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

Refer to NMFS No: WCRO-2021-02377

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March 14, 2022

Janice Roderick
State Environmental Coordinator
USDA Rural Development
U.S. Department of Agriculture
1835 Black Lake Blvd SW, Suite B
Olympia, WA 98512

Re: Endangered Species Act Section 7(a)(2) Biological Opinion for the City of College Place Wastewater Treatment Plant Upgrade Project, Garrison Creek, tributary to the Walla Walla River (170701020704), College Place, Washington.

Dear Ms. Roderick:

Thank you for your September 24, 2021, letter 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 City of College Place Wastewater Treatment Plant Upgrade Project. The U.S. Department of Agriculture Rural Development proposes to provide financial assistance to the city of College Place in Walla Walla County, Washington, under its Water and Waste Disposal Loans and Grants Program. The purpose of the funding is to replace components at their wastewater treatment facility, construct a new effluent storage lagoon, and expand their land application area by approximately 60 acres.

After reviewing the current status of the species, the environmental baseline, the effects of the proposed action, and the cumulative effects, NMFS concludes that the proposed project is not likely to jeopardize the continued existence of ESA-listed Middle Columbia River (MCR) steelhead (*Oncorhynchus mykiss*). NMFS also determined the action will not destroy or adversely modify designated critical habitat for MCR steelhead. We provide rationale for our conclusions in the attached biological opinion (opinion). The enclosed opinion is based on information provided in your biological assessment, requested additional information provided by Tyler Schade with J-U-B Engineers, Inc., and other sources of information cited in the opinion.

As required by section 7 of the ESA, NMFS provided an incidental take statement (ITS) with the opinion. The ITS includes reasonable and prudent measures (RPMs) that NMFS considers necessary or appropriate to minimize incidental take associated with the proposed action. The take statement sets forth terms and conditions, including reporting requirements that the U.S.

Department of Agriculture and any person who performs the action must comply with to carry out the RPMs. Incidental take from the proposed action that meets these terms and conditions will be exempt from the ESA take prohibition.

Please contact Colleen Fagan, Interior Columbia Basin Office, La Grande, Oregon, (541) 962-8512 or colleen.fagan@noaa.gov, if you have any questions concerning this consultation, or if you require additional information.

Sincerely,

Michael P. Tehan
Assistant Regional Administrator
Interior Columbia Basin Office

Enclosure

cc: [*File*]
Tyler Schade – J-U-B Engineers Inc.
Jeff Krupka – USFWS
Katherine Sarensen – USFWS
Gary James – CTUIR
Mike Lambert – CTUIR
Dave Karl – WDFW

Endangered Species Act (ESA) Section 7(a)(2) Biological Opinion

City of College Place Wastewater Treatment Plant Upgrade Project

NMFS Consultation Number: WCRO-2021-02377

Action Agency: U.S. Department of Agriculture, Washington State Office

Affected Species and NMFS' Determinations:

ESA-Listed Species	Status	Is Action Likely to Adversely Affect Species?	Is Action Likely To Jeopardize the Species?	Is Action Likely to Adversely Affect Critical Habitat?	Is Action Likely To Destroy or Adversely Modify Critical Habitat?
Middle Columbia River steelhead (*Oncorhynchus mykiss*)	Threatened	Yes	No	Yes	No

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

Issued by: _____

Assistant Regional Administrator
Interior Columbia Basin Office

Date: March 14, 2022

TABLE OF CONTENTS

TABLE OF TABLES

TABLE OF FIGURES

ACRONYM GLOSSARY

BA	Biological Assessment
BMPs	Best Management Practices
cfs	Cubic Feet per Second
CHART	Critical Habitat Analytical Review Team
City	City of College Place
Corps	U.S. Army Corps of Engineers
CTUIR	Confederated Tribes of the Umatilla Indian Reservation
DPS	Distinct Population Segment
DQA	Data Quality Act
ESA	Endangered Species Act
ESU	Evolutionarily Significant Unit
FR	Federal Register
HUC5	Fifth-Field Hydrologic Unit Code
ICRD	Interior Columbia Recovery Domain
ICTRT	Interior Columbia Basin Technical Recovery Team
ITS	Incidental Take Statement
MCR	Middle Columbia River
MPG	Major Population Group
NMFS	National Marine Fisheries Service
NPDES	National Pollutant Discharge Elimination System
NWFSC	Northwest Fisheries Science Center
OHWM	Ordinary High Water Mark
Opinion	Biological Opinion
PAH	Polycyclic Aromatic Hydrocarbon
PBC	Polychlorinated Biphenyls
PBF	Physical or Biological Features
PCE	Primary Constituent Element
RPM	Reasonable and Prudent Measure
SS/D	Spatial Structure and Diversity
TMDL	Total Maximum Daily Load
USDA	U.S. Department of Agriculture
USFWS	U.S. Fish and Wildlife Service
VSP	Viable Salmonid Population
WDFW	Washington Department of Fish and Wildlife
WWTP	Wastewater Treatment Plant

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

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

1.2. Consultation History

NMFS received the U.S. Department of Agriculture's (USDA) request for formal consultation and a biological assessment (BA) on September 24, 2021. USDA Rural Development proposes to provide financial assistance to the city of College Place (City) in Walla Walla County, Washington, under its Water and Waste Disposal Loans and Grants Program to upgrade its wastewater treatment facility, construct a new effluent storage lagoon, and expand their land application area by approximately 60 acres. The USDA concluded that the proposed action "May affect, but is unlikely to adversely affect" Middle Columbia River (MCR) steelhead (*Oncorhynchus mykiss*) and its designated critical habitat. NMFS requested additional information on project components, site isolation and dewatering, fish salvage, vegetation removal, and in-channel work by letter on October 14, 2021. We received the requested information on October 26, 2021. In October 2021, NMFS also communicated by email or phone with Gary James and Travis Olsen of the Confederated Tribes of the Umatilla Indian Reservation (CTUIR), David Karl of Washington Department of Fish and Wildlife (WDFW), Ben Tice of the U.S. Army Corps of Engineers (Corps), Eric Hoverson of the Walla Walla Basin Watershed Council, and Judith Johnson of Kooskooskie Commons, regarding MCR steelhead use and anticipated flow in the project area during the in-water work window. NMFS initiated consultation on October 26, 2021.

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). USDA proposes to fund the City's wastewater treatment plant upgrade project on Garrison Creek in the Walla Walla Basin (Figure 1). The project includes: (1) replacement of the existing screen and compactor; (2) rehabilitation of the existing grit removal system; (3) upgrading the sequence batch reactor air piping; (4) replacement of below-ground piping and construction of above-ground piping;

(5) expansion of the existing equalization storage tank; (6) construction of a new ultraviolet disinfection facility; (7) construction of an effluent pump station and water pumps; (8) construction of a new drain pump and piping; (9) construction of an irrigation pump station; (10) expansion of the irrigation distribution system and land application area by approximately 60 acres; and (11) installation of groundwater monitoring wells. Pipeline installation will require excavating an open trench and cofferdam system to divert water around the work area at two locations in Garrison Creek. All other construction work will occur above the ordinary high water mark (OHWM) and away from Garrison Creek (Figure 2).

1.3.1. Access and Staging

Equipment will access the project area and all work sites using existing roads and bridges. One staging area, 50 feet north of Garrison Creek, will be used for project construction (Figure 3).

1.3.2. Dewatering and Fish Salvage

Garrison Creek may be dry during project construction. If water is present, the two in-water work areas, west and east creek crossings, will be isolated with cofferdams, dewatered, and fish will be salvaged. The cofferdam systems will be constructed with water-filled bladders or super sacks of clean, washed gravels. Water will be pumped around each work area and released over land at a slow rate, far enough from the existing channel to avoid surface erosion and to prevent water returning to the channel before percolation. Pumps will be screened with 3/32-inch mesh to prevent fish entrainment and impingement. The contractor will be required to maintain turbidity at levels low enough so that the water clears up within 100 feet downstream of each work area. Approximately 3,000 square feet at the west creek crossing and 1,500 square feet at the east creek crossing will be isolated, dewatered, and have fish salvaged. Each in-water work area will be isolated separately, and dewatered for approximately 5 days.

A qualified fisheries biologist will oversee fish salvage. Fish will be herded to outside the work area with seines. Electrofishing will not occur. If fish handling is needed, the fisheries biologist will follow NMFS guidelines and methods included in the Washington Department of Transportation's *Fish Exclusion Protocols and Standards* (September 2016). The fisheries biologist will determine fish release locations based on current water levels and habitat condition. Releases will occur upstream or downstream of work areas. Reporting of salvaged fish will include documentation of salvage location, fish species, number, age/size class estimate, condition at release, and release location.

After project construction is completed, water will slowly be reintroduced to isolated work areas. To prevent erosion and minimize turbidity plumes, the upstream and downstream edges of the cofferdam will be removed in a way to prevent turbid water from rushing downstream (i.e., slowly remove downstream portion, then slowly remove upstream portion so water flows through in a slow, controlled manner to reduce turbidity). Garrison Creek will be restored to pre-project conditions with the appropriate gradation of streambed material.

Figure 1. Location of the City of College Place Wastewater Treatment Plant Upgrade Project in the Walla Walla Basin.

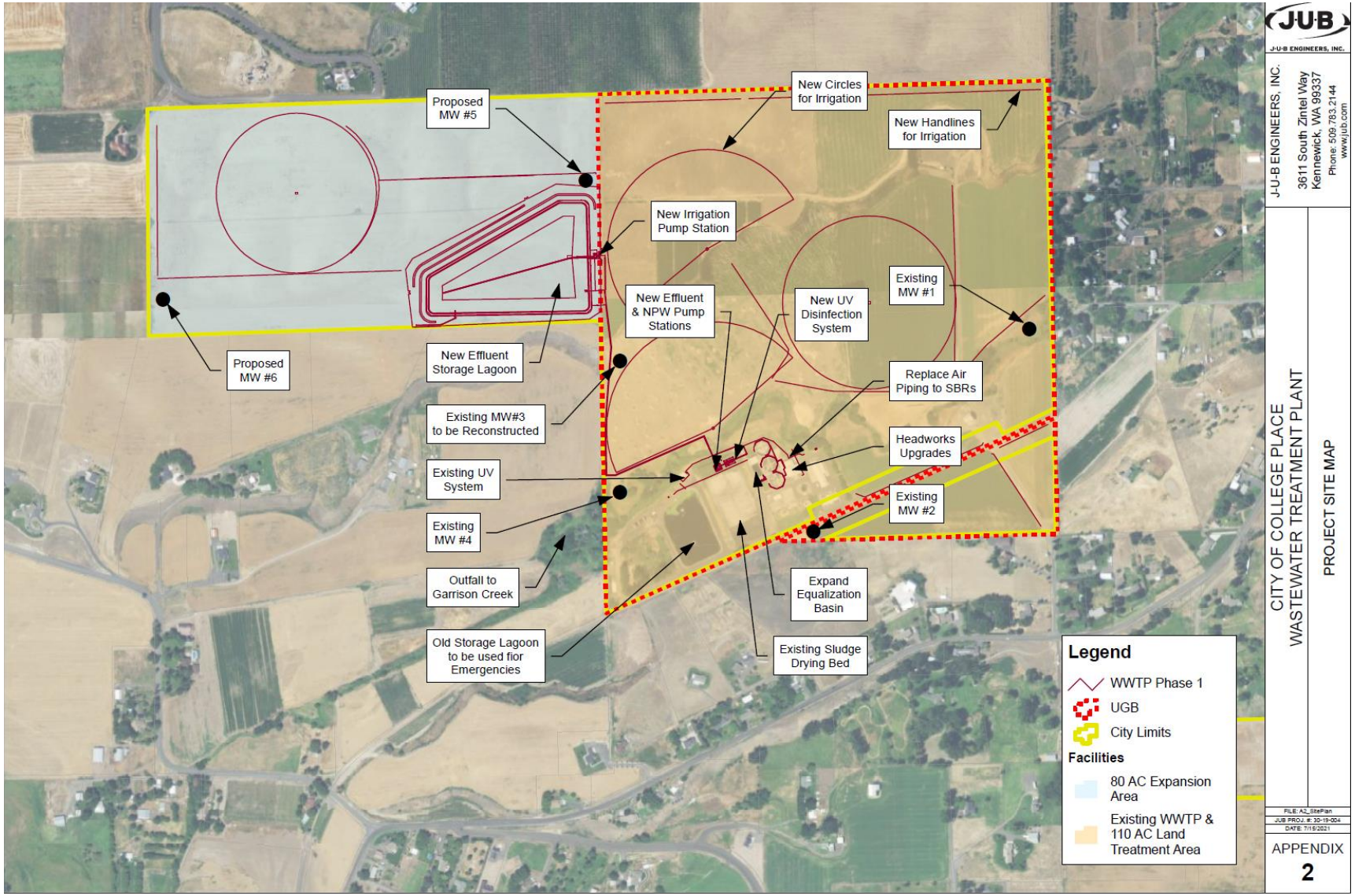

Figure 2. City of College Place Wastewater Treatment Plant Upgrade project components and location of existing and proposed groundwater monitoring wells.

