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-2021-00134

August 5, 2021

Shelley J. Kjos
Housing Resource Coordinator
Skagit County Public Health
700 South 2nd Street Room #301
Mount Vernon, Washington 98273

Re: Endangered Species Act Section 7(a)(2) Biological Opinion, and Magnuson-Stevens Fishery Conservation and Management Act Essential Fish Habitat Response for the Housing Authority of Skagit County (HASC) Family Housing Project, Skagit County, Washington (HUC: 171100070202 – Nookachamps Creek)

Dear Ms. Kjos:

Thank you for your letter of January 29, 2021, 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 HASC Family Housing Project.

Thank you, also, for your February 17, 2021 request for consultation pursuant to the essential fish habitat (EFH) provisions in Section 305(b) of the Magnuson-Stevens Fishery Conservation and Management Act (MSA)(16 U.S.C. 1855(b)) for this action.

The enclosed document contains the biological opinion (opinion) prepared by the NMFS pursuant to section 7 of the ESA on the effects of the proposed action. In this opinion, the NMFS concludes that the proposed action would adversely affect but is not likely to jeopardize the continued existence of Puget Sound (PS) Chinook salmon and PS Sound steelhead. This opinion also documents our conclusion that the proposed action is not likely to adversely affect designated critical habitat for PS steelhead or southern resident (SR) killer whales and their designated critical habitat.

This opinion includes an incidental take statement (ITS) that describes reasonable and prudent measures (RPMs) the NMFS considers necessary or appropriate to minimize the incidental take associated with this action, and sets forth nondiscretionary terms and conditions that Skagit County Public Health (SCPH) 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.

Section 3 of this document includes our analysis of the action's likely effects on EFH pursuant to Section 305(b) of the MSA. Based on that analysis, the NMFS concluded that the action would adversely affect designated freshwater EFH for Pacific Coast Salmon. Therefore, we have provided 1 conservation recommendation that can be taken by the SCPH to avoid, minimize, or otherwise offset potential adverse effects on EFH. We also concluded that the action would not adversely affect marine EFH for Pacific Coast Salmon, or EFH for Pacific Coast Groundfish and Coastal Pelagic Species. Therefore, consultation under the MSA is not required for those EFHs.

Section 305(b) (4) (B) of the MSA requires Federal agencies to provide a detailed written response to NMFS within 30 days after receiving this recommendation. If the response is inconsistent with the EFH conservation recommendations, the SCPH must explain why the recommendations will not be followed, including the scientific justification for any disagreements over the effects of the action and recommendations. 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 request that in your statutory reply to the EFH portion of this consultation you clearly identify the number of conservation recommendations accepted.

Please contact Donald Hubner in the North Puget Sound Branch of the Oregon/Washington Coastal Office at (206) 526-4359, or by electronic mail at Donald.Hubner@noaa.gov if you have any questions concerning this consultation, or if you require additional information.

Sincerely,

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

cc: Beth Boram, Beacon Development Group
Peggy Williamson, Fulcrum Environmental Consulting

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

Housing Authority of Skagit County (HASC) Family Housing Project
Skagit County, Washington (HUC: 171100070202 – Nookachamps Creek)

NMFS Consultation Number: WCRO-2021-00134

Action Agency: Skagit County Public Health

Affected Species and 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?
Chinook salmon (Oncorhynchus tshawytscha) Puget Sound (PS)	Threatened	Yes	No	N/A	N/A
Steelhead (O. mykiss) PS	Threatened	Yes	No	No	No
Killer whales (Orcinus orca) Southern resident (SR)	Endangered	No	No	No	No

N/A = not applicable. The action area is outside designated critical habitat, or critical habitat has not been designated.

Affected Essential Fish Habitat (EFH) and NMFS' Determinations:

Fishery Management Plan That Describes EFH in the Project Area	Does Action Have an Adverse Effect on EFH?	Are EFH Conservation Recommendations Provided?
Pacific Coast Salmon	Yes	Yes
Pacific Coast Groundfish	No	No
Coastal Pelagic Species	No	No

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: August 5, 2021

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LIST OF ABREIVIATIONS

BA – Biological Assessment
BMP – Best Management Practices
CFR – Code of Federal Regulations
DIP – Demographically Independent Population
DPS – Distinct Population Segment
DQA – Data Quality Act
EF – Essential Feature
EFH – Essential Fish Habitat
ESA – Endangered Species Act
ESU – Evolutionarily Significant Unit
FR – Federal Register
FMP – Fishery Management Plan
HAPC – Habitat Area of Particular Concern
HASC – Housing Authority of Skagit County
HUC – Hydrologic Unit Code
HPA – Hydraulic Project Approval
ITS – Incidental Take Statement
MPG – Major Population Group
MSA – Magnuson-Stevens Fishery Conservation and Management Act
NMFS – National Marine Fisheries Service
NOAA – National Oceanic and Atmospheric Administration
PAH – Polycyclic Aromatic Hydrocarbons
PBF – Physical or Biological Feature
PCE – Primary Constituent Element
PFMC – Pacific Fishery Management Council
PS – Puget Sound
PSTRT – Puget Sound Technical Recovery Team
PSSTRT – Puget Sound Steelhead Technical Recovery Team
RPA – Reasonable and Prudent Alternative
RPM – Reasonable and Prudent Measure
SCPH – Skagit County Public Health
SR – Southern Resident (Killer Whales)
TSS – Total Suspended Sediments
VSP – Viable Salmonid Population
WCR – West Coast Region (NMFS)
WDFW – Washington State Department of Fish and Wildlife
WDOE – Washington State Department of Ecology

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 Oregon Washington Coastal Office.

1.2 Consultation History

U.S. Department of Housing and Urban Development (HUD) regulations at 24 CFR 58 delegate to responsible entities (RE) (i.e. units of local government, such as a town, city, county, tribe, or state) the authority to consult with the services for HUD actions related to the subject RE. Because Skagit County Public Health (SCPH) is the RE for the Housing Authority of Skagit County (HASC) Family Housing project, the NMFS is consulting directly with SCPH.

On January 8, 2021 SCPH requested informal consultation for the proposed action. Following discussions with the NMFS, SCPH withdrew their request for informal consultation on January 12, 2021, and began technical assistance with the NMFS to reconsider their effects determination. On January 29, 2021, prior to completion of technical assistance, the NMFS received SCPH's request for formal consultation (SCPH 2021a), which included an attached biological assessment (BA; Fulcrum 2020). On February 4, 2021, the NMFS requested additional information in a letter of insufficiency. Subsequently, numerous emails and telephone calls were exchanged, and a remote meeting between the SCPH, project proponents and designers, the NMFS, and HUD was held on February 26, 2021. The meeting and most other communications were primarily focused on the inclusion of adequate treatment of stormwater prior to its discharge to the adjacent wetlands and streams. The NMFS received sufficient information and initiated formal consultation on March 12, 2021.

This Opinion is based on the information in the BA; supplemental materials and responses to NMFS questions provided by email (SCPH 2021a – e); recovery plans, status reviews, and critical habitat designations for ESA-listed PS Chinook salmon and PS steelhead; published and unpublished scientific information on the biology and ecology of those species; and relevant scientific and gray literature (see Literature Cited).

1.3 Proposed Federal Action

Under the ESA, "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), whereas under the MSA, 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 SCPH would use federal funding from the U. S. Department of Housing and Urban Development (HUD) to partially fund the redevelopment of a former greenhouse/nursery parcel to construct the HASC Family Housing project at 4100 East College Way in Mount Vernon, Washington (Figure 1).

Figure 1. Google Earth photographs of the HASC Family Housing project site (yellow pins and red outline) in Mount Vernon, Washington. The left image shows the project's location relative to Skagit Bay and Puget Sound. The right image shows the site's existing conditions. Trumpeter Creek is visible in the northeast part of the image. College Way Creek is hidden within the trees that extend to Trumpeter Creek from the southern portion of the property.

The purpose of the action is to provide affordable family housing for farmworkers and low-income people with disabilities. On an area of about 4.78 acres, the HASC contractors would construct 5 1- to 3-story buildings that would comprise 51 single floor housing units, driveways and parking areas, lawns, and outdoor recreational areas (Figure 2). Construction is expected to begin in 2021, after all necessary permit approvals have been issued, and is expected to last about 14 months (Beacon 2021a). Work would include the use of standard residential construction methods and equipment, such as bulldozers, graders, backhoes, dump trucks delivery trucks, concrete trucks, asphalt paving equipment, and a range of handheld tools. There would be no in-water work, and above-water work would be limited to the replacement and relocation of a small wooden pedestrian bridge over College Way Creek and the placement of 8 pieces of large wood near the top of the bank of that creek (Fulcrum 2020).

