because of the holding basin and pump system that moves stormwater from the project site through the riverine system, the proposed action is not likely to affect water quantity.

Floodplain Connectivity

Because of the holding basin and pump system that moves stormwater from the project site through the riverine system the proposed action will not alter floodplain connectivity.

Water Quality

The proposed action would cause a long-term but minor decrease in water quality. Over the life of the new buildings and driveways, untreated stormwater from the property would discharge residual levels of petroleum-based pollutants, metals, and other contaminants into Chambers Bay, Washington.

Forage

The proposed action would cause long-term minor effects on forage. Over the life of the new buildings and driveways, untreated stormwater would be a persistent source of contaminants that could be taken up by benthic invertebrates that are forage resources for juvenile Chinook salmon.

Natural Cover

The proposed action will have not affect natural cover in riparian areas, and will cause no change in the quality and function of this PBF.

Free of Obstruction and Excessive Predation

The proposed action will not obstruct migration corridors or increase predation. Therefore, the proposed action will cause no change in the quality and function of this PBF.

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 2.4).

The current condition of ESA-listed species and designated critical habitat within the action area are described in the Status of the Species and Critical Habitat and the Environmental Baseline sections above. The contribution of non-federal activities to those conditions include past and on-going shoreline development and upland urbanization. Those actions were driven by a combination of economic conditions that characterized traditional natural resource-based industries, general resource demands associated with settlement of local and regional population centers, and the efforts of social groups dedicated to restoration and use of natural amenities, such as cultural inspiration and recreational experiences.

NMFS is unaware of any specific future non-federal activities that are reasonably certain to affect the action area. However, NMFS is reasonably certain that other future non-federal actions such as upland urban development are all likely to continue and increase in the future as the human population continues to grow across the region. Continued habitat loss and degradation of water quality from urbanization and chronic low-level inputs of non-point source pollutants will likely continue into the future.

The intensity of these influences depends on many social and economic factors, and therefore is difficult to predict. Further, the adoption of more environmentally acceptable practices and standards may gradually reduce some negative environmental impacts over time. Interest in restoration activities has increased as environmental awareness rises among the public. State, tribal, and local governments have developed plans and initiatives to benefit ESA-listed salmonids within Lake Washington and the watersheds that flow into the action area. However,

the implementation of plans, initiatives, and specific restoration projects are often subject to political, legislative, and fiscal challenges that increase the uncertainty of their success.

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 2.5) to the environmental baseline (Section 2.4) and the cumulative effects (Section 2.6), 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 diminish the value of designated or proposed critical habitat as a whole for the conservation of the species.

Salmonids

The species considered in this Opinion have been listed under the ESA, based on declines from historic levels of abundance and productivity, loss of spatial structure and diversity, and an array of limiting factors as a baseline habitat condition. Each species will be affected over time by cumulative effects, some positive – as recovery plan implementation and regulatory revisions increase habitat protections and restoration, and some negative – as climate change and unregulated or difficult to regulate sources of environmental degradation persist or increase. Overall, to the degree that habitat trends are negative, as described below, effects on viability parameters of each species are also likely to be negative. In this context we consider the effects of the proposed action's effect on individuals of the listed species at the population scale.

The action area provides habitat for freshwater life histories of PS Chinook salmon and PS steelhead. The action area is affected by multiple factors degrading water quality and riparian conditions. Cumulative effects are likely to include further degrading factors as human population growth and climate change continue, however some of these effects may be tempered new types of stormwater management or in some locations reversed by restoration activities.

In this context we consider the addition of harm to future cohorts of salmonids exposed to incremental water quality degradation from the proposed action. While it is certain that the fractional addition of contaminants will expose multiple fish at various lifestages over many years, we cannot discern that this will reduce abundance in such a degree that productivity or spatial structure of either species will be diminished.