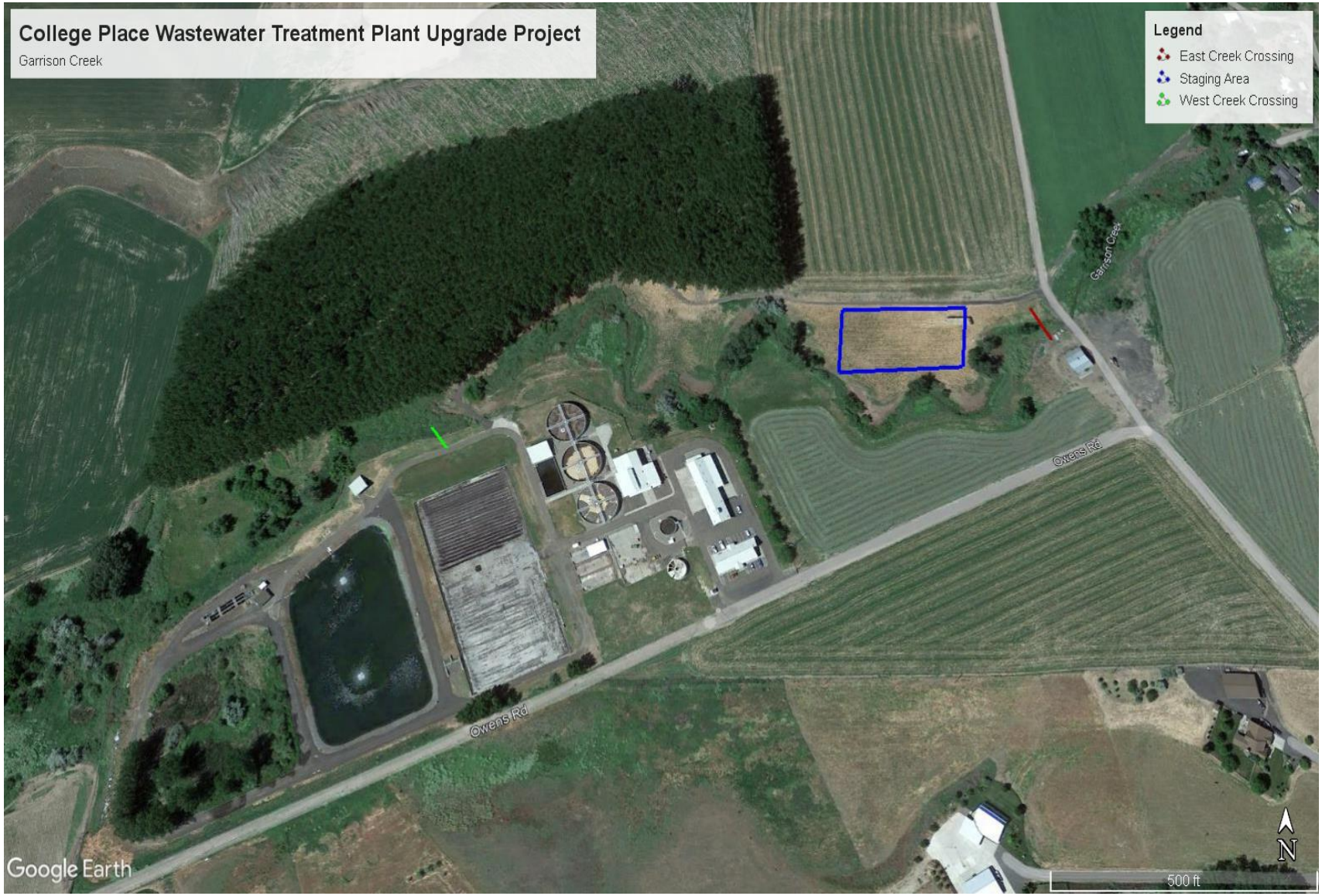

Figure 3. Location of staging area and east and west stream crossings for the College Place Wastewater Treatment Plant Upgrade Project on Garrison Creek.

1.3.3. Project Construction

A track-mounted excavator will be used to excavate the trenches in the channel bed. Three parallel pipelines (two 6-inch diameter and one 12-inch diameter) will be installed crossing Garrison Creek at the west creek crossing and a single 10-inch diameter pipe will be installed crossing Garrison Creek at the east creek crossing, approximately two feet below the channel bed surface. The pipes will be installed in a 7-foot 3-inch wide open-cut trench excavated across the creek at the west crossing and in a 2-foot 10-inch wide open-cut trench excavated at the east crossing (Figure 3). Both crossings are located adjacent to and downstream of existing culverts for driveways that cross the creek. Approximately 3,000 square feet at the west creek crossing and 1,500 square feet at the east creek crossing will be impacted by construction and dewatering. After construction, the impacted creek bed will be returned to its natural condition with native material placement. Construction activity will occur during the in-water work window July 15-September 30, of 2022 or 2023.

The following materials will be installed in the stream channel (quantities are approximate):

1. West creek crossing: 4 cubic yards of rock foundation material for trench foundation, 12 square yards of filter fabric above the foundation material, 8 cubic yards of 3/4-inch minus crushed surfacing rock as pipe zone bedding, 30 lineal feet of 6-inch diameter PVC pipe, 15 lineal feet of 12-inch diameter PVC pipe, one 6-inch ductile iron pipe with 22.5 degree bend, and 16 cubic yards of native material trench backfill.

2. East creek crossing: 1 cubic yard of rock foundation material for trench foundation, 3 square yards of filter fabric above the foundation material, 2 cubic yards of 3/4-inch minus crushed surfacing rock as pipe zone bedding, 10 lineal feet of 10-inch diameter PVC pipe, and 2 cubic yards of native material trench backfill.

Approximately 0.10 acres of riparian habitat consisting of reed canary grass and Himalayan blackberry, with a small amount of Fuller's teasel and poison hemlock will be impacted during project construction. Impacted riparian habitat will be replaced at a 1:1 ratio using native trees and shrubs.

1.3.4. Best Management Practices and Conservation Measures

Best management practices (BMPs) and conservation measures will be implemented, including:

1. All work will be completed within the designated project footprint and during established working hours.

2. Construction equipment and vehicles will be fueled offsite and adequately buffered from riparian zones and aquatic areas.

3. To prevent the transportation of invasive species, all equipment will be pressure washed to remove plant parts, soil, and other materials that may carry invasive and noxious weed seeds prior to arriving at the project site.

4. The Contractor shall provide the engineer with the opportunity to inspect the equipment prior to unloading at the construction site. If upon inspection dirt, debris, and seeds are visible, the equipment will be immediately removed and rewashed. The equipment will then be re-inspected at the site to ensure that it is clean.

5. Adequate spill response equipment (i.e., spill kits and cleanup materials) will be maintained and present onsite at all times to minimize chemical contamination in the event of a spill. All spills will be cleaned up immediately.

    a. When not in use, construction equipment will be stored away from concentrated flows of stormwater, drainage courses, and inlets.

    b. Equipment will be parked over plastic sheeting, or an equivalent, wherever possible. Plastic will not be considered a substitute for drip pans or absorbent pads. Hydraulic equipment will be protected from runoff by placing them on plywood and covering them with plastic or a comparable material prior to the onset of rain.

    c. Contractor will follow proper storage, handling, use, and disposal of petroleum products and other hazardous materials.

6. All areas of ground disturbance will be rehabilitated. This includes spreading of stockpiled materials, seeding, and/or planting with native seed mixes or plants when appropriate.

7. Disturbed areas within riparian zones will be revegetated with riparian vegetation using native plants; disturbed areas will be reseeded with temporary erosion control mulch tackifier and/or native seed mix (certified 99.9 percent noxious weed-free seed) to provide stabilization, eliminate erosion concerns, and create vegetative recruitment opportunities.

8. Temporary Erosion and Sediment Controls, such as silt fences, fiber wattles, or other erosion control mechanisms will be placed adjacent to, or below, disturbance areas to prevent and minimize sediment transport into any waterway. Erosion control materials will be certified weed free in order to prevent the spread of noxious weeds. Sediment control devices will be maintained throughout construction activities that could result in erosion or sedimentation, as determined by the site foreman/engineer. When the risk of erosion has passed, the devices will be removed, and sediment will be disposed of in an upland location outside of the floodplain or transported off-site.

9. Construction activities will not occur during extreme wet weather conditions, if practicable. If heavy precipitation is predicted to occur within 24 hours, appropriate measures will be taken to cover up any stockpiles and check that erosion and sediment controls are in good condition.

10. During extreme weather events, temporary sediment traps, filter fabric fences, inlet protectors, vegetative filters and buffers, or settling basins will be used to retain runoff water long enough for sediment particles to settle out. Construction materials, including

topsoil and chemicals, will be stored covered, and isolated to prevent runoff losses and contamination of groundwater.

11. To minimize potential impacts, all work will, when possible, be completed from the existing roadway, shoulders, and upland areas.

12. If required, a U.S. Environmental Protection Agency Construction General Permit will be obtained for this Project, and a Stormwater Pollution Prevention Plan will be developed and implemented.

13. All associated permit conditions will be met during construction operations.

14. No uncured concrete or form materials will be allowed to enter the active stream channel.

BMPs associated with the preservation and retention of existing vegetation:

1. Areas where vegetation is to be protected will be clearly marked, flagged, or fenced.

2. Appropriate buffer zones will be established to protect sensitive vegetation (i.e., native riparian vegetation). Berms, fencing, signs, etc. will be used to demarcate the buffer limits.

3. Construction staging areas, waste areas, etc. will be located away from sensitive vegetation and 200 feet from any surface water, if possible.

4. Undisturbed areas will be maximized within project boundaries wherever possible to retain vegetation for erosion control purposes.

5. Native site vegetation and plant communities will be protected.

We considered, under the ESA, whether or not the proposed action would cause any other activities and determined that it would not.

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

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

that specifies the impact of any incidental taking and includes reasonable and prudent measures (RPMs) and terms and conditions to minimize such impacts.