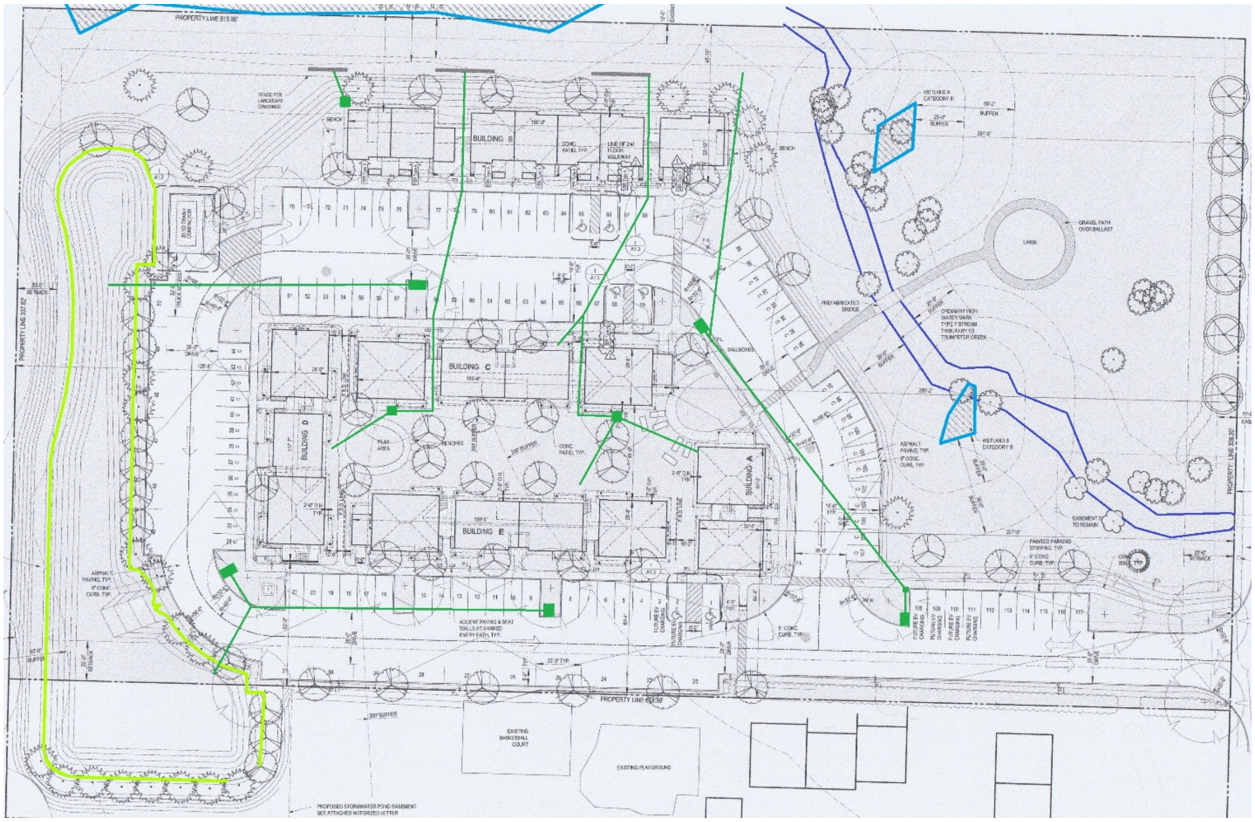

Figure 2. Plan drawing of the HASC Family Housing project area. North is to the left. The green boxes and lines indicate the approximate locations of 8 Filterra stormwater treatment units and the related pipes. A stormwater detention pond is outlined in yellow at the north end of the property. Trumpeter Creek is not shown, but is north (left) of the detention pond. The high water lines of College Way Creek are indicated in dark blue, and light blue indicates wetland areas (Adapted from Environmental Works 2020).

The buildings would be roofed with asphalt shingles without moss inhibitor. Non-galvanized materials would be used for gutters and exterior fasteners. No rooftop or other exterior heating, ventilation, and air conditioning (HVAC) components would be installed. The units would be heated using cove-type interior wall heaters. Hardscape would consist of concrete foundations and walkways, and asphalt driveways and parking areas.

As part of the project but under separate permit, the recreation area would include a paved loop trail in the southeast portion of the property, and the replacement and relocation of an existing wooden footbridge across College Way Creek, which is a tributary of Trumpeter Creek. The HASC would obtain and comply with a Washington State Department of Fish and Wildlife (WDFW) Hydraulic Project Approval (HPA) prior to the footbridge replacement component.

Soil conditions at the site preclude adequate infiltration of stormwater. To address this issue, all stormwater from the driveways, parking areas, roofs, and landscape areas would first receive enhanced treatment with Contech Filterra filtration units (Beacon 2021b) prior to discharge into a detention pond at the north end of the property, or to a wetland area along the northeast side of the property (Figure 2).

Stormwater from the driveways and parking areas would enter curb openings and flow to 1 of 5 filtration units that would be located in planter islands along the parking areas (2 4x8 FTIBC0408 units and 3 4x6 FTIBC0406 units). From the filter units, the stormwater from the northern, northeastern, and northwestern driveway and parking areas would flow through pipes to a 21,140-cubic foot detention pond at the north end of the property from which it would eventually discharge via level spread to the Trumpeter Creek buffer area. Stormwater from the southern driveways and parking areas would flow from the filtration units through pipes to a dissipater at the southeast corner of the property and discharge via level spread to the College Way Creek buffer area. Stormwater from the building roofs and the landscape areas would flow through 1 of 3 4x6 Filterra FTIBC0406 filtration units prior to being piped to discharge spreader bars adjacent to the wetland area located along the northeast side of the property (Beacon 2021b; SCPH 2021c – e).

The NMFS also considered whether or not the proposed action would cause any other activities. We determined that the action would cause increased vehicular traffic at the site that would be associated with the new homes (private, service, and emergency vehicles). Therefore, we have also analyzed the effects of the vehicular traffic that would be associated with those new homes in the effects section of this Opinion.

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, the 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.

SCPH determined that the proposed action is likely to adversely affect PS Chinook salmon, PS steelhead. SCPH also determined that the proposed action is not likely to adversely affect designated critical habitat for PS steelhead and SR killer whales and their critical habitat, and would have no effect on designated critical habitat for PS Chinook salmon (Table 1). Because the proposed action is likely to adversely affect PS Chinook salmon and PS steelhead, the NMFS has proceeded with formal consultation for the proposed action. Additionally, our concurrence with SCPH's determination that their action is not likely to adversely affect PS steelhead critical habitat, and SR killer whales and their critical habitat is documented in the "Not Likely to Adversely Affect" Determinations section (2.12).

Table 1. ESA-listed species and critical habitat that may be affected by the proposed action.

ESA-listed species and critical habitat likely to be adversely affected (LAA)				
Species	**Status**	**Species**	**Critical Habitat**	**Listed/ CH Designated**
Chinook salmon (*Oncorhynchus tshawytscha*) Puget Sound	Threatened	LAA	N/A	06/28/05 (70 FR 37160) / 09/02/05 (70 FR 52630)
steelhead (*O. mykiss*) Puget Sound	Threatened	LAA	NLAA	05/11/07 (72 FR 26722) / 02/24/16 (81 FR 9252)
ESA-listed species and critical habitat not likely to be adversely affected (NLAA)				
Species	**Status**	**Species**	**Critical Habitat**	**Listed/ CH Designated**
Killer whales (Orcinus orca) Southern resident (SR)	Endangered	NLAA	NLAA	11/18/05 (70 FR 57565) / 11/29/06 (71 FR 69054)

LAA = likely to adversely affect NLAA = not likely to adversely affect
N/A = not applicable. The action area is outside designated critical habitat, or critical habitat has not been designated.

2.1 Analytical Approach

This 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 range-wide 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. As described in the "Not Likely to Adversely Affect" Determinations section (2.12) of this opinion, this action is extremely unlikely to cause detectable effects on designated critical habitat for any of the species considered in this consultation. Therefore, examination of the conditions of the critical habitats for those species is not included within this section.

The summaries that follow describe the status of the ESA-listed species that occur within the action area and are considered in this opinion. More detailed information on the biology, habitat, and conservation status and trend of these listed resources can be found in the listing regulations and critical habitat designations published in the Federal Register and in the recovery plans and other sources at: https://www.fisheries.noaa.gov/species-directory/threatened-endangered, and are incorporated here by reference.

Listed Species

Viable Salmonid Population (VSP) Criteria: For Pacific salmonids, we commonly use four VSP criteria (McElhany et al. 2000) to assess the viability of the populations that constitute the species. These four criteria (spatial structure, diversity, abundance, and productivity) encompass the species' "reproduction, numbers, or distribution" as described in 50 CFR 402.02. When these parameters are collectively at appropriate levels, they maintain a population's capacity to adapt to various environmental conditions and allow it to sustain itself in the natural environment.

"Spatial structure" refers both to the spatial distributions of individuals in the population and the processes that generate that distribution. A population's spatial structure depends on habitat quality and spatial configuration, and the dynamics and dispersal characteristics of individuals in the population.

"Diversity" refers to the distribution of traits within and among populations. These range in scale from DNA sequence variation in single genes to complex life history traits.

"Abundance" generally refers to the number of naturally-produced adults that return to their natal spawning grounds.

"Productivity" refers to the number of naturally-spawning adults produced per parent. When progeny replace or exceed the number of parents, a population is stable or increasing. When progeny fail to replace the number of parents, the population is in decline.

For species with multiple populations, we assess the status of the entire species based on the biological status of the constituent populations, using criteria for groups of populations, as described in recovery plans and guidance documents from technical recovery teams.

Considerations for species viability include having multiple populations that are viable, ensuring that populations with unique life histories and phenotypes are viable, and that some viable populations are both widespread to avoid concurrent extinctions from mass catastrophes and spatially close to allow functioning as metapopulations (McElhany et al. 2000).