Critical Habitat

As described above at Section 2.5.2, the proposed action is likely to adversely affect designated critical habitat for PS Chinook salmon. Past and ongoing anthropogenic activities have degraded salmonid critical habitat throughout the Puget Sound basin including the action area. Water quality and forage, features of critical habitat for both species will be incrementally diminished by the proposed action, and this diminishment will coincide with cumulative effects that result from nonfederal actions, such as human population growth and climate change. Some of these

effects could be minimized by new water quality management techniques, or reversed in some places by restoration activities.

Ultimately, the proposed action will keep certain habitat conditions at slightly reduced functional levels, however, based on the best available information, the scale of the proposed action's effects, when considered in combination with the degraded baseline, cumulative effects, and the impacts of climate change, will be too small to cause any detectable long-term negative changes in the quality or functionality of freshwater migration corridor PBFs in the action area. As the critical habitat will generally maintain its current level of functionality, we believe the action area will continue to serve the intended conservation role for PS Chinook salmon and PS steelhead.

2.7 Conclusion

After reviewing and analyzing the current status of the listed species and critical habitat, the environmental baseline within the action area, the effects of the proposed action, the effects of other activities caused by the proposed action, and cumulative effects, it is NMFS' biological opinion that the proposed action is not likely to jeopardize the continued existence of PS steelhead and PS Chinook salmon, or destroy or adversely modify PS Chinook salmon 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:

Harm of PS Chinook salmon and PS steelhead from exposure to:

- stormwater-related degraded water quality, and
- stormwater-related contaminated forage.

NMFS cannot predict with meaningful accuracy the number of PS Chinook salmon and PS steelhead that are reasonably certain to be injured or killed annually by exposure to any of these stressors. The distribution and abundance of the fish that occur within an action area are affected by a variety of factors including habitat quality, competition, predation, and the interaction of processes that influence genetic, population, and environmental characteristics. These biotic and environmental processes interact in ways that may be random or directional, and may operate across far broader temporal and spatial scales than are affected by the proposed action. Thus, the distribution and abundance of fish within the action area at any time over the life of the project cannot be precisely predicted. Additionally, NMFS knows of no device or practicable technique that would yield reliable counts of individuals that may experience these impacts.

In such circumstances, NMFS uses the causal link established between the activity and the likely extent and duration of changes in habitat conditions to describe the extent of take as a numerical level of habitat disturbance.

The most appropriate surrogates for take are action-related parameters that are directly related to the magnitude of the expected take. The best available surrogates for the extent of take of PS Chinook salmon and PS steelhead from exposure to stormwater-related degraded water quality and contaminated forage is the amount of pollution generating impervious surface.

The amount of pollution generating impervious surface is appropriate because the volume of stormwater would be directly related to the amount of deleterious vehicle-related contaminants in the stormwater. Any increase in the concentration of the contaminants within stormwater would increase in the amount of contaminants that enter Chambers Bay and therefore increases the probability that individual fish would be exposed to contaminant levels (directly or through the trophic web) that would result in deleterious behavioral changes and/or sublethal health effects.

In summary, the extent of take for this action is defined as site modifications creating 3,418 sf pollution generating impervious surface.

HUD and its RE have the capacity to confirm via As Built reporting if the developer exceeds this threshold. Exceedance of any of the exposure limits described above would constitute an exceedance of authorized take that would trigger the need to reinitiate consultation.

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).

HUD shall require the applicant to:

1. Implement monitoring and reporting to confirm that the extend of take for the proposed action is not exceeded.

2.8.4 Terms and Conditions

The terms and conditions described below are non-discretionary, and HUD or any applicant must comply with them in order to implement the RPMs (50 CFR 402.14). HUD 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:
 - i) Require the applicant to submit as built construction documents to verify that
 - (1) Roof runoff is infiltrated as designed and
 - (2) Total pollution generating impervious surface does not exceed 3,418 sf
 - ii) If post construction monitoring indicates failure to conform to project design criteria in either regard, send a report to: projectreports.wcr@noaa.gov. Be sure to include the NMFS Tracking number for this project in the subject line: Attn: WCRO-2019-03506.

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).