2.1. Analytical Approach

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

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

The designation of critical habitat for MCR steelhead uses the term primary constituent element (PCE) or essential features. The 2016 final rule (81 FR 7414; February 11, 2016) that revised the 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 ESA Section 7 implementing regulations define effects of the action using the term "consequences" (50 CFR 402.02). As explained in the preamble to the final rule revising the definition and adding this term (84 FR 44976, 44977; August 27, 2019), that revision 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:

1. Evaluate the rangewide status of the species and critical habitat expected to be adversely affected by the proposed action.

2. Evaluate the environmental baseline of the species and critical habitat.

3. Evaluate the effects of the proposed action on species and their habitat using an exposure-response approach.

4. Evaluate cumulative effects.

5. 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.

6. If necessary, suggest a reasonable and prudent alternative to the proposed action.

2.2. Rangewide Status of the Species and Critical Habitat

In this opinion, we examine the status of MCR steelhead, which is likely to be adversely affected by the proposed action. The status is determined by the level of extinction risk that the listed species faces, 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. We also examine the condition of critical habitat throughout the designated area, evaluate the conservation value of the various watersheds and coastal and marine environments that make up the designated area, and discuss the function of the PBFs that are essential for the conservation of the species.

2.2.1. Status of the Species

For Pacific salmon and steelhead, we commonly use the four "viable salmonid population" (VSP) criteria (McElhany et al. 2000) to assess the viability of the populations that, together, 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 (McElhany et al. 2000).

"Abundance" generally refers to the number of naturally-produced adults (i.e., the progeny of naturally-spawning parents) in the natural environment (e.g., on spawning grounds).

"Productivity", as applied to viability factors, refers to the entire life cycle (i.e., 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 declining. McElhany et al. (2000) use the terms "population growth rate" and

"productivity" interchangeably when referring to production over the entire life cycle. They also refer to "trend in abundance", which is the manifestation of long-term population growth rate.

For species with multiple populations, once the biological status of a species' populations has been determined, we assess the status of the entire species 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).

The summary that follows describes the status of MCR steelhead and its designated critical habitat. MCR steelhead is the only ESA-listed species that occurs within the geographic area of this proposed action and considered in this opinion. More detailed information on the status and trends of this listed resource, and its biology and ecology, are in the listing regulations and critical habitat designations published in the Federal Register (FR) (Table 1), the most recent draft 5-year status review (NMFS 2022), applicable recovery plan (NMFS 2009), and the viability analysis prepared by the Northwest Fisheries Science Center (NWFSC) for the status review (NWFSC 2022). These additional documents are incorporated by reference and are available on the NMFS West Coast Region website (https://www.westcoast.fisheries.noaa.gov/).

Table 1. Listing status, status of critical habitat designation and protective regulations, and relevant Federal Register decision notices for Endangered Species Act-listed Middle Columbia River steelhead considered in this opinion.

Species	Listing Status	Critical Habitat	Protective Regulations
Middle Columbia River Steelhead (*Oncorhynchus mykiss*)	Threatened 3/25/1999; 64 FR 14517 Reaffirmed 5/26/2016; 81 FR 33458	9/02/05; 70 FR 52630	6/28/05; 70 FR 37160

Life History

The MCR steelhead distinct population segment (DPS) includes 16 summer-run populations and four winter-run populations. MCR summer steelhead enter freshwater (the Columbia River) between May and October and require several months to mature before spawning in late winter through spring. Winter steelhead enter freshwater between November and April and spawn shortly thereafter. Summer steelhead usually spawn further upstream than winter steelhead. Steelhead in the Walla Walla Basin are summer-run. Fry emergence typically occurs between May and August dependent on water temperature. Some juveniles move downstream to rear in larger tributaries and mainstem rivers. Most steelhead smolt at 2 years and adults return to the Columbia River after spending 1 to 2 years at sea (NMFS 2009).

Steelhead are iteroparous, meaning they can spawn more than once. Repeat spawning for Columbia River Basin steelhead ranges from reported rates of 2 to 4 percent above McNary Dam (Busby et al. 1996).

Spatial Structure and Diversity

This species includes all naturally-spawned steelhead populations originating below natural and manmade impassable barriers from the Columbia River and its tributaries upstream and exclusive of the Wind River in Washington and the Hood River in Oregon, to and including the Yakima River in Washington, excluding steelhead originating from the Snake River Basin. The Interior Columbia Basin Technical Recovery Team (ICTRT) identified 17 extant and three extirpated populations in this DPS (ICTRT 2003; McClure et al. 2005). The populations fall into four Major Population Groups (MPGs): Cascade eastern slope tributaries (five extant and two extirpated populations), the John Day River (five extant populations), the Walla Walla and Umatilla rivers (three extant and one extirpated populations), and the Yakima River (four extant populations) (ICTRT 2003; McClure et al. 2005). Steelhead in Garrison Creek are part of the Walla Walla River population, which is part of the Umatilla/Walla Walla MPG.

This DPS includes steelhead from seven artificial propagation programs (USDOC 2014). The DPS does not currently include steelhead that are designated as part of an experimental population above the Pelton Round Butte Hydroelectric Project in the Deschutes River Basin, Oregon (USDOC 2013). NMFS has defined the steelhead DPSs to include only the anadromous members of this species (70 FR 67130).

Abundance and Productivity

During the most recent draft status review and viability analysis (NWFSC 2022; NMFS 2022), NMFS determined that there has been functionally no change in the viability ratings for the component populations, and the MCR steelhead DPS does not currently meet the viability criteria described in the Middle Columbia River Steelhead Recovery Plan. In addition, several of the factors cited by the 2005 Biological Review Team remain as concerns or key uncertainties. While recent (five-year) returns are declining across all populations, the declines are from relatively high returns in the previous five-to-ten year interval, so the longer-term risk metrics that are meant to buffer against short-period changes in abundance and productivity remain unchanged.

Natural-origin spawning estimates are highly variable relative to minimum abundance thresholds across the populations in the DPS. Two of the four MPGs in this DPS include at least one population rated at “low” or “very low” risk for abundance and productivity, while the other two MPGs, including the Walla Walla/Umatilla MPG, remain in the “moderate” to “high” risk range (Table 2).

Updated information indicates that stray levels into the John Day River populations have decreased in recent years. Out-of-basin hatchery stray proportions, although reduced, remain high in spawning reaches within the Deschutes River basin and the Umatilla, Walla Walla, and Touchet River populations. Overall, the Middle Columbia River steelhead DPS remains at “moderate” risk of extinction, with viability unchanged from the prior review.

Limiting Factors

Limiting factors for this species include (NMFS 2009; NWFSC 2015):

1. Degradation of floodplain connectivity and function, channel structure and complexity, riparian areas, fish passage, stream substrate, stream flow, and water quality.

2. Mainstem Columbia River hydropower-related impacts.

3. Degraded estuarine and nearshore marine habitat.

4. Hatchery-related effects.

5. Harvest-related effects.

6. Effects of predation, competition, and disease.

A summary of Middle Columbia River Steelhead Distinct Population Segment viability, relative to Interior Columbia Technical Recovery Team (ICTRT) viability criteria, for populations in each Major Population Group are shown in Table 2 below. Natural spawning abundance is the most-recent 10-year geometric mean. ICTRT productivity is the most recent 20-year geometric mean for parent escapements below 75 percent of population threshold. Scores for the key elements of abundance and productivity (A/P), diversity, and spatial structure and diversity (SS/D), were used to determine current overall viability risk for Middle Columbia River steelhead during the most recent status review (NWFSC 2022). Risk ratings include very low (VL), low (L), moderate (M), high (H), and extirpated (E). Maintained (MT) population status indicates that the population does not meet the criteria for a viable population but does support ecological functions and preserves options for recovery of the Distinct Population Segment.

Table 2. Summary of Middle Columbia River Steelhead Distinct Population Segment viability relative to Interior Columbia Technical Recovery Team viability criteria, for populations in each Major Population Group.

	Abundance and Productivity Metrics				**Spatial Structure and Diversity Metrics**			
Population	**ICTRT Minimum Threshold**	**Natural Spawning Abundance**	**ICTRT Productivity**	**A/P Risk**	**Natural Processes Risk**	**Diversity Risk**	**SS/D Risk**	**Overall Viability Rating**
Eastern Cascades Major Population Group								
Fifteenmile Creek	500	378	2.12	M	L	M	M	MT
Klickitat River	1,000	1,462	1.07	M	L	M	M	MT
Deschutes Eastside	1,000	604	1.75	M	L	M	M	MT
Deschutes Westside	1,500 (1,000)	538	1.1	H	L	M	M	H
Rock Creek	500	298	-	H	M	M	M	H
White Salmon	500	-	-	-	-	-	-	E

	Abundance and Productivity Metrics				Spatial Structure and Diversity Metrics			
Population	**ICTRT Minimum Threshold**	**Natural Spawning Abundance**	**ICTRT Productivity**	**A/P Risk**	**Natural Processes Risk**	**Diversity Risk**	**SS/D Risk**	**Overall Viability Rating**
John Day River Major Population Group								
Crooked River	2,000	-	-	-	-	-	-	E
Upper John Day	1,000	738	1.56	M	VL	M	M	MT
North Fork John Day	1,000	1,852	3.31	VL	VL	L	L	Highly Viable
Middle Fork John Day	1,000	3,371	4.49	VL	L	M	M	Viable
South Fork John Day	500	943	2.45	VL	VL	M	M	Viable
Lower John Day Tributaries	2,250	1,424	2.72	M	VL	M	M	MT
Umatilla/Walla Walla Major Population Group								
Umatilla River	1,500	2,747	0.98	M	M	M	M	MT
Touchet River	1,000	253	0.91	H	L	M	M	H
Walla Walla River	1,000	713	1.79	M	M	M	M	MT
Yakima River Major Population Group								
Satus Creek	1,000 (500)	1,064	1.92	L	L	M	M	Viable
Toppenish Creek	500	407	3.35	M	L	M	M	MT
Naches River	1,500	1,340	2.00	M	L	M	M	MT
Upper Yakima	1,500	346	1.73	M	M	H	H	H

2.2.2. Status of Critical Habitat

In this section, we examine the status of designated critical habitat by examining the condition and trends of the essential PBFs of that habitat throughout the designated areas (Table 3). These features are essential to the conservation of the ESA-listed species because they support one or more of the species' life stages (e.g., sites with conditions that support spawning, rearing, migration, and foraging). Rangewide, all habitat types are impaired to some degree, even though many of the watersheds comprising the fully designated area are ranked as providing high conservation value. The proposed action, however, affects only freshwater rearing and freshwater migration habitats.

Table 3. Physical and biological features of critical habitat designated for Middle Columbia River steelhead, and corresponding species life history events.

Physical or Biological Features		Species Life History Event
Site Type	**Site Attribute**	
Freshwater Spawning	Substrate Water quality Water quantity	Adult spawning Embryo incubation Alevin growth and development
Freshwater Rearing	Floodplain connectivity Forage Natural Cover Water quality Water quantity	Fry/parr/smolt growth and development
Freshwater Migration	Free of artificial obstruction Natural cover Water quality Water quantity	Adult upstream migration and holding Kelt (steelhead) seaward migration Fry/parr/smolt growth, development, and seaward migration
Estuarine Areas	Forage Free of artificial obstruction Natural cover Salinity Water quality Water quantity	Adult sexual maturation and "reverse smoltification" Adult upstream migration and holding Kelt (steelhead) seaward migration Fry/parr/smolt growth, development, and seaward migration

For salmon and steelhead, NMFS' critical habitat analytical review teams (CHART) ranked watersheds within designated critical habitat at the scale of the fifth-field hydrologic unit code (HUC5) in terms of the conservation value they provide to each ESA-listed species that they support (NMFS 2005). The conservation rankings are high, medium, or low. To determine the conservation value of each watershed to species viability, CHART evaluated the quantity and quality of habitat features (e.g., spawning gravels, wood and water condition, and side channels), the relationship of the area compared to other areas within the species' range, and the significance of the population occupying that area to the species' viability criteria. Thus, even if a location had poor habitat quality, it could be ranked with a high conservation value, if it were essential due to factors such as limited availability (e.g., one of a very few spawning areas), a unique contribution of the population it served (e.g., a population at the extreme end of geographic distribution), or the fact that it serves another important role (e.g., obligate area for migration to upstream spawning areas).