<u>Puget Sound (PS) Chinook Salmon:</u> The PS Chinook salmon evolutionarily significant unit (ESU) was listed as threatened on June 28, 2005 (70 FR 37160). We adopted the recovery plan for this ESU in January 2007. The recovery plan consists of two documents: the Puget Sound salmon recovery plan (SSPS 2007) and the final supplement to the Shared Strategy's Puget Sound salmon recovery plan (NMFS 2006). The recovery plan adopts ESU and population level viability criteria recommended by the Puget Sound Technical Recovery Team (PSTRT) (Ruckelshaus et al. 2002). The PSTRT's biological recovery criteria will be met when all of the following conditions are achieved:

- The viability status of all populations in the ESU is improved from current conditions, and when considered in the aggregate, persistence of the ESU is assured;
- Two to four Chinook salmon populations in each of the five biogeographical regions of the ESU achieve viability, depending on the historical biological characteristics and acceptable risk levels for populations within each region;
- At least one population from each major genetic and life history group historically present within each of the five biogeographical regions is viable;
- Tributaries to Puget Sound not identified as primary freshwater habitat for any of the 22 identified populations are functioning in a manner that is sufficient to support an ESU-wide recovery scenario; Production of Chinook salmon from tributaries to Puget Sound not identified as primary freshwater habitat for any of the 22 identified populations occurs in a manner consistent with ESU recovery; and
- Populations that do not meet all the Viable Salmon Population (VSP) parameters are sustained to provide ecological functions and preserve options for ESU recovery.

General Life History: Chinook salmon are anadromous fish that require well-oxygenated water that is typically less than 63º F (17º C), but some tolerance to higher temperatures is documented with acclimation. Adult Chinook salmon spawn in freshwater streams, depositing fertilized eggs in gravel "nests" called redds. The eggs incubate for three to five months before juveniles hatch and emerge from the gravel. Juveniles spend from three months to two years in freshwater before migrating to the ocean to feed and mature. Chinook salmon spend from one to six years in the ocean before returning to their natal freshwater streams where they spawn and then die.

Chinook salmon are divided into two races, stream-types and ocean-types, based on the major juvenile development strategies. Stream-type Chinook salmon tend to rear in freshwater for a year or more before entering marine waters. Conversely, ocean-type juveniles tend to leave their natal streams early during their first year of life, and rear in estuarine waters as they transition into their marine life stage. Both stream- and ocean-type Chinook salmon are present, but ocean-type Chinook salmon predominate in Puget Sound populations.

Chinook salmon are further grouped into "runs" that are based on the timing of adults that return to freshwater. Early- or spring-run chinook salmon tend to enter freshwater as immature fish, migrate far upriver, and finally spawn in the late summer and early autumn. Late- or fall-run Chinook salmon enter freshwater at an advanced stage of maturity, move rapidly to their spawning areas, and spawn within a few days or weeks. Summer-run fish show intermediate characteristics of spring and fall runs, without the extensive delay in maturation exhibited by spring-run Chinook salmon. In Puget Sound, spring-run Chinook salmon tend to enter their natal rivers as early as March, but do not spawn until mid-August through September. Returning summer- and fall-run fish tend to enter the rivers early-June through early-September, with spawning occurring between early August and late-October.

Yearling stream-type fish tend to leave their natal rivers late winter through spring, and move relatively directly to nearshore marine areas and pocket estuaries. Out-migrating ocean-type fry tend to migrate out of their natal streams beginning in early-March. Those fish rear in the tidal delta estuaries of their natal stream for about two weeks to two months before migrating to marine nearshore areas and pocket estuaries in late May to June. Out-migrating young of the year parr tend to move relatively directly into marine nearshore areas and pocket estuaries after leaving their natal streams between late spring and the end of summer.

Spatial Structure and Diversity: The PS Sound Chinook salmon ESU includes all naturally spawning populations of Chinook salmon from rivers and streams flowing into Puget Sound including the Straits of Juan De Fuca from the Elwha River, eastward, including rivers and streams flowing into Hood Canal, South Sound, North Sound and the Strait of Georgia in Washington. The ESU also includes the progeny of numerous artificial propagation programs (NWFSC 2015). The PSTRT identified 22 extant populations, grouped into five major geographic regions, based on consideration of historical distribution, geographic isolation, dispersal rates, genetic data, life history information, population dynamics, and environmental and ecological diversity. The PSTRT distributed the 22 populations among five major biogeographical regions, or major population groups (MPGs), that are based on similarities in hydrographic, biogeographic, and geologic characteristics (Table 2).

Hatchery-origin spawners are present in high fractions in most populations within the ESU, with the Whidbey Basin the only MPG with consistently high fractions of natural-origin spawners. Between 1990 and 2014, the fraction of natural-origin spawners has declined in many of the populations outside of the Skagit watershed (NWFSC 2015).

Table 2. Extant PS Chinook salmon populations in each biogeographic region (Ruckelshaus et al. 2002, NWFSC 2015).

Biogeographic Region	Population (Watershed)
Strait of Georgia	North Fork Nooksack River
	South Fork Nooksack River
Strait of Juan de Fuca	Elwha River
	Dungeness River
Hood Canal	Skokomish River
	Mid Hood Canal River
Whidbey Basin	Skykomish River
	Snoqualmie River
	North Fork Stillaguamish River
	South Fork Stillaguamish River
	Upper Skagit River
	Lower Skagit River
	Upper Sauk River
	Lower Sauk River
	Suiattle River
	Upper Cascade River
Central/South Puget Sound Basin	Cedar River
	North Lake Washington/Sammamish River
	Green/Duwamish River
	Puyallup River
	White River
	Nisqually River

Abundance and Productivity: Available data on total abundance since 1980 indicate that abundance trends have fluctuated between positive and negative for individual populations, but productivity remains low in most populations, and hatchery-origin spawners are present in high fractions in most populations outside of the Skagit watershed. Available data now show that most populations have declined in abundance over the past 7 to 10 years. Further, escapement levels for all populations remain well below the PSTRT planning ranges for recovery, and most populations are consistently below the spawner-recruit levels identified by the PSTRT as consistent with recovery (NWFSC 2015). The current information on abundance, productivity, spatial structure and diversity suggest that the Whidbey Basin MPG is at relatively low risk of extinction. The other four MPGs are considered to be at high risk of extinction due to low abundance and productivity (NWFSC 2015). The most recent 5-year status review concluded that the ESU should remain listed as threatened (NMFS 2017).

Limiting Factors: Factors limiting recovery for PS Chinook salmon include:

- Degraded floodplain and in-river channel structure

- Degraded estuarine conditions and loss of estuarine habitat
- Riparian area degradation and loss of in-river large woody debris
- Excessive fine-grained sediment in spawning gravel
- Degraded water quality and temperature
- Degraded nearshore conditions
- Impaired passage for migrating fish
- Severely altered flow regime

PS Chinook Salmon within the Action Area: The PS Chinook salmon that are likely to occur in the action area would be fall-run Chinook salmon from the Lower Skagit River population (NWFSC 2015; WDFW 2021a). Both stream- and ocean-type Chinook salmon are present in this populations, with the majority being ocean-types.

Since 1974, the total abundance trend for PS Chinook salmon in the Skagit River basin has been slightly negative. However, across the basin, the trend has been slightly positive since the early 1990s, and the fraction of natural-origin spawners is over 90 percent (NWFSC 2015). WDFW considers the population to be a native stock with wild production. Between 1974 and 2018, the total abundance for PS Chinook salmon in the Lower Skagit River population has fluctuated between about 409 and 5,590 individuals. Total abundances was 1,923 adult fish in 2018 WDFW 2021b).

Returning adult Chinook salmon tend to enter the Skagit River early-June through early-September. Juveniles typically begin to migrate out of their natal streams as early as February, with migration being heaviest between early-March and mid-July. They are likely to be present in estuarine and nearshore marine waters through the end of summer while they rear and transitioning into their marine life stage. Adult and juvenile fall-run Chinook salmon are documented in the north fork of Nookachamps Creek and their presence is modeled, but unconfirmed, in the main stem of Nookachamps Creek and in Trumpeter Creek. Therefore, any occurrence of PS Chinook salmon in the action area is expected to be at low numbers.

Puget Sound (PS) steelhead: The PS steelhead distinct population segment (DPS) was listed as threatened on May 11, 2007 (72 FR 26722). The NMFS adopted the recovery plan for this DPS in December 2019. In 2013, the Puget Sound Steelhead Technical Recovery Team (PSSTRT) identified 32 demographically independent populations (DIPs) within the DPS, based on genetic, environmental, and life history characteristics. Those DIPs are distributed among three geographically-based major population groups (MPGs); Northern Cascades, Central and South Puget Sound; and Hood Canal and Strait de Fuca (Myers et al. 2015) (Table 3).

In 2015, the PSSTRT concluded that the DPS is at "very low" viability; with most of the 32 DIPs and all three MPGs at "low" viability based on widespread diminished abundance, productivity, diversity, and spatial structure when compared with available historical evidence (Hard et al. 2015). Based on the PSSTRT viability criteria, the DPS would be considered viable when all three component MPG are considered viable. A given MPG would be considered viable when: 1) 40 percent or more of its component DIP are viable; 2) mean DIP viability within the MPG exceeds the threshold for viability; and 3) 40 percent or more of the historic life history strategies (i.e., summer runs and winter runs) within the MPG are viable. For a given DIP to be considered viable, its probability of persistence must exceed 85 percent, as calculated by Hard et al. (2015), based on abundance, productivity, diversity, and spatial structure within the DIP.