HUD should encourage the applicant to:

- 1) Use pervious pavements for hardscape features such as sidewalks or patios;
- 2) Not use fertilizers and pesticides onsite;
- 3) Paint or coat all galvanized metal onsite with non-toxic paint or sealant;
- 4) Incorporate yard plantings of native vegetation to improve the tree cover-to-impervious ratio; and
- 5) Re-evaluate if the site can incorporate bioswales at any location to provide minimal site treatment prior to discharge to the municipal stormwater system.

2.10 Reinitiation of Consultation

This concludes formal consultation for the Four Single Family Home Infill Project in Tacoma, Washington.

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-STEVENSON 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 HUD 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

The proposed action and action area for this consultation are described in Sections 1 and 2 of this document. The action area includes areas designated as EFH for various life-history stages of Pacific Coast salmon (PFMC 2014). The action area is not designated as a habitat area of particular concern (HAPC).

3.2 Adverse Effects on Essential Fish Habitat

The ESA portion of this document describes the adverse effects of this proposed action on ESA-listed species and critical habitat, and is relevant to the effects on EFH for Pacific coast salmon. Based on the analysis of effects presented in Section 2.5, the proposed action will cause small-scale adverse effects on this EFH through post-construction stormwater runoff that may cause direct or indirect physical, chemical, or biological alteration of the water or substrate, and through the contamination of prey. Therefore, we have determined that the proposed action would adversely affect the EFH identified above.

3.3 Essential Fish Habitat Conservation Recommendations

Fully implementing these EFH conservation recommendations would protect, by avoiding or minimizing the adverse effects described in Section 3.2, above, approximately 0.02 acres of designated EFH for Pacific Coast salmon.

To reduce adverse alteration of the physical, chemical, or biological characteristics of the water and substrates and available prey,

- 1) HUD should encourage the applicant to:
 - i) Use pervious surfaces for sidewalks and patios
 - ii) Not use fertilizers and pesticides onsite;
 - iii) Paint or coat all galvanized metal onsite with non-toxic paint or sealant;
 - iv) Re-evaluate if the site can incorporate bioswale treatment of remaining runoff prior to discharge to the municipal system.
 - v) Incorporate yard plantings of native vegetation to slightly improve the vegetative cover-to-impervious surface ration.

3.4 Statutory Response Requirement

As required by section 305(b)(4)(B) of the MSA, HUD must provide a detailed response in writing to NMFS within 30 days after receiving an EFH Conservation Recommendation. Such a response must be provided at least 10 days prior to final approval of the action if the response is inconsistent with any of NMFS' EFH Conservation Recommendations unless NMFS and the Federal agency have agreed to use alternative time frames for the Federal agency response. The response must include a description of measures proposed by the agency for avoiding, minimizing, mitigating, or otherwise offsetting the impact of the activity on EFH. In the case of a response that is inconsistent with the Conservation Recommendations, the Federal agency must explain its reasons for not following the recommendations, including the scientific justification for any disagreements with NMFS over the anticipated effects of the action and the measures needed to avoid, minimize, mitigate, or offset such effects (50 CFR 600.920(k)(1)).

In response to increased oversight of overall EFH program effectiveness by the Office of Management and Budget, NMFS established a quarterly reporting requirement to determine how many conservation recommendations are provided as part of each EFH consultation and how many are adopted by the action agency. Therefore, we ask that in your statutory reply to the EFH portion of this consultation, you clearly identify the number of conservation recommendations accepted.

3.5 Supplemental Consultation

HUD must reinstate EFH consultation with NMFS if the proposed action is substantially revised in a way that may adversely affect EFH, or if new information becomes available that affects the basis for NMFS' EFH Conservation Recommendations (50 CFR 600.920(l)).

4. DATA QUALITY ACT DOCUMENTATION & 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 user of this opinion is HUD. Other interested users could include housing project applicants, the citizens of Tacoma, and tribes. Individual copies of this opinion were provided to HUD. The document will be available within two weeks at the NOAA Library Institutional Repository (<https://repository.library.noaa.gov/welcome>). 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 implementation, and reviewed in accordance with West Coast Region ESA quality control and assurance processes.

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