Interior Columbia Recovery Domain

Critical habitat has been designated in the Interior Columbia recovery domain (ICRD), which includes the Umatilla and Walla Walla rivers. Habitat quality in tributary streams in the ICRD varies from excellent in wilderness and roadless areas to poor in areas subject to heavy agricultural and urban development (Wissmar et al. 1994; NMFS 2009). Intense agriculture, alteration of stream morphology (i.e., channel modifications and diking), riparian vegetation disturbance, wetland draining and conversion, livestock grazing, dredging, road construction and maintenance, logging, mining, and urbanization (EPA 2020; Lee et al. 1997; McIver and Starr 2001; NMFS 2009) have degraded critical habitat throughout much of the ICRD. Reduced summer stream flows, impaired water quality, and reduced habitat complexity are common

problems for critical habitat in developed areas, including Garrison Creek, a Mill Creek distributary.

Migratory habitat quality in this area has been affected by the development and operation of the Columbia River System dams and reservoirs in the mainstem Columbia River, Bureau of Reclamation tributary projects, and privately owned dams in the Snake and Upper Columbia River basins. For example, construction of Hells Canyon Dam eliminated access to several likely production areas in Oregon and Idaho, including the Burnt, Powder, Weiser, Payette, Malheur, Owyhee, and Boise river basins (Good et al. 2005), and Grand Coulee and Chief Joseph dams completely block anadromous fish passage on the upper mainstem Columbia River.

Hydroelectric development modified natural flow regimes, resulting in higher water temperatures, changes in fish community structure leading to increased rates of piscivorous and avian predation on juvenile salmon and steelhead, and delayed migration for both adult and juveniles. Physical features of dams, such as turbines, also kill migrating fish. In-river survival of emigrating juveniles is inversely related to the number of hydropower projects encountered. Similarly, development and operation of extensive irrigation systems and dams for water withdrawal and storage in tributaries have altered hydrological cycles.

A series of large regulating dams on the middle and upper Deschutes River affect flow and block access to upstream habitat, and have extirpated one or more populations from the Cascades Eastern Slope major population. Also, operation and maintenance of large water reclamation systems such as the Umatilla Basin and Yakima projects have significantly modified flow regimes and degraded water quality and physical habitat in this domain.

Many stream reaches designated as critical habitat in the ICRD are over-allocated, with more allocated water rights than existing streamflow. Withdrawal of water, particularly during low-flow periods that commonly overlap with agricultural withdrawals, often increases summer stream temperatures, blocks fish migration, strands fish, and alters sediment transport (Spence et al. 1996). NMFS has identified reduced tributary streamflow as a major limiting factor for MCR steelhead in this area (NMFS 2007; NMFS 2011).

Many stream reaches designated as critical habitat are listed on Oregon's and Washington's Section 303(d) lists for water temperature. Many areas that were historically suitable rearing and spawning habitat are now unsuitable due to high summer stream temperatures. Removal of riparian vegetation, alteration of natural stream morphology, and withdrawal of water for agricultural or municipal use all contribute to elevated stream temperatures. Contaminants such as insecticides and herbicides from agricultural runoff and heavy metals from mine waste are common in some areas of critical habitat.

The ICRD is a very large and diverse area. CHART determined that few watersheds with PBFs for Chinook salmon or steelhead are in good-to-excellent condition with no potential for improvement. Overall, most ICRD watersheds are in fair-to-poor or fair-to-good condition. However, most of these watersheds have some or high potential for improvement.

Despite these degraded habitat conditions, the hydrologic unit codes that have been identified as critical habitat for this species are largely ranked as having high conservation value. Conservation value reflects several factors, including: (1) how important the area is for various life history stages, (2) how necessary the area is to access other vital areas of habitat, and (3) the relative importance of the populations the area supports relative to the overall viability of the DPS.

A summary of the status of critical habitats considered in this opinion is provided in Table 4.

Table 4. Critical habitat, designation date, Federal Register citation, and status summary for critical habitat considered in this opinion.

Species	Designation Date and Federal Register Citation	Critical Habitat Status Summary
Middle Columbia River steelhead	9/02/05 70 FR 52630	Critical habitat encompasses 15 subbasins in Oregon and Washington containing 111 occupied watersheds, as well as the Columbia River rearing/migration corridor. Most fifth-field hydrologic code watersheds with physical or biological features for salmon are in fair-to-poor or fair-to-good condition (NMFS 2005). However, most of these watersheds have some or a high potential for improvement. The conservation value of occupied fifth-field hydrologic code watersheds is rated as high for 80 watersheds, medium for 24 watersheds, and low for 9 watersheds.

2.2.3. Climate Change

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

During the last century, average regional air temperatures in the Pacific Northwest increased by 1 to 1.4°F as an annual average, and up to 2°F in some seasons, based on average linear increase per decade (Abatzoglou et al. 2014; Kunkel et al. 2013). Warming is likely to continue during the next century as average temperatures are projected to increase another 3 to 10°F, with the largest increases predicted to occur in the summer (Mote et al. 2014; USGCRP 2018). The 5 warmest years in the 1880 to 2019 record have all occurred since 2015, while 9 of the 10 warmest years have occurred since 2005 (Lindsey and Dahlman 2020).

Decreases in summer precipitation of as much as 30 percent by the end of the century are consistently predicted across climate models (Mote et al. 2014). Precipitation is more likely to occur from October through March, less during summer months, and more winter precipitation will be rain than snow (ISAB 2007; Mote et al. 2014). Earlier snowmelt will cause lower stream flows in late spring, summer, and fall, and water temperatures will be warmer (ISAB 2007; Mote et al. 2014). Models consistently predict increases in the frequency of severe winter precipitation events (i.e., 20-year and 50-year events) in the western United States (Dominguez et al. 2012). The largest increases in winter flood frequency and magnitude are predicted in mixed rain-snow watersheds (Mote et al. 2014).

The combined effects of increasing air temperatures and decreasing spring through fall flows are expected to cause increasing stream temperatures. Overall, about one-third of the current cold-water salmonid habitat in the Pacific Northwest is likely to exceed key water temperature thresholds by the end of this century (Mantua et al. 2009). Higher temperatures will reduce the quality of available salmonid habitat for most freshwater life stages (ISAB 2007). Reduced flows will make it more difficult for migrating fish to pass physical and thermal obstructions, limiting their access to available habitat (Isaak et al. 2012; Mantua et al. 2010). Temperature increases shift timing of key life cycle events for salmonids and species forming the base of their aquatic foodwebs (Crozier et al. 2011; Tillmann and Siemann 2011; Winder and Schindler 2004). Higher stream temperatures will also cause decreases in dissolved oxygen and may also cause earlier onset of stratification and reduced mixing between layers in lakes and reservoirs, which can also result in reduced oxygen (Meyer et al. 1999; Raymondi et al. 2013; Winder and Schindler 2004). Higher temperatures are likely to cause several species to become more susceptible to parasites, disease, and higher predation rates (Crozier et al. 2008; Raymondi et al. 2013; Wainwright and Weitkamp 2013).

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

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

Moreover, as atmospheric carbon emissions increase, increasing levels of carbon are absorbed by the oceans, changing the pH of the water. A 38 to 109 percent increase in acidity is projected by the end of this century in all but the most stringent CO_2 mitigation scenarios, and is essentially irreversible over a time scale of centuries (IPCC 2014). Regional factors appear to be amplifying

acidification in Northwest ocean waters, which is occurring earlier and more acutely than in other regions and is already impacting important local marine species (Barton et al. 2012; Feely et al. 2012). Acidification also affects sensitive estuary habitats, where organic matter and nutrient inputs further reduce pH and produce conditions more corrosive than those in offshore waters (Feely et al. 2012; Sunda and Cai 2012).

Global sea levels are expected to continue rising throughout this century, reaching likely predicted increases of 10 to 32 inches by 2081–2100 (IPCC 2014). These changes will likely result in increased erosion and more frequent and severe coastal flooding and shifts in the composition of nearshore habitats (Tillmann and Siemann 2011). Estuarine-dependent salmonids such as chum and Chinook salmon are predicted to be impacted by significant reductions in rearing habitat in some Pacific Northwest coastal areas (Glick et al. 2007). Historically, warm periods in the coastal Pacific Ocean have coincided with relatively low abundances of salmon and steelhead, while cooler ocean periods have coincided with relatively high abundances, and therefore these species are predicted to fare poorly in warming ocean conditions (Scheuerell and Williams 2005; Zabel et al. 2006). This is supported by the recent observation that anomalously warm sea surface temperatures off the coast of Washington from 2013 to 2016 resulted in poor coho and Chinook salmon body condition for juveniles caught in those waters (NWFSC 2015). Changes to estuarine and coastal conditions, as well as the timing of seasonal shifts in these habitats, have the potential to impact a wide range of listed aquatic species (Reeder et al. 2013; Tillmann and Siemann 2011).

The adaptive ability of these threatened and endangered species is depressed due to reductions in population size, habitat quantity and diversity, and loss of behavioral and genetic variation. Without these natural sources of resilience, systematic changes in local and regional climatic conditions due to anthropogenic global climate change will likely reduce long-term viability and sustainability of populations in many of these evolutionarily significant units (ESU) and DPSs (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.

Potential climate change effects in the Walla Walla River Basin are likely to include more precipitation in the form of rain than snow, increased frequency of high flows in the late fall and winter, and an earlier onset of spring snowmelt (Stewart et al. 2005). These changes will affect adult upstream migration and juvenile spring out-migrating flows, and will lower late season flows (Elsner et al. 2010). With a reduction in snowpack, the infiltration into groundwater that occurs from snow melting will be reduced and the corresponding late season flows that are fed by the groundwater will decline. A further reduction in late season flows will increase the need for fish to access higher elevations of the Basin during the summer to find areas of cooler water. The higher elevation areas contain much greater habitat diversity providing areas of cool water upwelling in the summer and refugia during floods. Overall, climate change represents a significant threat to recovery of MCR steelhead populations, including the Walla Walla population (ISAB 2007; NMFS 2009).

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). For purposes of this consultation, the action area is approximately 3,000 feet of Garrison Creek, from the culvert immediately upstream from the east creek crossing to approximately 100 feet downstream of the west creek crossing. This includes the area below the OHWM where flows will be managed, the dewatered area where construction will occur, and the free-flowing river where turbidity is likely during construction and when the construction area is re-watered. The action area also includes the staging area and access routes. The action area encompasses approximately 9 acres.

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).

2.4.1. Middle Columbia River Steelhead in the Action Area

The proposed action will take place within the Umatilla/Walla Walla Basin MPG boundaries and will affect the Walla Walla River population. The Umatilla/Walla Walla MPG does not meet viability criteria because the abundance and productivity of the Umatilla and Walla Walla populations are considered at moderate risk, the Touchet River population abundance and productivity is at high risk, and all three populations have moderate risk for spatial structure and diversity. Overall, the Umatilla and Walla Walla River populations are considered maintained while the Touchet River population is considered to be at high risk. Recovery criteria for the Umatilla/Walla Walla MPG requires two populations to meet viability criteria and the third population to be maintained. The ICTRT also calls for at least one population to be highly viable. Under current conditions, the Umatilla River population is the closest to being highly viable. Of the remaining two populations, the Walla Walla is much closer to reaching viable status than the Touchet River population.