Table 3. PS steelhead Major Population Groups (MPGs), Demographically Independent Populations (DIPs), and DIP Viability Estimates (Modified from Figure 58 in Hard *et al.* 2015).

Geographic Region (MPG)	Demographically Independent Population (DIP)	Viability
Northern Cascades	Drayton Harbor Tributaries Winter Run	Moderate
	Nooksack River Winter Run	Moderate
	South Fork Nooksack River Summer Run	Moderate
	Samish River/Bellingham Bay Tributaries Winter Run	Moderate
	Skagit River Summer Run and Winter Run	Moderate
	Nookachamps Creek Winter Run	Moderate
	Baker River Summer Run and Winter Run	Moderate
	Sauk River Summer Run and Winter Run	Moderate
	Stillaguamish River Winter Run	Low
	Deer Creek Summer Run	Moderate
	Canyon Creek Summer Run	Moderate
	Snohomish/Skykomish Rivers Winter Run	Moderate
	Pilchuck River Winter Run	Low
	North Fork Skykomish River Summer Run	Moderate
	Snoqualmie River Winter Run	Moderate
	Tolt River Summer Run	Moderate
Central and South Puget Sound	Cedar River Summer Run and Winter Run	Low
	North Lake Washington and Lake Sammamish Winter Run	Moderate
	Green River Winter Run	Low
	Puyallup River Winter Run	Low
	White River Winter Run	Low
	Nisqually River Winter Run	Low
	South Sound Tributaries Winter Run	Moderate
	East Kitsap Peninsula Tributaries Winter Run	Moderate
Hood Canal and Strait de Fuca	East Hood Canal Winter Run	Low
	South Hood Canal Tributaries Winter Run	Low
	Skokomish River Winter Run	Low
	West Hood Canal Tributaries Winter Run	Moderate
	Sequim/Discovery Bay Tributaries Winter Run	Low
	Dungeness River Summer Run and Winter Run	Moderate
	Strait of Juan de Fuca Tributaries Winter Run	Low
	Elwha River Summer Run and Winter Run	Low

General Life History: PS steelhead exhibit two major life history strategies. Ocean-maturing, or winter-run fish typically enter freshwater from November to April at an advanced stage of maturation, and then spawn from February through June. Stream-maturing, or summer-run fish typically enter freshwater from May to October at an early stage of maturation, migrate to headwater areas, and hold for several months prior to spawning in the following spring. After hatching, juveniles rear in freshwater from one to three years prior to migrating to marine habitats (two years is typical). Smoltification and seaward migration typically occurs from April to mid-May. Smolt lengths vary between watersheds, but typically range from 4.3 to 9.2 inches (109 to 235 mm) (Myers et al. 2015). Juvenile steelhead are generally independent of shallow nearshore areas soon after entering marine water (Bax et al. 1978, Brennan et al. 2004, Schreiner et al. 1977), and are not commonly caught in beach seine surveys. Recent acoustic tagging studies (Moore et al. 2010) have shown that smolts migrate from rivers to the Strait of Juan de Fuca from one to three weeks. PS steelhead feed in the ocean waters for one to three years (two years is again typical), before returning to their natal streams to spawn. Unlike Chinook salmon, most female steelhead, and some males, return to marine waters following spawning (Myers et al. 2015).

Spatial Structure and Diversity: The PS steelhead DPS includes all naturally spawned anadromous steelhead populations in streams in the river basins of the Strait of Juan de Fuca, Puget Sound, and Hood Canal, Washington, bounded to the west by the Elwha River (inclusive) and to the north by the Nooksack River and Dakota Creek (inclusive). The DPS also includes six hatchery stocks that are considered no more than moderately diverged from their associated natural-origin counterparts (USDC 2014). PS steelhead are the anadromous form of *O. mykiss* that occur below natural barriers to migration in northwestern Washington State (NWFSC 2015). Non-anadromous ''resident'' *O. mykiss* (a.k.a. rainbow trout) occur within the range of PS steelhead but are not part of the DPS due to marked differences in physical, physiological, ecological, and behavioral characteristics (Hard et al. 2015). As stated above, the DPS consists of 32 DIP that are distributed among three geographically-based MPG. An individual DIP may consist of winter-run only, summer-run only, or a combination of both life history types. Winter-run is the predominant life history type in the DPS (Hard et al. 2015).

Abundance and Productivity: Available data on total abundance since the late 1970s and early 1980s indicate that abundance trends have fluctuated between positive and negative for individual DIP. However, low productivity persists throughout the 32 DIP, with most showing downward trends, and a few showing sharply downward trends (Hard et al. 2015, NWFSC 2015). Since the mid-1980s, trends in natural spawning abundance have also been temporally variable for most DIP but remain predominantly negative, and well below replacement for at least 8 of the DIP (NWFSC 2015). Smoothed abundance trends since 2009 show modest increases for 13 DIP. However, those trends are similar to variability seen across the DPS, where brief periods of increase are followed by decades of decline. Further, several of the upward trends are not statistically different from neutral, and most populations remain small. Nine of the evaluated DIP had geometric mean abundances of fewer than 250 adults, and 12 had fewer than 500 adults (NWFSC 2015). Over the time series examined, the over-all abundance trends, especially for natural spawners, remain predominantly negative or flat across the DPS, and general steelhead abundance across the DPS remains well below the level needed to sustain natural production into the future (NWFSC 2015). The PSSTRT recently concluded that the PS steelhead DPS is currently not viable (Hard et al. 2015). The DPS's current abundance and productivity are considered to be well below the targets needed to achieve delisting and recovery. Growth rates are currently declining at 3 to 10% annually for all but a few DIPs, and the extinction risk for most populations is estimated to be moderate to high. The most recent 5-year status review concluded that the DPS should remain listed as threatened (NMFS 2017).

Limiting Factors: Factors limiting recovery for PS steelhead include:

- The continued destruction and modification of steelhead habitat
- Widespread declines in adult abundance (total run size), despite significant reductions in harvest in recent years

- Threats to diversity posed by use of two hatchery steelhead stocks (Chambers Creek and Skamania)
- Declining diversity in the DPS, including the uncertain but weak status of summer run fish
- A reduction in spatial structure
- Reduced habitat quality through changes in river hydrology, temperature profile, downstream gravel recruitment, and reduced movement of large woody debris
- In the lower reaches of many rivers and their tributaries in Puget Sound where urban development has occurred, increased flood frequency and peak flows during storms and reduced groundwater-driven summer flows, with resultant gravel scour, bank erosion, and sediment deposition
- Dikes, hardening of banks with riprap, and channelization, which have reduced river braiding and sinuosity, increasing the likelihood of gravel scour and dislocation of rearing juveniles

PS Steelhead within the Action Area: The PS steelhead that are most likely to occur in the action area would be from the Nookachamps Creek Winter Run DIP. However, WDFW reports that both summer- and winter-run steelhead are documented in the north fork and main stem of Nookachamps Creek (NWFSC 2015; WDFW 2021a). The viability of the Nookachamps River DIP is considered moderate, and the winter-run is identified as one of the largest populations in the PS steelhead DPS. However, the overall trend for the winter-run is slightly negative (NWFSC 2015). The combined summer- and winter-run PS steelhead escapement in the Skagit River basin has fluctuated between 2,502 and 13,194 individuals between 1978 and 2018, with 6,084 adults returning in 2018 (WDFW 2021c). Specific trend information for the Nookachamps Creek winter-run DIP are unavailable.

Adult steelhead may enter the Skagit River basin year-round. Summer-run fish are thought to enter the basin from May to October, while winter-run fish enter mid-October through mid-May. However, both spawn March through June, with peak spawning in May. Between April and mid-May, 1- to 3-year old smolts leave the river and quickly move toward offshore marine waters. Winter-run steelhead spawning and rearing is documented in the north fork and main stem of Nookachamps Creek. Winter-run steelhead presence is modeled, but unconfirmed, in Trumpeter Creek. Therefore, any occurrence of PS steelhead in the action area is expected to be at low numbers. Adult and juvenile PS steelhead use the action area as a migration corridor, and juveniles may also use the area as rearing habitat.

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 project site is located in Mount Vernon, Washington, immediately adjacent to Trumpeter and College Way Creeks (Figure 1). As described in section 2.5, stormwater impacts on water quality would be the project-related stressor with the greatest range of detectable effects on the species considered in this consultation, and the effects of those impacts would be undetectable beyond 300 feet (91 m) downstream in Trumpeter and College Way Creeks from the northeast corner of the project site. However, trophic connectivity between PS Chinook salmon and the SR killer whales that feed on them extends the action area to the marine waters of Puget Sound. The described area overlaps with the geographic ranges of the ESA-listed species and the boundaries of designated critical habitats identified in Table 1. The action area also overlaps with areas that have been designated as EFH, under the MSA, for Pacific Coast salmon, Pacific Coast groundfish, and coastal pelagic species.

2.4 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).

Environmental conditions at the project site and the surrounding area: The project site is located in Mount Vernon, Washington, immediately adjacent to Trumpeter and College Way Creeks (Figure 1). Although the action area includes the marine waters of Puget Sound, all detectable effects of the action would be limited to Trumpeter and College Way Creeks within about 300 feet from the downstream-most location where the project's stormwater would enter those creeks (Sections 2.5 & 2.12). Therefore this section focuses on habitat conditions in Trumpeter and College Way Creeks, and does not discuss Puget Sound habitat conditions.

Trumpeter Creek and the Trumpeter Sub Basin have been impacted by agriculture and urban development. The sub basin consists of a combination of streams, ditches, culverts, and swales that pass through a mix of agricultural lands and the northeastern portion of the City of Mount Vernon (Figure 3). From its confluence with Nookachamps Creek, Trumpeter Creek extends to the west and passes immediately north of the project site, with its tributary College Way Creek flowing along the east side of the site. All of Trumpeter Creek's tributary streams pass under roads and in some cases under developed areas. Where above ground, the channels wind between homes, with many stretches devoid of significant riparian vegetation.

The water quality within the action area is suboptimal for salmonids. The Skagit Stream Team reported the results of water quality sampling done in the Trumpeter Basin as well as across the greater Skagit River Basin between October 22, 2015 and July 27, 2016 (SST, 2017). They reported dissolved oxygen and temperature levels exceeded State standards numerous times at two sites (below 9.5 mg/ and above 16°C), with dissolved oxygen exhibiting a declining trend, and temperature exhibiting an increasing trend. They also reported that turbidity and fecal coliform exceeded State standards at all sampling sites, with fecal coliform exhibiting an increasing trend. Within the action area, College Way Creek is on Washington State Department of Ecology's (WDOE) 303(d) list for impaired dissolved oxygen and temperature (Category 5). Other listings include bacteria, (Category 4) and pH (Category 1). Within the action area, Trumpeter Creek is WDOE-listed for bacteria (Category 4) and dissolved oxygen (Category 2) (WDOE 2021).

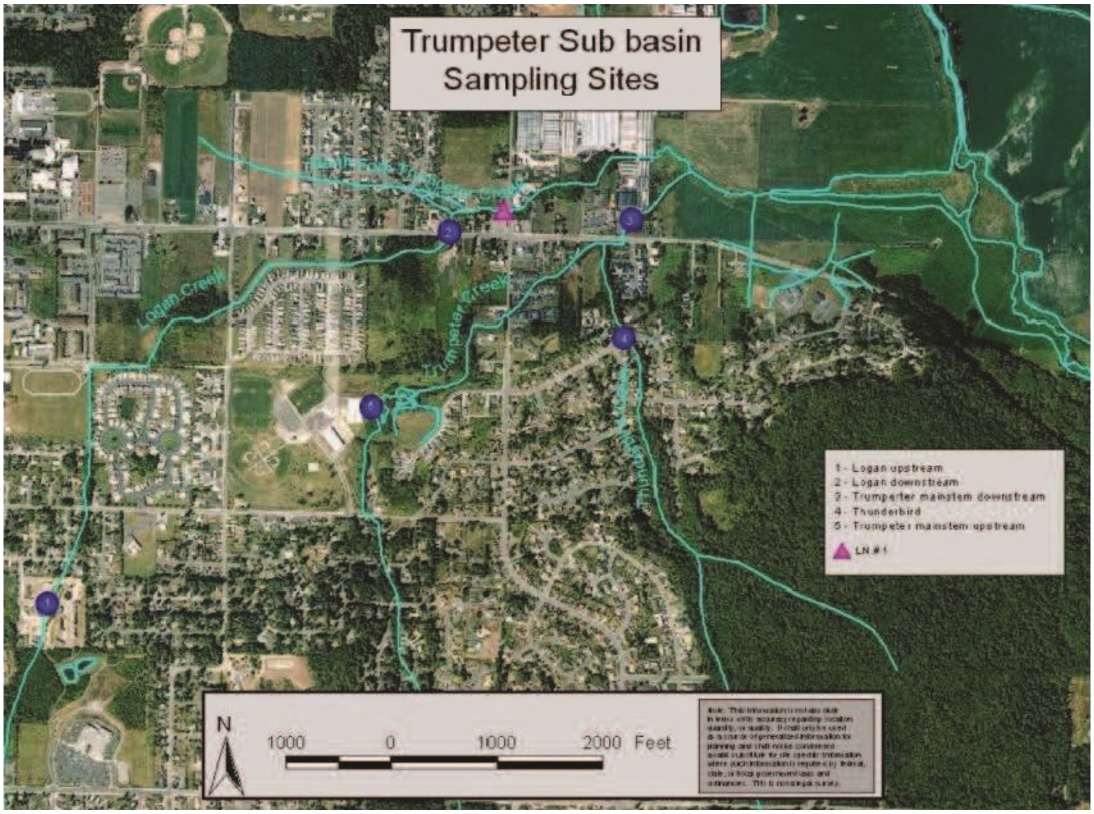

Figure 3. Trumpeter Basin tributaries that flow past the HASC Family Housing site and into Nookachamps Creek. The blue dots indicate water quality sampling locations within the basin. Blue dot 3, just right of top-center in the image, marks the project site (Adapted from Figure 6 in SST 2017).

On the positive side, the U.S. Fish and Wildlife Service (USFWS) and Ducks Unlimited conducted a stream restoration project in 2017 to improve the aquatic habitat for salmonids in the lower reach of Trumpeter Creek, beginning at a point about 160 feet downstream of Trumpeter Creek's confluence with College Way Creek, and extending to Trumpeter Creek's confluence with Nookachamps Creek. Along that reach, they converted the straightened and channelized ditch that Trumpeter Creek had become through agricultural impacts, and recreated a low gradient, meandering stream and wetland complex that closely aligned with the creeks historic channel, and included large wood, pools, and enhanced riparian vegetation.

Currently, low numbers of coho salmon and cutthroat trout are the only salmonids that have been observed in Trumpeter Creek and its tributaries, but fall-run Chinook salmon and winter-run steelhead are both modeled by WDFW as potentially present in Trumpeter Creek (WDFW 2021a). Within the action area, Trumpeter Creek likely provides limited rearing habitat for those species, but no spawning is believed to occur in the Trumpeter Creek basin.

The past and ongoing anthropogenic impacts described above have reduced the action area's ability to support rearing and migrating PS Chinook salmon and PS steelhead. However, the action likely provides some migratory and rearing value for adults and juveniles of both species.

Climate Change: Climate change has affected the environmental baseline of aquatic habitats across the region and within the action area. However, the effects of climate change have not been homogeneous across the region, nor are they likely to be in the future. During the last century, average air temperatures in the Pacific Northwest have increased by 1 to 1.4° F (0.6 to 0.8 °C), and up to 2° F (1.1 °C) in some seasons (based on average linear increase per decade; Abatzoglou et al. 2014; Kunkel et al. 2013). Recent temperatures in all but two years since 1998 ranked above the 20th century average (Mote et al. 2013). Warming is likely to continue during the next century as average temperatures are projected to increase another 3 to 10° F (1.7 to 5.6° C), with the largest increases predicted to occur in the summer (Mote et al. 2014).

Decreases in summer precipitation of as much as 30% 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 and 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).

The combined effects of increasing air temperatures and decreasing spring through fall flows are expected to cause increasing stream temperatures; in 2015, this resulted in 3.5-5.3°C increases in Columbia Basin streams and a peak temperature of 26°C in the Willamette (NWFSC 2015). 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).

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 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.

2.5 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).

As described in Section 1.3, the SCPH would use federal funding from HUD to partially fund the construction of the HASC Family Housing project at 4100 East College Way in Mount Vernon, Washington (Figure 1). The project includes no in-water construction, and the only over-water work would be limited to the removal of a small pedestrian bridge across College Way Creek that would be replaced by a new small pedestrian bridge that would be installed at a slightly different location. However, the stormwater runoff and artificial illumination from the new development may affect PS Chinook salmon and PS steelhead within Trumpeter and College Way Creeks.

2.5.1 Effects on Listed Species

Stormwater runoff

Stormwater runoff from the HASC Family Housing project would adversely affect PS Chinook salmon and PS steelhead. The completed project would have an impervious surface area of about 2.18 acres, which would be a 0.48-acre reduction over the existing 2.66 acres of asphalt and concrete that currently covers the 4.78-acre site. Although the action is not likely to increase the volume of stormwater runoff, it is likely to introduce pollutants to the stormwater, and over the decades-long life of the new housing, PS Chinook salmon and PS steelhead in Trumpeter Creek are likely to be directly affected by the stormwater through exposure to water-borne contaminants, and/or indirectly affected through exposure to contaminated prey.

A major source of pollutants from the new housing would be vehicle-related contaminants that accumulate on the driveway and parking lot surfaces (McIntyre et al. 2015; McQueen et al. 2010; Peter et al. 2018; Spromberg et al. 2015). Contaminants that accumulate on the building rooftops (WDOE 2008, 2014), and contaminants from vegetated areas would also add to the chemical loading of the stormwater. Accumulated contaminants from those areas would become mobilized by stormwater and transported to the adjacent Trumpeter and College Way Creeks.