The Walla Walla River population occupies the Walla Walla River and its tributaries, including Garrison Creek, and excluding the Touchet River. A small number of juvenile Walla Walla River steelhead use Garrison Creek and the project area for rearing and migration. Steelhead do not use Garrison Creek for spawning.

The Walla Walla River population is considered intermediate sized, with an abundance threshold of 1,000 spawners (10–12 year geometric mean) and a productivity threshold of 1.35 recruits per spawner. Currently, the Walla Walla population does not meet its abundance threshold (Table 5).

For the 2015 review, the 10-year geomean (2005–2014) of total abundance decreased for the Walla Walla River population, and the most recent draft escapement data suggests the 10-year geomean (2010–2019) for the Walla Walla population is continuing to decline (NWFSC 2022). Based on current abundance and productivity and spatial structure and diversity, NMFS considers the Walla Walla steelhead population to be at moderate risk of extinction, less than 25 percent risk of extinction over the next 100 years.

Table 5. The most recent 10-year geometric mean of natural-origin steelhead spawners and the most recent 20-year geometric mean for parental escapements below 75 percent of population threshold for the Walla Walla River steelhead population.

10-Year Geometric Mean of Natural Origin Spawners		**20-Year Geometric Mean of Recruits Per Spawner**	
Abundance Threshold	**Abundance Spawn Years 2010–2019**	**Productivity Threshold**	**Productivity**
1,000	713	1.35	1.79

Within the Recovery Plan (NMFS 2009), NMFS identifies several limiting factors for the Walla Walla population, including: (1) blocked and impaired fish passage, (2) sedimentation, (3) lack of habitat diversity, (4) flow manipulation, (5) high water temperatures, and (6) degraded floodplain and channel structure. The actions to address these limiting factors include: (1) protect and restore floodplain and riparian function, as well as channel migration processes, structure, and complexity; modify channel geometry, (2) install instream habitat, (3) set levees back or remove them completely, and (4) add large wood.

2.4.2. Critical Habitat in the Action Area

The project is located on Garrison Creek, which is designated critical habitat for MCR steelhead. Garrison Creek is a distributary of Mill Creek, and originates approximately 7.1 miles northeast of the action area as it breaks off from Mill Creek. Garrison Creek joins with the Walla Walla River approximately one river mile southwest of the action area.

Flows in Garrison Creek are normally very low, and the action area provides limited rearing and migration habitat and no spawning habitat. Water is diverted from Mill Creek to Garrison Creek at the Yellowhawk Diversion Dam. In general, about 4-6 cubic feet per second (cfs) is diverted into Garrison Creek. The primary function of Garrison Creek is to handle a portion of flood waters during high water events.

A screened diversion was installed in 2008 to prevent juvenile out-migrants from entering Garrison Creek at its confluence with Mill Creek. Prior to installation of the screened diversion, juvenile salmonid out migrants passed into the creek and became stranded within the system resulting in high levels of mortality. Juvenile steelhead still enter Garrison Creek at the mouth utilizing it, including the action area, for rearing.

The City operates an activated sludge wastewater treatment plant (WWTP), upgraded in 2001, adjacent to Garrison Creek and the action area. The WWTP is located approximately one mile southwest of the city limits, on a 14.4-acre parcel of land, a portion of a 160-acre parcel owned by the City. The WWTP has an existing National Pollutant Discharge Elimination System

(NPDES) permit for discharging effluent to Garrison Creek from November through April. The WWTP discharges treated effluent into Garrison Creek approximately 5,000 feet upstream from the confluence with the Walla Walla River. Treated effluent discharge goes to crops via an irrigation storage basin with two irrigation pumps during the growing season, generally April-October. In years prior to construction of the Mill Creek Flood Control Project and water diversion into Garrison Creek, treated effluent could make up 100 percent of the flow in Garrison Creek in the fall.

The WWTP currently discharges approximately 0.88 million gallons per day on an average annual basis, a portion of which is applied to the land treatment site, while the remainder is discharged to Garrison Creek. The WWTP applies effluent at agronomic rates to a 110 acre land treatment site during the growing season. During regular maintenance and harvest, treated water discharges to Garrison Creek or to a storage lagoon depending upon quality. Limitations of the irrigation system and land treatment site result in some discharges to Garrison Creek during the months of April through October. The existing NPDES permit for this facility includes a compliance schedule focusing on eliminating discharge to Garrison Creek from April through October.

A number of deficiencies at the WWTP have been identified which could make it increasingly difficult to reliably meet the NPDES permit requirements. Multiple numeric effluent violations occur annually, primarily in April through October. Most violations are for total coliforms. Other numeric violations for the current permit include low and high pH, high water temperature, low dissolved oxygen, and high ammonia. All of these negatively impact steelhead and can result in, but are not be limited to, reduced growth, stress responses, disease problems, and, in worst case scenarios, death. Annual violations also occur for monitoring (analysis not conducted and frequency of sampling) and reporting violations for failure to submit required reports. Proposed upgrades will address most of the identified deficiencies.

The area adjacent to the action area is dominated by agricultural land use. Garrison Creek runs between the WWTP land and agricultural land. Significant nearby nonpoint sources of pollutants include upstream housing and agricultural areas.

Two riverine wetlands (0.27 acres) occur along Garrison Creek in the action area. These wetlands primarily receive water from the stream via flooding or groundwater. These wetland areas consist primarily of yellow iris (*Iris pseudacorus*) jewelweed (*Impatiens capensis*), and Fuller's teasel (*Dipsacus fullonum*).

The substrate in Garrison Creek around the work areas consists primarily of silt and sand with a small amount of cobble (2 percent). At the west and east work areas channel sinuosity is low, and there are no pools, undercut banks, large woody debris, or boulders. Riparian vegetation in the work areas consists primarily of Himalayan blackberry (*Rubus armeniacus*), Fuller's teasel, poison hemlock (*Conium maculatum*), reed canary grass (*Phalaris arundinacea*), box elder (*Acer negundo*), balsam poplar (*Populus balsamifera*), and gray alder (*Alnus incana*). Woody debris occurs on the eastern and western ends of the creek within the action area, adjacent to more robust riparian vegetation (willows and poplars). West of the west creek crossing vegetation

becomes denser, woody debris begins to appear, the creek begins to widen, and some refugia is available.

Based on data from a gaging station operated by the Walla Walla Basin Watershed Council approximately 0.5 miles below the action area, Garrison Creek historically goes dry in late summer (mid-August to early September). On occasion, some flow does appear intermittently in the historic records during these months, but the average flow is less than 1 cubic foot per second in most years. However, according to WDFW Biologist Dave Karl (email on October 18, 2021), there are springs along Garrison Creek between the diversion structure on Mill Creek and the action area that contribute to Garrison Creek flow, and flow is likely present in the action area year-round.

Climate change is expected to result in increased air temperature and decreased spring-through fall flows in Garrison Creek. The combined effects of increasing air temperatures and decreasing spring-through-fall flows are expected to cause increasing stream temperatures. These will further reduce the quality of available rearing and migration habitat in Garrison Creek. Reduced flows will also make it more difficult for juvenile steelhead to access Garrison Creek for rearing. Lower flows may also result in increased numeric effluent violations for total coliforms, temperature, dissolved oxygen, ammonia, and pH.

Garrison Creek is considered impaired and on the Washington Department of Ecology 303(d) list for bacteria, temperature, dissolved oxygen, chlorinated pesticides and polychlorinated biphenyls (PCB), and is considered polluted for chlorine. Fecal coliform bacteria enter Garrison Creek through direct discharge of effluent from the WWTP. It can also enter from agricultural and storm runoff. Chlorinated pesticides and PCBs were banned in the 1970s and 1980s due to environmental concerns. However, chlorinated pesticides bind strongly to soil particles and continue to enter Garrison Creek as a result of excessive erosion of agricultural soils. PCBs enter from a combination of sources that include WWTP effluent and soil erosion. The Environmental Protection Agency approved Total Maximum Daily Loads (TMDL) are in place in Garrison Creek. Limits established in the TMDLs are reflected in the WWTP's current NPDES permit.

TMDL implementation subjects the City to wasteload allocations for:

1. Chlorinated Pesticides and PCBs (January-June)
2. Fecal Coliform (June-October)
3. Temperature (July-August)
4. pH and Dissolved Oxygen (May-October)

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 (see 50 CFR 402.02). 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).

Effects to MCR steelhead and critical habitat include: (1) injury and mortality from work area isolation and fish salvage; (2) water quality impacts from temporary increases in turbidity and releases of small amounts of chemicals during project construction; (3) increased exposure to predators from temporary increases in turbidity; (4) temporary loss of forage; (5) temporarily blocked fish passage; and (6) water quality impacts from continued operation of the facility.

2.5.1. Effects on Species

Presence and Exposure

Adult steelhead do not use Garrison Creek for migration or spawning. Therefore, project construction will not affect adult steelhead. Some limited juvenile MCR steelhead rearing and use of the action area occurs each year from fish migrating upstream from the mouth. Project construction will occur during the in-water work window, July 15-September 30, in 2022 or 2023, when a small number of juvenile steelhead may be present in the project area.

Work Area Isolation and Fish Salvage

Project construction will occur when little to no flow is present in Garrison Creek. If there is flow or water present in Garrison Creek, project construction will include installation of cofferdams, installation of pumps and fish salvage at the west creek crossing and east creek crossing work areas. Fish salvage will consist of herding fish out of the work areas with seines, and netting any fish that do not leave on their own volition. Netted fish will be transported in buckets and released in locations based on current water levels and habitat condition. Releases will occur upstream or downstream of work areas. Only one work area will be isolated at a time and each location will be isolated for approximately 5 days.

Many factors influence the success of fish salvage efforts including water depth, habitat complexity, temperature, salvage methods, crew experience, and care of fish after capture. At best, all fish are captured without injury and successfully released. However, in many cases some fish are difficult to capture, sustain injuries, and experience high stress after capture. Herding will minimize the risk of injury and mortality to listed fish to the extent possible. However, seining, netting, capture, and handling may injure fish and can increase stress, resulting in harm or death to some individuals. Additionally, a small number of fish may not be found by the fish capture crew and could end up stranded during dewatering.

NMFS estimates up to 4,500 square feet of Garrison Creek will be isolated and dewatered. NMFS used available data from WDFW electrofishing sampling in the Walla Walla Basin from 1998-2006 to estimate the density of juvenile steelhead in the action area during dewatering and fish salvage operations (Mendel et. al 2007). Garrison Creek was sampled in the summer of 2001 and 2003, with an average juvenile *O. mykiss* density of .01 per square meter (Mendel et al. 2007). The Walla Walla River in the vicinity of Garrison Creek was sampled in 7 years, with an

average density of 0.027 juvenile steelhead per square meter. Applying the highest juvenile density of 0.027 fish per square meter (0.0025 per square foot), NMFS estimates 12 fish could be occupying the in-water work area prior to commencement of salvage operations. Eight juvenile steelhead at the west work area (3,000 square feet) and four (1,500 square feet) at the east work area.

Because Garrison Creek in the action area contains little cover, the streambed is primarily silt and sand, and flows will be very low, NMFS estimates that 95 percent of juveniles in each in-water work area (7 at the west work area and 3 at the east work area) will be captured and released without ill effects.[1] However, we expect that the remaining 5 percent (1 at the west work area and 1 at the east work area) will be injured or killed because they are unable to be captured during fish salvage and succumb to lack of oxygen or desiccation during dewatering, or they will experience external or internal injury, including injurious levels of stress, during holding and handling. We assume that fish that are injured or experience injurious levels of stress will be less likely to survive the challenges of outmigration and will ultimately die as a result. Therefore, NMFS estimates 10 juvenile steelhead will be salvaged and released safely, and two juveniles will be injured or killed, during fish salvage in Garrison Creek (Table 6).