Vehicle-related contaminants include petroleum-based polycyclic aromatic hydrocarbons (PAHs), heavy metals, and a growing list of other contaminants that are just beginning to be identified (Peter et al. 2018). Many common roofing materials leach metals, particularly arsenic, copper, and zinc (WDOE 2014). Rooftop structures such as air conditioners and ducting that are made of unprotected galvanized steel may also leach high levels of zinc (WDOE 2008). Additionally, roof runoff is likely to contain pollutants that accumulate through atmospheric deposition (Lye 2009). Fertilizers, herbicides, insecticides, and pet wastes are additional sources of contamination when stormwater from lawn areas runs off instead of infiltrating.

PS Chinook salmon and PS steelhead 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; Gobel et al. 2007; Incardona et al. 2004, 2005, and 2006; Mcintyre et al. 2012; Meadore et al. 2006; Sandahl et al. 2007; Spromberg et al. 2015).

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). However, dissolved copper's olfactory toxicity in salmon diminishes quickly with increased salinity. 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. 2015). Recent research indicates that a globally ubiquitous tire rubber antioxidant is highly toxic to salmon, and is also commonly present at toxic levels in U.S. West Coast streams that receive stormwater runoff from roadways (Z. Tian et al. 2020).

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 HASC Family Housing project's stormwater from the driveways, parking areas, roofs, and landscaped areas of would be treated by Contech Filterra filtration units. From the filter units, the stormwater from the northern driveway and parking areas would flow through pipes to a 21,140-cubic foot detention pond at the north end of the property from which it would eventually discharge via level spread to the Trumpeter Creek buffer area. Stormwater from the southern driveways and parking areas would flow from the filtration units through pipes to a dissipater at the southeast corner of the property and discharge via level spread to the College Way Creek buffer area. Stormwater from the building roofs and the landscape areas would flow through filtration units prior to being piped to discharge spreader bars adjacent to the wetland area located along the northeast side of the property.

The Filterra units would remove high levels of pollutants from the stormwater, but residual levels would remain in the effluent. The system is expected to remove about 86% of the total suspended solids (TSS); 87% of total petroleum hydrocarbons; 55% of the total copper; 43% of dissolved copper; 56% of the total zinc; 54% of dissolved zinc; 70% of the total phosphorus; and 34% of the total nitrogen from the incoming stormwater (Contech 2021a & b). However, because infiltration is not a reasonable option at the site, the stormwater with residual contaminants would be discharged to a mix of a detention pond and spreader bars from which it would flow to the Trumpeter and College Way Creeks by overland flow for the next several decades.

The concentrations of the various contaminants that would remain in the effluent that reaches the creeks 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 volume of traffic and outdoor chemical use at the new housing area, and 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, such as in early- to mid-fall. Lower concentrations would occur later in a given storm and/or later in the season when precipitation events are more frequent because the build-up of pollutants would be lower. Similarly, the distance from the outfall where the contaminants would dilute to levels too low to cause detectable direct and/or indirect effects is also unknown and expected to be highly variable.

Given the high level of treatment and the stormwater's subsequent flow through a detention pond and vegetated buffer areas prior to entering the creeks, it is very unlikely that the concentrations of action-attributable contaminants in the creek waters and/or in prey organisms would be high enough to cause detectable effects in juvenile salmonids in either creek beyond 300 feet downstream from the northeast corner of the housing site. However, to avoid underestimating the stormwater's potential impacts on listed fish, this assessment assumes that any PS Chinook salmon and PS steelhead that enters either creek within 300 feet of the northeast corner of the housing site may be exposed to contaminated stormwater and/or contaminated prey that could be attributable to stormwater from the new housing project, and those that remain beyond that range would not.

The annual numbers of PS Chinook salmon and PS steelhead that may be exposed to stormwater from the new subdivision is unquantifiable with any degree of certainty, as is the intensity of effects that any exposed individual may experience. However, the annual numbers of exposed individuals of either species are expected to be very low. Fall-run Chinook salmon and winter-run steelhead are modeled, but unconfirmed, in Trumpeter Creek. Therefore, any occurrence of either species in the action area is expected to be relatively infrequent and in very low numbers. Therefore, the individuals that may penetrate Trumpeter Creek far enough to approach the action area likely represent very small subsets of their respective cohorts. Further, the very small affected area suggests that the individuals that may enter the affected area would be a small subset of the very few individuals that enter the creek. Therefore, the annual numbers of juvenile Chinook salmon and steelhead that may be exposed to action-attributable stormwater effects would represent extremely small subsets of their respective cohorts, and the numbers of exposed fish would be too low to cause detectable population-level effects.

<u>Artificial illumination</u>

Artificial illumination from the HASC Family Housing project is likely to adversely affect PS Chinook salmon and PS steelhead. The new 1- to 3-story tall apartment buildings and the parking areas would have artificial lighting systems, which are undescribed. However, based on typical apartment complexes in the area, exterior security lights would likely be installed around the perimeter the new apartment buildings near the roof. Also, individual units would have door lights, and windows that would periodically transmit light to the outside. Light poles would likely be installed in numerous locations throughout the parking lots. Parking lot lights, and the lights and windows on the north, east, and south sides of the buildings would cause nighttime artificial illumination toward Trumpeter and College Way Creeks.

Tabor and Piaskowski (2002) report that juvenile Chinook salmon in lacustrine environments typically feed and migrate during the day, and are inactive at night, residing at the bottom in shallow waters. They tend to move off the bottom and become increasingly active at dawn when light levels reach 0.8 to 2.1 lumens per square meter. Tabor et al. (2017) found that sub-yearling Chinook, coho, and sockeye salmon exhibit strong nocturnal phototaxic behavior when exposed to levels of 5.0 to 50.0 lumens per square meter, with phototaxis positively correlated with light intensity. Celedonia and Tabor (2015) found that juvenile Chinook salmon in the Lake Washington Ship Canal were attracted to artificially lit areas at 0.5 to 2.5 lumens per square meter. The authors also reported that attraction to artificial lights may delay the onset of morning migration by up to 25 minutes for some juvenile Chinook salmon migration through the Lake Washington Ship Canal.

The NMFS recently completed a consultation for a bridge replacement project that included a lighting system designed to limit illumination of the water yet still meet roadway safety standards (NMFS 2019). That system was predicted to illuminate the water's surface along the sides of the bridge at 1.08 lumens per square meter, which exceeds the 0.5 lumen per square meter level where phototaxis has been documented in Chinook salmon (Celedonia and Tabor 2015).

In the absence of any information to describe the expected over-water light intensity from the housing project, the NMFS expects that the new apartments would include lighting systems similar to other apartment complexes. We further expect that, at some locations in the creeks that are adjacent to the housing site, the new lighting systems are likely to cause nighttime illumination of the water's surface above the 0.5 lumen per square meter threshold for the onset of daylight activities and phototaxis in fish. It is uncertain to what degree the new light would be detectable above background levels, or what additive effects the new lighting would have when considered with existing conditions and other new development that may occur in the area. However, based on the best available information and on the need to be protective of the listed fish, the NMFS estimates that any juvenile Chinook salmon and juvenile steelhead that are in Trumpeter and College Way Creeks immediately adjacent to the project site may experience some level of nocturnal phototaxis, and may experience other altered behaviors. Over the life of the new apartments, it is likely that a small subset of the exposed individuals would experience reduced fitness and/or altered behaviors that could reduce their overall likelihood of survival.

The annual numbers of PS Chinook salmon and PS steelhead that may be exposed to artificial lighting that would be attributable to the new apartments is unquantifiable with any degree of certainty, as is the intensity of any effects that an exposed individual may experience. However, for the same reasons expressed above for exposure to stormwater effects, the annual numbers of juvenile Chinook salmon and steelhead that may be exposed to artificial lighting that would be attributable to the new housing would represent extremely small subsets of their respective cohorts, and the numbers of exposed fish would be too low to cause detectable population-level effects.

2.6 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 conditions of ESA-listed species the action area are described in the Rangewide Status of the Species and Critical Habitat and Environmental Baseline sections above. The non-federal activities in and upstream of the action area that have contributed to those conditions include past and on-going upland urbanization, agriculture, road construction, water development, subsistence and recreational fishing, and restoration activities. Those actions were, and continue to be, 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 conservation groups dedicated to restoration and use of natural amenities, such as cultural inspiration and recreational experiences.

The NMFS is unaware of any specific future non-federal activities that are reasonably certain to affect the action area. However, the NMFS is reasonably certain that future non-federal actions such as the previously mentioned activities 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 development and chronic low-level inputs of non-point source pollutants will likely continue into the future. Recreational and commercial use of the waters within the action area are also likely to increase as the human population grows.

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 PS Chinook salmon and PS steelhead within many of the watersheds that surround 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.

2.7 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.

As described in more detail above in Section 2.4, climate change is likely to increasingly affect the abundance and distribution of the ESA-listed species considered in the opinion. It is also likely to increasingly affect the PBF of designated critical habitats. The exact effects of climate change are both uncertain, and unlikely to be spatially homogeneous. However, climate change is reasonably likely to cause reduced instream flows in some systems, and may impact water quality through elevated in-stream water temperatures and reduced dissolved oxygen, as well as by causing more frequent and more intense flooding events.