Table 6. Area of fish salvage and estimated number of juvenile Middle Columbia River summer steelhead salvaged, for the City of College Place Wastewater Treatment Upgrade Project, July 15-September 30, 2022 or 2023.

		Number of Juvenile MCR Steelhead		
Fish Salvage Location	**Area (square feet)**	**In Fish Salvage Location**	**Successfully Salvaged**	**Injured or Killed**
West Creek Crossing	3,000	8	7	1
East Creek Crossing	1,500	4	3	1
Total	4,500	12	10	2

Using a fry to smolt survival rate of 0.135 (Quinn 2005) and a smolt to adult survival rate of 0.035 (Mendel et al. 2014; StreamNet Coordinated Assessment Data Portal), the injury or death of up to 2 juvenile steelhead does not accrue to the loss of one adult steelhead. NMFS does not believe the proposed action will influence the abundance or productivity of the Walla Walla River population.

Physical Injury

Work involving the presence of equipment or vehicles in the active channel when ESA-listed fish are present can result in injury or death of some individuals as they come in contact with the equipment. Prior to conducting in-channel work, a qualified fish biologist will salvage all areas with rearing MCR steelhead, and then work areas will be dewatered. Therefore, we do not anticipate physical injury to MCR steelhead from operation of equipment in the active channel.

1 This is a conservative estimate based on the professional opinion of NMFS biologists and takes into account expected fish size, capture methods, and site conditions. The latter include anticipated depth, cover, substrate, turbidity, and flow.

Water Quality

The proposed action will affect water quality during work area isolation and dewatering, equipment entry and exit from the work area, fish salvage, and when flows are reestablished, by temporarily increasing sediment delivery to the waterway and turbidity in the water column, and by small releases of fuels and contaminants. Increased fine sediment can be detrimental to juvenile salmon and steelhead in several ways including avoidance of the area, abandonment of cover, stress, and reduced growth rates (Newcombe and Jensen 1996). Turbidity from increased fine sediment may disrupt steelhead feeding and territorial behavior and may displace fish from preferred feeding and resting areas. Direct mortality can occur at very high concentrations or extended exposure to suspended solids. The severity of effect of suspended sediment increases as a function of the sediment concentration and exposure time (Bash et al. 2001; Newcombe and Jensen 1996).

We expect turbidity to increase downstream for a short period of time (minutes to an hour) during installation and removal of isolation materials, during fish salvage, and immediately after flow is reestablished. NMFS also expects increased turbidity from pumping water around both work areas. Based on low flows, BMPs including erosion and sediment controls, and because construction activities will not occur during extreme wet conditions, we do not expect turbidity to extend more than 100 feet downstream of either the west or east work areas. We expect turbidity to extend 100 feet downstream of the west work area, and span across the approximately 15-foot wide channel (1,500 square feet). We also expect turbidity to extend 100 feet downstream of the east work area, and span across the approximately 10-foot wide channel (1,000 square feet). Additionally, we expect most turbidity plumes to be of low concentration based on BMPs. However, we expect some short-term, higher turbidity concentration plumes that will last minutes to an hour for up to 5 days at each work area, because the substrate in Garrison Creek around the work areas consists primarily of silt and sand and this fine material tends to stay in suspension longer than coarser sediments. Therefore, NMFS expects that the turbidity levels generated by this action will cause temporary behavioral changes to steelhead below the west and east work areas, including changes in feeding behavior and movement of fish within turbidity plumes, which will increase the risk of predation (Berg And Northcote 1985).

We used the same fish density estimate applied above to estimate the number of juveniles that will be exposed to increased suspended sediment concentrations below each work area. Therefore, we estimate exposure to four juvenile *O. mykiss* below the west work area (1,500 square feet x .0025 juveniles per square foot) and to three below the east work area (1,000 square feet x 0.0025 juveniles per square foot). We also expect suspended sediment concentrations to last for several minutes to an hour for 5 days at the west work area and for 5 days at the east work area. When exposed to increased suspended sediment concentrations, some individuals will likely move to avoid the turbid water, and others may sustain some physical or physiological damage, but it is unlikely that any will die. However, as a worst-case scenario, we assume that all of these fish will be steelhead and all will be harmed. Using the same fry to smolt and smolt to adult survival rates as above, these seven juveniles would not be one adult equivalent.

Additional impairment of water quality may result from accidental releases of fuel, oil, and other contaminants that can injure or kill aquatic organisms. Petroleum-based contaminants, such as

fuel, oil, and some hydraulic fluids, contain polycyclic aromatic hydrocarbons (PAHs), which can kill salmon at high levels of exposure, and can cause sublethal, adverse effects at lower concentrations (Meador et al. 2006). Therefore, spills that make their way into Garrison Creek could harm fish. The operation of equipment will predominantly be in isolated and dewatered areas. Since most fish will be removed from the in-channel work area before construction, very few are likely to be exposed to accidental spills. In addition, NMFS anticipates that only very small quantities (ounces) of PAHs are likely with each accidental release or spill. Conservation measures will be implemented to prevent or contain any spill that may occur (e.g., staging and fueling equipment in a protected location, emergency spill response kit available onsite, and equipment maintenance). These should minimize the opportunity for contaminants to enter the waterway and affect steelhead. NMFS does not expect any fish to be injured or killed by exposure to accidental releases of fuel, oil, and other contaminants caused by this action.

Forage

Food availability has the potential to limit stream salmonid production (McCarthy et al. 2009; Wipfli and Baxter 2010). In lotic environments, salmonids primarily forage on aquatic and terrestrial invertebrates drifting in the water column (Allan et al. 2003; Cada et al. 1987; Weber et al. 2014; Wipfli 1997). Salmonids may also forage epibenthically, especially during periods of low flow or low drift abundance (Angradi and Griffith 1990; Tippets and Moyle 1978).

The proposed action will effect benthic invertebrates by crushing, covering, or dislodging them during work area isolation and pipeline installation, desiccation during dewatering, settling of sediment below isolated work areas, and removal of 0.1 acres of non-native riparian vegetation consisting primarily of reed canary grass and blackberry. Pipeline installation and dewatering will disturb approximately 4,500 square feet (0.10 acres). At the west work area, pipelines will be installed in a 7-feet 3-inches wide open-cut trench after the 3,000 square foot work area is dewatered. At the east work area, the pipeline will be installed in a 2-feet 10-inch wide open-cut trench after the 1,500 square foot work area is dewatered.

Drying events typically result in major changes to instream communities and reductions in local benthic invertebrate production (Chadwick and Huryn 2005; Leigh et al. 2016; Storey 2016). The response of macroinvertebrate assemblages to drying is influenced by drying duration and stream characteristics (Vadher et al. 2018). Each dewatering event in Garrison Creek will last 5 days. Therefore, we expect each dewatering event to result in a small reduction of taxa richness and density (Fritz and Dodds 2004).

An additional 2,500 square feet of river bottom; up to 100 feet downstream of the west work area and across the 15-foot channel (1,500 square feet) and 100 feet downstream of the east work area and across the 10-foot channel (1,000 square feet), may be disturbed by turbidity and settling of suspended sediment. Fine sediment accumulation can cause a loss of abundance and diversity in macroinvertebrate communities (Ehrhart et al., 2002; Larsen and Ormerod 2010; Wood and Armitag 1997). Many macroinvertebrate taxa belonging to the Ephemeroptera, Plecoptera and Trichoptera orders, which provide the most productive and available food for stream fishes, are particularly affected by sedimentation (Waters 1995; Wood et al. 2005). We expect a fine film of sediment to settle out of suspension within 100 feet downstream of each in-channel work area.

Additionally, we expect most turbidity plumes to be of low concentration based on BMPs. However, we expect some short-term, higher turbidity concentration plumes because the substrate in Garrison Creek around the work areas consists primarily of silt and sand. We also expect the deposited sediment to flush out with the first high flow event.

The alteration of 7,000 square feet (0.16 acres) of riverbed will cause localized reductions in macroinvertebrates that serve as the principle food source for juvenile steelhead. Following reconnection of the isolated areas with the flowing channel, drifting invertebrates from upstream will provide a prey base. We also expect forage species will begin to recolonize disturbed areas via drift and migration within a few days, and will fully recolonize the area within a few months to 1 year after project completion (Fowler 2004; Fritz and Dodds 2004; Griffith and Andrews 1981; Yount and Nemi 1990). The City will also replace impacted non-native riparian vegetation with native bushes and tree species, that will contribute terrestrial invertebrates and improve available forage over time.

Therefore, in a worst-case scenario, benthic habitat disturbance will slightly decrease forage production and availability to migrating and rearing steelhead for about 1 year. Less forage will temporarily increase competition for food among salmonid juveniles, requiring expenditure of extra energy, and thus slower growth (Bacon et al. 2005; Cada et al. 1987; Weber et al. 2014). Slower growing individuals will be more susceptible to predation and have decreased chances for overwinter survival (Evans et al. 2014; Hostetter et al. 2012; Mesa et al. 1994). Numerous studies report a positive correlation between juvenile salmonid length and survival (Evans et al. 2014; Zabel and Achord 2004). Length-related survival advantages may be associated with longer steelhead being less susceptible to predation (Hostetter et al. 2012; Mesa et al. 1994) and/or having other competitive advantages related to increased swimming performance and energy reserves (Zabel and Achord 2004). Competition for space among stream salmonids often results in a reduction in foraging area or need to occupy suboptimal foraging positions (Toobaie and Grant 2013; Wood et al. 2012). For lotic salmonids, competitive ability and territory size have been shown to increase with body size (Keeley 2001). We do not have sufficient data to determine how many juveniles may be harmed by a decrease in forage production. Some fish will likely find alternative foraging areas while still being able to avoid predation.

Blocked Passage

Installation of cofferdams and dewatering to exclude fish from work areas will prevent upstream and downstream migration of juvenile steelhead for 10 days; 5 days at the west work area in 200 linear feet and 5 days at the east work area in 150 linear feet. Only one work area will be isolated and block migration at a time. Because of expected low flows during the in-water work window (1 cfs or less), NMFS expects very few juvenile steelhead will be migratory within Garrison Creek at this time. Therefore, NMFS expects a very small number of MCR steelhead will be blocked from migrating upstream and downstream for 5 days in 200 feet of Garrison Creek at the west work area and for 5 days in 150 feet of Garrison Creek at the east work area.

Water Quality Effects from Operation of the Facility into the Future.

The WWTP will continue to operate and discharge treated effluent into the future, with a new NPDES permit issued by Washington Department of Ecology in 2022 or 2023. The current permit reflects increasingly stringent discharge limits stemming from Walla Walla Basin TMDLs. Therefore, we expect new permit effluent limits to remain the same or be slightly more stringent.

Numeric effluent violations have primarily occurred May through October. The majority of these violations are exceedances of total coliforms. Additional violations in May through October of the current permit include low dissolved oxygen, high water temperature, and low and high pH. Removal of outfall into Garrison Creek for the critical season of May through October is a requirement for the implementation of the pH and dissolved oxygen TMDL. Treated effluent releases to Garrison Creek will continue from November through April. Violations for total coliforms have also occurred from effluent releases in this timeframe. From completion of the TMDL Implementation Plan in 2002 to effectiveness monitoring in 2015, fecal coliform concentrations in Garrison Creek reduced in all seasons, and met the low-flow season reduction target but not the high-flow season reduction target. Therefore, further reductions of fecal coliform are needed to meet NPDES permit limits (Dugger 2021).