Climate change may also impact coastal waters through elevated surface water temperature, increased and variable acidity, increasing storm frequency and magnitude, and rising sea levels. The adaptive ability of listed-species is uncertain, but is likely reduced due to reductions in population size, habitat quantity and diversity, and loss of behavioral and genetic variation. The proposed action will cause direct and indirect effects on the ESA-listed species and critical habitats considered in the opinion well into the foreseeable future. However, the action's effects on water quality, substrate, and the biological environment are expected to be of such a small scale that no detectable effects on ESA-listed species or critical habitat through synergistic interactions with the impacts of climate change are expected.

2.7.1 ESA-listed Species

PS Chinook salmon and PS steelhead are both listed as threatened, 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. Both 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, the effects on viability parameters of each species are also likely to be negative. In this context we consider how the proposed action's impacts on individuals would affect the listed species at the population and ESU/DPS scales.

PS Chinook salmon

The long-term abundance trend of the PS Chinook salmon ESU is slightly negative. Reduced or eliminated accessibility to historically important habitat, combined with degraded conditions in available habitat due to land use activities appear to be the greatest threats to the recovery of PS Chinook salmon. Commercial and recreational fisheries also continue to impact this species.

The PS Chinook salmon most likely to occur in the action area would be fall-run Chinook salmon from the Lower Skagit River population, and part of the Whidbey Basin MPG. The total abundance trend across the basin has been slightly positive since the early 1990s, and the fraction of natural-origin spawners is over 90 percent.

The project site is located in Mount Vernon, Washington, immediately adjacent to Trumpeter Creek, in which PS Chinook salmon presence is modeled, but unconfirmed. The environmental baseline within the action area has been degraded by the effects of nearby urban development longstanding agricultural practices, and road building and maintenance.

There would be no project-related in-water work that would affect Chinook salmon. However, over the next several decades, extremely low numbers of juveniles that enter Trumpeter and College Way Creeks adjacent to the apartments are likely to be exposed to reduced water quality, contaminated forage, and altered lighting conditions as a result of this action. These stressors, both individually and collectively, are likely to cause a range of effects that would include some combination of altered behaviors, reduced fitness, and increased mortality in exposed individuals.

Based on the best available information, the scale of the direct and indirect effects of the proposed action, when considered in combination with the degraded baseline, cumulative effects, and the impacts of climate change, would be too small to cause detectable effects on any of the characteristics of a viable salmon population (abundance, productivity, distribution, or genetic diversity) for the affected PS Chinook salmon population. Therefore, the proposed action would not appreciably reduce the likelihood of survival and recovery of this listed species.

PS Steelhead

The long-term abundance trend of the PS steelhead DPS is negative, especially for natural spawners. Growth rates are currently declining at 3 to 10% annually for all but a few DIPs. The extinction risk for most DIPs is estimated to be moderate to high, and the DPS is currently considered "not viable". Reduced or eliminated accessibility to historically important habitat, combined with degraded conditions in available habitat due to land use activities appear to be the greatest threats to the recovery of PS steelhead. Fisheries activities also continue to impact this species.

The PS steelhead most likely to occur in the action area would be from the Nookachamps Creek Winter Run DIP. The viability of the Nookachamps River DIP is considered moderate, and the winter-run is identified as one of the largest populations in the PS steelhead DPS. However, the overall trend for the winter-run is slightly negative.

The project site is located in Mount Vernon, Washington, immediately adjacent to Trumpeter Creek, in which PS steelhead presence is modeled, but unconfirmed. The environmental baseline within the action area has been degraded by the effects of nearby urban development longstanding agricultural practices, and road building and maintenance.

There would be no project-related in-water work that would affect PS steelhead. However, over the next several decades, extremely low numbers of juveniles that enter Trumpeter and College Way Creeks adjacent to the apartments are likely to be exposed to reduced water quality, contaminated forage, and altered lighting conditions as a result of this action. These stressors, both individually and collectively, are likely to cause a range of effects that would include some combination of altered behaviors, reduced fitness, and increased mortality in exposed individuals.

Based on the best available information, the scale of the direct and indirect effects of the proposed action, when considered in combination with the degraded baseline, cumulative effects, and the impacts of climate change, would be too small to cause detectable effects on any of the characteristics of a viable salmon population (abundance, productivity, distribution, or genetic diversity) for the affected PS steelhead DIP. Therefore, the proposed action would not appreciably reduce the likelihood of survival and recovery of this listed species.

2.8 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 the NMFS' biological opinion that the proposed action is not likely to jeopardize the continued existence of PS Chinook salmon and PS steelhead.

2.9 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 incidental take statement (ITS).

2.9.1 Incidental Take Statement

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 runoff and
- Artificial illumination.

The 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 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 cannot be attributed entirely to habitat conditions, nor can the NMFS precisely predict the number of fish that are reasonably certain to be injured or killed if their habitat is modified or degraded by the proposed action. Additionally, the NMFS knows of no device or practicable technique that would yield reliable counts of individuals that may experience these impacts.

In such circumstances, the 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. For this action, the size and configuration of the applicant's apartment complex, and the design of the stormwater treatment system are the best available surrogates for the extent of take of juvenile PS Chinook salmon and juvenile PS steelhead from exposure to stormwater runoff. The best available surrogate for the extent of take of juvenile PS Chinook salmon juvenile PS steelhead from exposure to artificial illumination is the size and configuration of the applicant's apartment complex.

The size and configuration of the applicant's apartment complex, and the design of the stormwater treatment system are the best available surrogates for exposure to stormwater runoff because the volume of stormwater would be directly related to the amount of impervious surface area (i.e. sizes of driveways, parking areas, and rooftops). Also, the amount of traffic-related contaminants in the stormwater would be directly related to the number of vehicles that would use the driveways and parking areas, which is directly related to the number of apartments and the sizes of the parking areas. Any increase in the volume of contaminated stormwater or in the concentration of the contaminants within it would increase in the amount of contaminants that enter the adjacent creeks. The design of the stormwater treatment system is an appropriate surrogate because the concentration of contaminants that would remain in post-treatment stormwater is directly related to the system's level of contaminant removal, and to the system's ability to manage flows before bypass of treatment occurs. Lower levels of contaminant removal and/or bypass of the filter system at lower flow levels would also increase the amount of contaminants that enter the creeks. Any increase in the amount of contaminants that enter the creeks could increase the number of individuals that would be exposed to them and/or increase the intensity of the impacts from the exposure (directly or through the trophic web).

The size and configuration of the applicant's apartment complex are best available surrogates for the extent of take of juvenile PS Chinook salmon and juvenile PS steelhead from exposure to artificial illumination for a number of reasons. Increasing the size of the buildings is likely to increase the number of lights, which is likely to increase the intensity of the on-water illumination. Increasing the height of the buildings would increase the distance that the light would extend over the creeks. Constructing the buildings and parking areas closer to the creeks is also likley to increase the intensity of the on-water illumination. Increasing the intensity of the in-water illumination would increase the intensity of phototaxis in exposed individuals, and increasing the size of the on-water illuminated area would increase the number of exposed individuals.

In summary, the extent of PS Chinook salmon and PS steelhead take for this action is defined as:

- The size and configuration of the new apartment complex, as described in the proposed action section of this biological opinion; and
- The discharge of stormwater through the stormwater management and treatment system, as described in the proposed action section of this biological opinion.

Exceedance of any of the exposure limits described above would constitute an exceedance of authorized take that would trigger the need to reinitiate consultation.

Although these take surrogates could be construed as partially coextensive with the proposed action, they nevertheless function as effective reinitiation triggers. If any of these take surrogates exceed the proposal, it could still meaningfully trigger reinitiation because the Skagit County Public Health (SCPH) has authority to conduct compliance inspections and to take actions to address non-compliance, including post-construction (33 CFR 326.4).

2.9.2 Effect of the Take

In the biological opinion, the 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.

2.9.3 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).

The SCPH shall require the Housing Authority of Skagit County (HASC) to:

1. Ensure the implementation of monitoring and reporting to confirm that the take exemption for the proposed action is not exceeded.

2.9.4 Terms and Conditions

The terms and conditions described below are non-discretionary. The SCPH or any applicant must comply with them in order to implement the RPMs (50 CFR 402.14). The SCPH 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:
    a. The SCPH shall require the HASC to develop and implement plans to collect and report details about the take of listed fish. That plan shall:
        i. Require the HASC and/or their contractor to maintain and submit records to verify that all take indicators are monitored and reported. Minimally, the records should include:
            1. Documentation to verify that the size and configuration of the apartment complex does not exceed the conditions described in this biological opinion; and
            2. Documentation to verify that the stormwater management and treatment system matches the system described in this biological opinion.
        ii. Require the HASC to submit an electronic post-construction report to the NMFS within six months of project completion. Send the report to: projectreports.wcr@noaa.gov. Be sure to include Attn: WCRO-2021-00134 in the subject line.

2.10 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).

1. The SCPH should require the HASC to develop and implement a long-term source-control plan for the apartment complex to reduce the amount of contaminants in stormwater. The plan should include measures such as:
   a. The prohibition of automobile maintenance activities in the parking areas;
   b. The installation of signage designed to prevent the dumping of pollutants into storm drains;
   c. The required periodic inspection and cleaning of spilled oils in the driveways and parking areas; and
   d. The required periodic street sweeping/vacuuming of the driveways and parking areas.

2. The SCPH should require the HASC to install external lighting systems that are designed to meet safety needs while minimizing nighttime illumination of the adjacent creeks. Suggested measures include:
   a. Install shielding for all external elevated light fixtures;
   b. Aim all external elevated light fixtures in a manner that prevents over-water illumination; and
   c. Install low-intensity lights.

2.11 Reinitiation of Consultation

This concludes formal consultation for the SCPH's HASC Family Housing Project in Skagit County, 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.

2.12 "Not Likely to Adversely Affect" Determinations

This assessment was prepared pursuant to section 7(a)(2) of the ESA, implementing regulations at 50 CFR 402 and agency guidance for preparation of letters of concurrence.

As described in section 1.2 and below, the NMFS has concluded that the proposed action would be not likely to adversely affect southern resident (SR) killer whales and their designated critical habitat. Detailed information about the biology, habitat, and conservation status and trends of SR killer whales can be found in the listing regulations and critical habitat designations published in the Federal Register, as well as in the recovery plans and other sources at: https://www.fisheries.noaa.gov/species-directory/threatened-endangered, and are incorporated here by reference.

The applicable standard to find that a proposed action is not likely to adversely affect listed species or critical habitat is that all of the effects of the action are expected to be discountable, insignificant, or completely beneficial. Beneficial effects are contemporaneous positive effects without any adverse effects to the species or critical habitat. Insignificant effects relate to the size of the impact and should never reach the scale where take occurs. Discountable effects are those extremely unlikely to occur. The effects analysis in this section relies heavily on the descriptions of the proposed action and project site conditions discussed in Sections 1.3 and 2.4, and on the effects analyses presented in Section 2.5.

2.12.1 Effects on Listed Species

SR killer whales are limited to marine water habitats, and would not be directly exposed to any project-related direct effects. Further, the action is extremely unlikely to cause detectable indirect effects on SR killer whales through trophic impacts. As described in Section 2.5, the proposed action would annually affect too few individuals to cause detectable population-level affects in PS Chinook salmon, which are they main prey species for SR killer whales. Therefore, the proposed action would cause no detectable reduction in Chinook salmon availability for SR killer whales. Therefore, the action is not likely to adversely affect SR killer whales.

2.12.2 Effects on Critical Habitat

This assessment considers the intensity of expected effects in terms of the change they would cause in affected PBFs from their baseline conditions, and the severity of each effect, considered in terms of the time required to recover from the effect. Ephemeral effects are those that are likely to last for hours or days, short-term effects would likely to last for weeks, and long-term effects are likely to last for months, years or decades.

PS Steelhead Critical Habitat: The closest designated critical habitat for PS steelhead is in Nookachamps Creek, well over 3,000 feet downstream from the farthest extent of the action's detectable effects on freshwater fish, aquatic organisms, and other freshwater habitat resources. Therefore, the proposed action is not likely to adversely affect PS steelhead critical habitat.

SR killer whale Critical Habitat: Designated critical habitat for SR killer whales includes marine waters of the Puget Sound that are at least 20 feet deep. The expected effects on SR killer whale critical habitat from completion of the proposed action, including full application of the conservation measures and best management practices (BMPs), would be limited to the impacts on the PBF as described below.

1. <u>Water quality to support growth and development</u>
   The proposed action would cause no detectable effects on marine water quality.

2. <u>Prey species of sufficient quantity, quality, and availability to support individual growth, reproduction, and development, as well as overall population growth</u>
   The proposed action would cause long-term undetectable effects on prey availability. Action-related impacts would annually injure or kill extremely low numbers of juvenile Chinook salmon (primary prey). However, the annual numbers of lost individuals would be too small to cause detectable effects on prey availability for SR killer whales.

3. <u>Passage conditions to allow for migration, resting, and foraging</u>
   The proposed action would cause no detectable effects on passage conditions.

Therefore, the proposed action is not likely to adversely affect SR killer whale critical habitat.

For the reasons expressed immediately above, the NMFS concurs with the SCPH's determination that the proposed action is not likely to adversely affect ESA-designated PS steelhead critical habitat, and ESA-listed SR killer whales and their designated critical habitat.

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

Section 305(b) of the MSA directs Federal agencies to consult with the NMFS on all actions or proposed actions that may adversely affect EFH. Under the MSA, this consultation is intended to promote the conservation of EFH as necessary to support sustainable fisheries and the managed species' contribution to a healthy ecosystem. For the purposes of the MSA, EFH means "those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity", and includes the physical, biological, and chemical properties that are used by fish (50 CFR 600.10). 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) of the MSA also requires the NMFS to recommend measures that can be taken by the action agency to conserve EFH. Such recommendations may include measures to avoid, minimize, mitigate, or otherwise offset the adverse effects of the action on EFH [CFR 600.905(b)].

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

3.1 Essential Fish Habitat Affected By the Project

The project site is located in Mount Vernon, Washington, immediately adjacent to Trumpeter and College Way Creeks (Figure 1). The waters and substrate of these creeks are designated as freshwater EFH for various life-history stages of Pacific Coast Salmon, which within these creeks include coho salmon, and may include Chinook and pink salmon. The action area also overlaps with marine waters that have been designated, under the MSA, as EFH for Pacific Coast Salmon, Pacific Coast Groundfish, and Coastal Pelagic Species. However, the action would cause no detectable effects on any components of marine EFH. Therefore, the effects of the action would be limited to impacts on freshwater EFH for Pacific Coast Salmon, and it would not adversely affect marine EFH for Pacific Coast Salmon, or EFH for Pacific Coast groundfish and coastal pelagic species.

Freshwater EFH for Pacific salmon is identified and described in Appendix A to the Pacific Coast salmon fishery management plan, and consists of four major components: (1) spawning and incubation; (2) juvenile rearing; (3) juvenile migration corridors; and (4) adult migration corridors and holding habitat.

Those components of freshwater EFH for Pacific Coast Salmon depend on habitat conditions for spawning, rearing, and migration that include: (1) water quality (e.g., dissolved oxygen, nutrients, temperature, etc.); (2) water quantity, depth, and velocity; (3) riparian-stream-marine energy exchanges; (4) channel gradient and stability; (5) prey availability; (6) cover and habitat complexity (e.g., large woody debris, pools, aquatic and terrestrial vegetation, etc.); (7) space; (8) habitat connectivity from headwaters to the ocean (e.g., dispersal corridors); (9) groundwater-stream interactions; and (10) substrate composition.

As part of Pacific Coast Salmon EFH, five Habitat Areas of Particular Concern (HAPCs) have been defined: 1) complex channels and floodplain habitats; 2) thermal refugia; 3) spawning habitat; 4) estuaries; and 5) marine and estuarine submerged aquatic vegetation. The action area provides no known HAPC habitat features.

3.2 Adverse Effects on Essential Fish Habitat

The ESA portion of this document (Sections 1 and 2) describes the proposed action and its adverse effects 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 minor short- and long-term adverse effects on EFH for Pacific Coast Salmon as summarized below.

1. <u>Water quality:</u> – The proposed action would cause minor long-term adverse effects on this attribute. The discharge of treated stormwater from the new housing project would episodically introduce low levels of contaminants into Trumpeter and College Way Creeks. Detectable effects would be limited to the creeks within about 300 feet of the northeast corner of the housing site. No changes in water temperature are expected.

2. <u>Water quantity, depth, and velocity:</u> – No changes expected.

3. Riparian-stream-marine energy exchanges: – No changes expected.

4. Channel gradient and stability: – No changes expected.

5. Prey availability: – The proposed action would cause long term minor adverse effects on prey availability. The discharge of treated stormwater from the new housing project would slightly increase contamination in the invertebrate prey organisms within about 300 feet of the northeast corner of the housing site.

6. Cover and habitat complexity: – No changes expected.

7. Water quantity: – No changes expected.

8. Space: – No changes expected.

9. Habitat connectivity from headwaters to the ocean: – No changes expected.

10. Groundwater-stream interactions: – No changes expected.

11. Connectivity with terrestrial ecosystems: – No changes expected.

12. Substrate composition: – No changes expected.

3.3 Essential Fish Habitat Conservation Recommendations

The proposed action includes design features, conservation measures, and BMPs that are expected to reduce and help offset action-related impacts on the quantity and quality of Pacific Coast salmon EFH, including providing high-level treatment for all stormwater that would come from the new housing area. However, full implementation of the following EFH conservation recommendation would further protect about 0.1 acre of designated EFH for Pacific Coast salmon by avoiding or minimizing the adverse effects described in section 3.2 above.

1. To reduce adverse impacts on water quality and prey availability, the SCPH should require the HASC to develop and implement a long-term source-control plan for the apartment complex to reduce the amount of contaminants in stormwater. The plan should include measures such as:
   a. The prohibition of automobile maintenance activities in the parking areas;
   b. The installation of signage designed to prevent the dumping of pollutants into storm drains;
   c. The required periodic inspection and cleaning of spilled oils in the driveways and parking areas; and
   d. The required periodic street sweeping/vacuuming of the driveways and parking areas.

3.4 Statutory Response Requirement

As required by section 305(b)(4)(B) of the MSA, the SCPH must provide a detailed written response in to the 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 the NMFS' EFH Conservation Recommendations unless the 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 the 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, the 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

The SCPH must reinitiate EFH consultation with the 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 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 user of this opinion is the SCPH. Other interested users could include the HASC, WDFW, the governments and citizens of Skagit County and the City of Mount Vernon, and Native American tribes. An individual copy of this opinion was provided to the SCPH. 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 the 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.

5. REFERENCES

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