The City owns approximately 148 acres surrounding the wastewater treatment facility of which 110.4 acres are available for use as a land treatment system. The NPDES permit authorizes discharge to the land treatment system from May through October. The City is authorized to apply wastewater to the designated treatment site via spray irrigation at agronomic rates for nitrogen and water, and at rates for other wastewater constituents that are protective of the background groundwater quality. Total net nitrogen and water applied to the irrigation lands cannot exceed the crop requirements as determined by the City's Irrigation and Crop Management Plan. The project will expand the land application area by 60 acres. The expanded land application area is located approximately 0.25 miles from Garrison Creek and is already bare/agricultural ground. Expansion of the land application area, which includes increased effluent storage, will decrease effluent discharge to Garrison Creek.

Facility upgrades will be completed by December 31, 2023. These upgrades will improve effectiveness of effluent treatment, increase area of land application, eliminate effluent releases to Garrison Creek in May through October, and decrease or eliminate effluent violations in November through April. Therefore, NMFS expects facility upgrades to decrease pollutant discharge, decrease fecal coliform concentrations, and improve water quality in Garrison Creek. Water quality improvements will benefit rearing summer steelhead.

Summary of Effects on Species

NMFS estimates two juvenile MCR steelhead will be injured or killed during fish salvage activities. The injury or death of two juvenile steelhead does not accrue to the loss of one adult steelhead. Turbidity levels generated by this action will cause temporary behavioral changes to seven juvenile steelhead, less than one adult equivalent, including changes in feeding behavior and movement of fish within turbidity plumes, which will increase the risk of predation. NMFS

also expects effects to growth of juvenile steelhead from loss of forage in 7,000 square feet for up to 1 year. Slower growing individuals will be more susceptible to predation and have decreased chances for overwinter survival. A very small number of MCR steelhead will also be blocked from migrating upstream and downstream for 5 days in 200 feet of Garrison Creek at the west work area and for 5 days in 150 feet of Garrison Creek at the east work area. Water quality will improve in Garrison Creek following completion of the project benefitting summer steelhead.

2.5.2. Effects on Critical Habitat

Critical habitat for MCR steelhead is designated for the Walla Walla River. The action area includes PBFs for freshwater migration and rearing. The essential features in the action area that are shared by these two types of PBFs and will be affected by the proposed action include (1) degraded water quality and substrate from project construction, (2) loss of forage, (3) short term loss of natural cover, (4) short term obstruction of fish passage, and (5) long term improvement of water quality. The effects of the proposed action on these features are summarized below.

Water Quality

Water quality will be reduced within the project area for approximately 10 days. The action is expected to temporarily increase delivery of sediment to the waterway and suspend fine sediment during work area isolation and dewatering, equipment entry and exit from the west and east work areas, fish salvage, and when flows are reestablished, increasing turbidity in the water column.

Because the work areas will be isolated from the flowing channel, turbidity and erosion control measures will be implemented during construction, and pumped water will be released outside the channel, very little sediment is expected to be released from the project site. Resuspension of sediment will be localized and is expected to last for a few hours each day during isolation material installation and removal and fish salvage, but is not expected to extend more than 100 feet downstream of each work area, settling quickly in the expected low flows. We expect turbidity from pumped water to be of low concentration and not extend more than 100 feet downstream of each work area. NMFS also expects minor leaks and spills of petroleum-based fluids (not more than ounces) that will be contained within isolated work areas and diluted once isolated areas are reconnected with flowing water. Therefore, NMFS expects small, temporary negative effects to water quality at the scale of the action area.

Substrate

Substrate conditions within the affected stream reach are expected to experience minor levels of sediment deposition as the small turbidity plumes settle out within 100 feet downstream of each work area. Accumulated sediment is expected to flush out with the first high flows. Therefore, NMFS expects small, temporary negative effects to substrate at the scale of the action area.

Forage

The proposed action will negatively affect the availability of benthic invertebrates by covering, dewatering, or displacing them from up to 7,000 square feet (0.16 acres) of streambed. Following reconnection of the isolated areas with the flowing channel, drifting invertebrates from upstream will provide a prey base and recolonize the sediment. Over time, forage will improve and return to pre-project levels. We expect recolonization to occur within a few days to 1 year after project completion (Fowler 2004; Griffith and Andrews 1981; Yount and Nemi 1990). Given the small area of benthic habitat disturbance and the short-term nature of the action, NMFS expects this project to have a small, negative effect on forage at the scale of the action area. Less forage will negatively impact growth, and slower growing individuals will be more susceptible to predation and have decreased chances for overwinter survival.

Natural Cover

Riparian vegetation provides overhead cover, shade, woody material that provides complex cover instream, and terrestrial invertebrates and allochthonous inputs. Approximately 0.10 acres of riparian habitat consisting of reed canary grass and Himalayan blackberry, with a small amount of Fuller's teasel and poison hemlock will be impacted during project construction. No trees will be removed. Therefore, NMFS expects small, temporary negative effects to riparian vegetation and natural cover at the scale of the action area.

Impacted riparian habitat will be replaced at a 1:1 ratio using native trees and shrubs, and survival will be monitored. As vegetation becomes established, NMFS expects improvements to riparian habitat and natural cover at the scale of the action area, with native species replacing invasive species.

Passage Free of Artificial Obstruction

As described in the environmental baseline (Section 2.4.) and effects to species (Section 2.5.1.), installation of cofferdams to keep fish out of work areas will temporarily prevent upstream and downstream juvenile migration in Garrison Creek. Adults will not be in the project area during project construction.

Cofferdams will block passage in Garrison Creek for 10 days, 5 days at the west work area and 5 days at the east work area. Juvenile steelhead passage will be blocked in 200 linear feet of stream at the west work area, and then in 150 linear feet at the east work area. Obstructed passage will occur during the low flow (1 cfs or less), in-water work window, when very few juvenile steelhead would be migratory within Garrison Creek. Therefore, NMFS expect a very small number of MCR steelhead will be blocked from migrating upstream and downstream for 5 days in 200 feet of Garrison Creek at the west work area and for 5 days in 150 feet of Garrison Creek at the east work area. Therefore, the proposed action will affect the obstruction PBF at the scale of the action area.

Water Quality Effects from Operation of the Facility into the Future

As described above in Section 2.5.1., facility upgrades will be completed by December 31, 2023. These upgrades will improve effectiveness of effluent treatment, increase area of land application, eliminate effluent releases to Garrison Creek in May through October, and decrease or eliminate effluent violations in November through April. Therefore, NMFS expects facility upgrades to decrease pollutant discharge, decrease fecal coliform concentrations, and improve water quality in Garrison Creek. Therefore, NMFS expects facility upgrades to improve the water quality PBF at the scale of the action area.

Summary of Effects on Critical Habitat

The proposed action will have small, temporary effects to water quality (turbidity, sediment, chemical contamination) at the scale of the action area during project construction. Increases in total suspended solids and turbidity during project construction are expected to be small, extend up to 100 feet downstream, and persist for up to 10 days. Minor leaks and spills of petroleum-based fluids (not more than ounces) will be contained in isolated work areas and diluted when isolation barriers are removed. Small, negative effects to the substrate PBF in the action area will occur during project construction from sediment deposition up to 100 feet below each work area. Deposited sediment will be flushed out during the first high flow. Small, negative effects to the forage PBF will occur from loss of aquatic invertebrates, from project construction and dewatering 4,500 square feet of habitat, and from sediment deposition in an additional 2,500 square feet of benthic habitat. Forage will return to pre-project levels within 1 year after project completion. Decreased forage will negatively impact juvenile steelhead growth for 1 year, and slower growing individuals will be more susceptible to predation and have decreased chances for overwinter survival. A very small number of MCR steelhead will be blocked from migrating upstream and downstream for 5 days in 200 feet of Garrison Creek at the west work area and for 5 days in 150 feet of Garrison Creek at the east work area. Facility upgrades will improve the water quality PBF at the scale of the action area.

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 versus cumulative effects. Therefore, all relevant future climate-related environmental conditions in the action area are described in the environmental baseline (Section 2.4).

NMFS is not aware of any specific future non-federal actions that are reasonably certain to occur in the action area that are likely to contribute to cumulative effects on MCR steelhead or

designated critical habitat. The area adjacent to the action area is dominated by agricultural land use and WWTP infrastructure. NMFS expects that the area around the WWTP will maintain its agricultural land use and rural character for the next few decades. Also, we are not aware of any other planned construction associated with the WWTP. Population growth in College Place has been steady at a rate of 1 percent annually since 1990, and the WWTP was last upgraded in 2001. Therefore, NMFS does not expect any future State or private activities to contribute to cumulative effects on MCR steelhead or designated critical habitat.

2.7. Integration and Synthesis

The Integration and Synthesis section is the final step in our assessment of the risk that the proposed action poses to species and critical habitat. 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.

2.7.1. Middle Columbia River Steelhead

Middle Columbia River steelhead from the Walla Walla population inhabit the action area and depend on it to support critical life functions. The MCR steelhead DPS is not currently meeting the viability criteria described in the Mid-Columbia Steelhead Recovery Plan (NMFS 2009). The Walla Walla population of MCR steelhead will be affected by the proposed action. Recovery criteria for the Umatilla/Walla Walla MPG requires two populations to meet viability criteria and the third population to be maintained. The ICTRT also calls for at least one population to be highly viable. Overall, the Umatilla and Walla Walla River populations are considered maintained while the Touchet River population is considered to be at high risk. Under current conditions, the Umatilla River population is the closest to being highly viable. Of the remaining two populations, the Walla Walla is much closer to reaching viable status than the Touchet River population.

MCR steelhead juveniles use the action area for rearing and migration. Adult MCR steelhead do not migrate or spawn within the action area. As described in Section 2.5.1., the proposed action will have effects on juvenile MCR steelhead. We estimate that the proposed action will injure or kill two juvenile MCR steelhead, less than one adult equivalent, during fish salvage and dewatering. Based on the location of fish salvage, the affected steelhead are members of the Walla Walla River population of MCR steelhead. Additional juvenile steelhead will be affected by impacts to water quality. Fish will be salvaged before dewatering and project construction begins. However, temporary increases in turbidity during installation and removal of isolation barriers, fish salvage, equipment use in and near the stream, and pumping; along with turbidity plumes, which extend 100 feet downstream of isolated areas, are likely to alter the feeding behavior and movement of an estimated seven juvenile steelhead, less than one adult equivalent, which will increase the risk of predation. NMFS also expects effects to growth of juvenile steelhead from loss of forage in 7,000 square feet for up to 1 year. Slower growing individuals will be more susceptible to predation and have decreased chances for overwinter survival.

Upstream and downstream migration of a very small number of MCR steelhead will also be blocked for 5 days in 200 feet of Garrison Creek at the west work area and for 5 days in 150 feet of Garrison Creek at the east work area. After project completion, water quality will increase in the action area.

These effects and reductions are not expected to appreciably alter the abundance, productivity, spatial structure, or diversity of the Walla Walla River population or the Umatilla/Walla Walla MPG. It is NMFS' opinion that when the effects of the action and cumulative effects are added to the environmental baseline, and in light of the status of the species, the effects of the action will not cause reductions in reproduction, numbers, or distribution that would reasonably be expected, directly or indirectly, to reduce appreciably the likelihood of both the survival and recovery of MCR steelhead.

2.7.2. Critical Habitat

Critical habitat in the action area is degraded due to the construction, maintenance, and operation of the WWTP, agriculture, and low flows. As noted in Section 2.2.3., climate change is likely to further impact designated critical habitat. Increases in water temperature and changes to the hydrological regime will reduce suitable salmonid habitat and cause earlier migration of smolts. Warmer temperatures will likely lead to increased predation on juvenile salmonids in mainstem reservoirs (ISAB 2007). This is particularly true of non-native species such as bass and channel catfish where climate change will likely further accelerate their expansion (ISAB 2007). In addition, the warmer water temperatures will increase consumption rates by predators due to increased metabolic rates, which influence food demand.

The potential effects of the proposed action on MCR steelhead critical habitat are described in Section 2.5.2. NMFS expects adverse effects to water quality, sediment, and forage PBFs for ESA-listed MCR steelhead from installation and removal of isolation materials, operation of machinery within and adjacent to the Garrison Creek, fish salvage, and pumping of turbid water around each work area. The proposed action will have small, temporary effects to water quality (turbidity, sediment, chemical contamination) at the scale of the action area. Increases in total suspended solids and turbidity during project construction are expected to be small, extend up to 100 feet downstream, and persist for up to 10 days, 5 days at each work area. Minor leaks and spills of petroleum-based fluids (not more than ounces) will be contained in isolated work areas and diluted when isolation barriers are removed. Small, negative effects to the substrate PBF in the action area will occur during project construction from sediment deposition up to 100 feet below both the west and east work areas. Deposited sediment will be flushed out during the first high flow. Small, negative effects to the forage PBF will occur within a 7,000 square foot area, with forage returning to pre-project levels within 1 year after project completion. Decreased forage will negatively impact growth for 1 year, and slower growing individuals will be more susceptible to predation and have decreased chances for overwinter survival. Work area isolation barriers will obstruct upstream and downstream migration of juvenile steelhead for 5 days in 200 feet of Garrison Creek at the west work area and for 5 days in 150 feet of Garrison Creek at the east work area. Facility upgrades will improve the water quality PBF at the scale of the action area.

Based on our analysis, adverse effects from the proposed action will cause a small and localized decline in the quality and function of PBFs in the action area. However, because of the scale and extent of the effects to PBFs, we do not expect a reduction in the conservation value of critical habitat in the action area. Therefore, as we scale up from the action area to the designation scale, the proposed action is not expected to appreciably reduce the conservation value of critical habitat for MCR steelhead at the designation scale.

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 the cumulative effects, it is NMFS' biological opinion that the proposed action is not likely to jeopardize the continued existence of MCR steelhead or destroy or adversely modify its designated critical habitat.

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). "Harass" is further defined by interim guidance as to "create the likelihood of injury to wildlife by annoying it to such an extent as to significantly disrupt normal behavioral patterns which include, but are not limited to, breeding, feeding, or sheltering." "Incidental take" is defined by regulation as takings that result from, but are not the purpose of, carrying out an otherwise lawful activity conducted by the Federal agency or applicant (50 CFR 402.02). Section 7(b)(4) and section 7(o)(2) provide that taking that is incidental to an otherwise lawful agency action is not considered to be prohibited taking under the ESA if that action is performed in compliance with the terms and conditions of this ITS.

2.9.1. Amount or Extent of Take

In this opinion, NMFS determined that incidental take is reasonably certain to occur and will include harm and harassment caused by injury and mortality of two juveniles, less than one adult equivalent, during fish salvage and dewatering; altered feeding behavior and movement of an estimated seven juveniles, less than one adult equivalent, which will increase risk of predation; effects to growth of juvenile steelhead from loss of forage in 7,000 square feet for up to 1 year, which will result in increased predation and decreased survival; and from obstructed upstream and downstream migration for 5 days in 200 feet of Garrison Creek at the west work area and for 5 days in 150 feet of Garrison Creek at the east work area.

Work area isolation will be accomplished by: (1) installing cofferdams comprised of water-filled bladders or super sacks of clean, washed gravels, at the west work area (3,000 square feet) and the east work area (1,500 square feet), with only one work area isolated at a time; (2) pumping water around each work area, with water released over land at a slow rate and far enough from

the existing channel to avoid surface erosion and to return to the channel before percolation; and (3) dewatering 3,000 square feet at the west work area and 1,400 square feet at the east work area, with only one work area dewatered at a time. Fish salvage will include seining (herding) and netting. NMFS estimates that 10 juvenile steelhead will be successfully salvaged and relocated from the in-water work areas, with 2 juvenile steelhead (less than one adult equivalent) experiencing sufficient harm to result in injury or death. The extent of take will be exceeded if salvage activities result in the death of more than two juvenile steelhead, or if more than 4,500 square feet of Garrison Creek is dewatered.

Take in the form of harm caused by the temporary increases in turbidity will be manifested in altered behaviors including avoidance of the area, abandonment of cover, and exposure to predators. NMFS estimates seven juvenile steelhead (less than one adult equivalent), will be harmed by turbidity plumes which extend 100 feet downstream of isolated areas. The extent of take will be exceeded if increased turbidity alters the behavior of seven juvenile steelhead, or if the downstream extent of turbidity plumes exceeds 100 feet below each work area.

In contrast to the fish affected by capture, NMFS is unable to estimate the number of fish harmed by loss of forage. In circumstances where NMFS cannot numerically predict the amount of take, we estimate the extent of take by describing the extent of habitat modified by the proposed action (51 FR 19926). This surrogate represents an observable metric of the extent of take, which if exceeded, would trigger consultation. The extent of modified habitat is 7,000 square feet. This is equivalent to the maximum area of riverbed that will be isolated and dewatered, and the downstream extent of the temporary turbidity plumes in the water column (up to 100 feet downstream from each work area). This description of the extent of modified habitat is the extent of take exempted from the prohibition against take in this statement.

Juvenile steelhead migration will be obstructed for 5 days in 200 feet of Garrison Creek at the west work area and for 5 days in 150 feet of Garrison Creek at the east work area. NMFS is also unable to estimate the number of fish that will be obstructed. Therefore, we will use the duration of and extent modified habitat as a surrogate for the amount of take. This surrogate represents an observable metric of the extent of take, which if exceeded, would trigger consultation. The extent and duration of modified habitat is 200 linear feet for 5 days at the west work area, and 150 linear feet for 5 days at the east work area. This is equivalent to the maximum length of riverbed that will be isolated and dewatered, and the maximum duration of isolation barriers in the stream, in each work area. This description of the extent of modified habitat is the extent of take exempted from the prohibition against take in this statement.

The amount of take and the extent of take are the thresholds for reinitiating consultation. If any of these limits are exceeded during project activities, the amount of take would increase beyond that examined in this consultation, and thus the reinitiating provisions of this opinion apply.

2.9.2. Effect of the Take

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

2.9.3. Reasonable and Prudent Measures

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

The Department of Agriculture shall:

1. Avoid or minimize take due to construction activities.

2. Minimize incidental take during work area isolation and fish salvage efforts.

3. Track, monitor, and report on the proposed action to ensure that the project is implemented as proposed, and the amount and extent of take is not exceeded.

2.9.4. Terms and Conditions

In order to be exempt from the prohibitions of section 9 of the ESA, the Federal action agency must comply (or must ensure that any applicant complies) with the following terms and conditions. The USDA, 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. Conduct all work below the OHWM within as short a period as possible between July 15 and September 30.

    b. Confine all impacts to the minimum area necessary to achieve project goals.

    c. Select heavy equipment that will have the least possible adverse effect to the environment, considering factors including, but not limited to, equipment that has the ability to conduct work from existing disturbed areas, exert the least soil compaction impact, and minimize the amount of vibration and noise that could disturb aquatic species.

    d. To the extent feasible, work with heavy equipment from the top of the Garrison Creek streambank, unless work from another location will result in less habitat disturbance.

    e. Conduct turbidity monitoring as follows:

        i. Monitoring will be conducted daily, every 4 hours during daylight hours, when in-water work is conducted.

ii. Observations shall occur daily before, during, and after commencement of in-water work and compared to observable sediment load upstream of the action area.

iii. Monitor pumped releases of water daily for visible turbidity plumes.

iv. Measure or observe background turbidity levels at an undisturbed site within the flow channel approximately 100 feet upstream of the project area.

v. Measure or observe compliance measures in the flowing channel approximately 100 feet downstream from the project area, or within any visible turbidity plume.

vi. If a visible plume is observed at 100 feet downstream, measurements should not exceed above 10 percent of the background measurements. If there is exceedance, best management practices will be modified to minimize downstream increase of turbidity and fine sediments. Monitoring will be continued every 4 hours. If plume is observed after 8 hours, work shall be stopped for the remainder of the 24-hour day.

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

    a. A fish biologist with experience supervising fish exclusion operations will supervise or conduct all fish exclusion and handling activities.

    b. Complete work below the OHWM between July 15 and September 30. In-water work occurring outside of this timeframe will require written approval from NMFS.

    c. Minimize area dewatered. Where dewatering will occur, slowly decrease flow into area to be isolated. Herd and net fish out of area as water recedes to ensure no fish are stranded.

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

    a. Track and monitor construction activities to ensure that the conservation measures are meeting the objective of minimizing take. Monitoring shall be conducted by the USDA or contractor, and include a daily visual survey for fish in the areas adjacent to construction and inside the in-water work area.

    b. Submit a completion of project report to NMFS two months after project completion. The completion report shall include, at a minimum, the following:

        i. Starting and ending dates for work completed, with in-water work period specified.

        ii. Method used to isolate each work area.

iii. Total area of in-water work. Include area of each work location isolated and or/dewatered.

iv. Duration isolation materials were in place at each work area.

v. Total area of vegetation removal.

vi. Any daily observed sediment plume from the in-channel work area to 100 feet downstream during the 11-week in-water construction period.

vii. A summary of pollution and erosion control inspection results, including results of implementing required best management practices, and including a description of any erosion control failure, contaminant release, and efforts to correct such incidences.

viii. Number and species of fish observed injured or killed in Garrison Creek.

ix. Description of all capture and release methods employed including:

1. Supervisory fish biologist name and address.

2. Methods used.

3. Number of fish captured by species.

4. Location and condition of all fish released.

5. Observation of injury or mortality.

x. Reference to NMFS consultation number WCRO-2021-02377.

c. All reports will be sent to: crbo.consultationrequest.wcr@noaa.gov.

d. If the amount or extent of take is exceeded, stop project activities and notify NMFS immediately.

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 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).

The State of Washington's Walla Walla Water 2050 plan is a 30-year integrated water resources and strategic management plan for management and enhancement of water resources critical to improving instream flows for fish, sustaining municipal water supplies, and an agricultural economy. NMFS recommends that the USDA work with Walla Walla Basin stakeholders on

implementation of the Walla Walla 2050 plan, particularly strategies and actions that increase flow, improve fish passage, increase floodplain connectivity, increase extent and function of riparian vegetation, and increase habitat complexity. Implementation of these strategies will improve PBFs and abundance and distribution of MCR steelhead.

2.11. Reinitiation of Consultation

This concludes formal consultation for the City of College Place Wastewater Treatment Plant Upgrade Project.

Under 50 CFR 402.16(a): "Reinitiation of consultation is required and shall be requested by the Federal agency or by the Service where Federal agency involvement or control over the action has been retained or is authorized by law and: (1) If the amount or extent of taking specified in the incidental take statement is exceeded; (2) If new information reveals effects of the agency action that may affect listed species or critical habitat in a manner or to an extent not previously considered; (3) If 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 written concurrence; or (4) If a new species is listed or critical habitat designated that may be affected by the identified action."

3. 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.

3.1. 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 USDA. Other interested users could include the City of College Place and J-U-B Engineers, Inc. Individual copies of this opinion were provided to the USDA. 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.

3.2. Integrity

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

3.3. 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 Magnuson–Stevens Fishery Conservation and Management Act implementing regulations regarding Essential Fish Habitat, 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 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 reviewed in accordance with West Coast Region ESA quality control and assurance processes.

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