Biological Assessment for

Bridge Creek Ranch Diversion

Wheeler County, Oregon

NWP-2023-333

February 13th, 2024

Lead Federal Action Agency: U.S. Army Corps of Engineers

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I. Executive Summary

The Federal action agency for this project is the U.S. Army Corps of Engineers and the permit applicant for the project is Resource Specialists Inc. This project seeks to install a new irrigation water diversion structure, associated pipelines, and fish screen on/along Bridge Creek, a tributary to the John Day River in Wheeler County, Oregon. Bridge Creek is an ESA listed Steelhead (*Oncorhynchus mykiss*) stream for the Middle Columbia River Distinct Population Segment. The diversion will replace an existing water diversion located 2,100 feet upstream, resulting in water remaining in-stream longer on a flow limited system.

Listed species and Designated Critical Habitats (DCH) possibly present within the Action Area, their listing status, and the effects determinations are provided in the following table.

SPECIES / DPS / DCH	**LISTING STATUS**	**DETERMINATION**
Gray Wolf (*Canis lupus*)	Endangered	No Effect
Steelhead (*Oncorhynchus mykiss*) [Middle Columbia River DPS]	Threatened	Likely to adversely affect
Designated Critical Habitat for MCR steelhead (*O. mykiss*)	DCH / Final	Will not adversely modify

No Gray Wolves were observed at the project site during multiple field visits. In 2018 a wolf was sighted by multiple individuals on the north slopes of the Ochocos, approximately 14 miles SE of the project location, however no known wolf sightings have occurred in close proximity to the project area. The effects to *C. lupus* will be limited to the period of construction as the permanent structures will not pose any issue for the species. Based on the scarcity of *C. lupus*, and their general avoidance of human interaction, it is anticipated that the construction activities will have **no effect** on that species.

This document describes the anticipated effects to both threatened MCR steelhead and the Designated Critical Habitat of Bridge Creek.

II. Project Description

1. Project Location

The project site is located 8 miles NW of Mitchell, Wheeler County, Oregon.
Lat./Lon.: 44.6511° N, 120.2472° W.
The project is located on Bridge Creek, a tributary to the John Day River. A vicinity map is provided below in Figure 1. Site photos are provided in **Appendix A**.

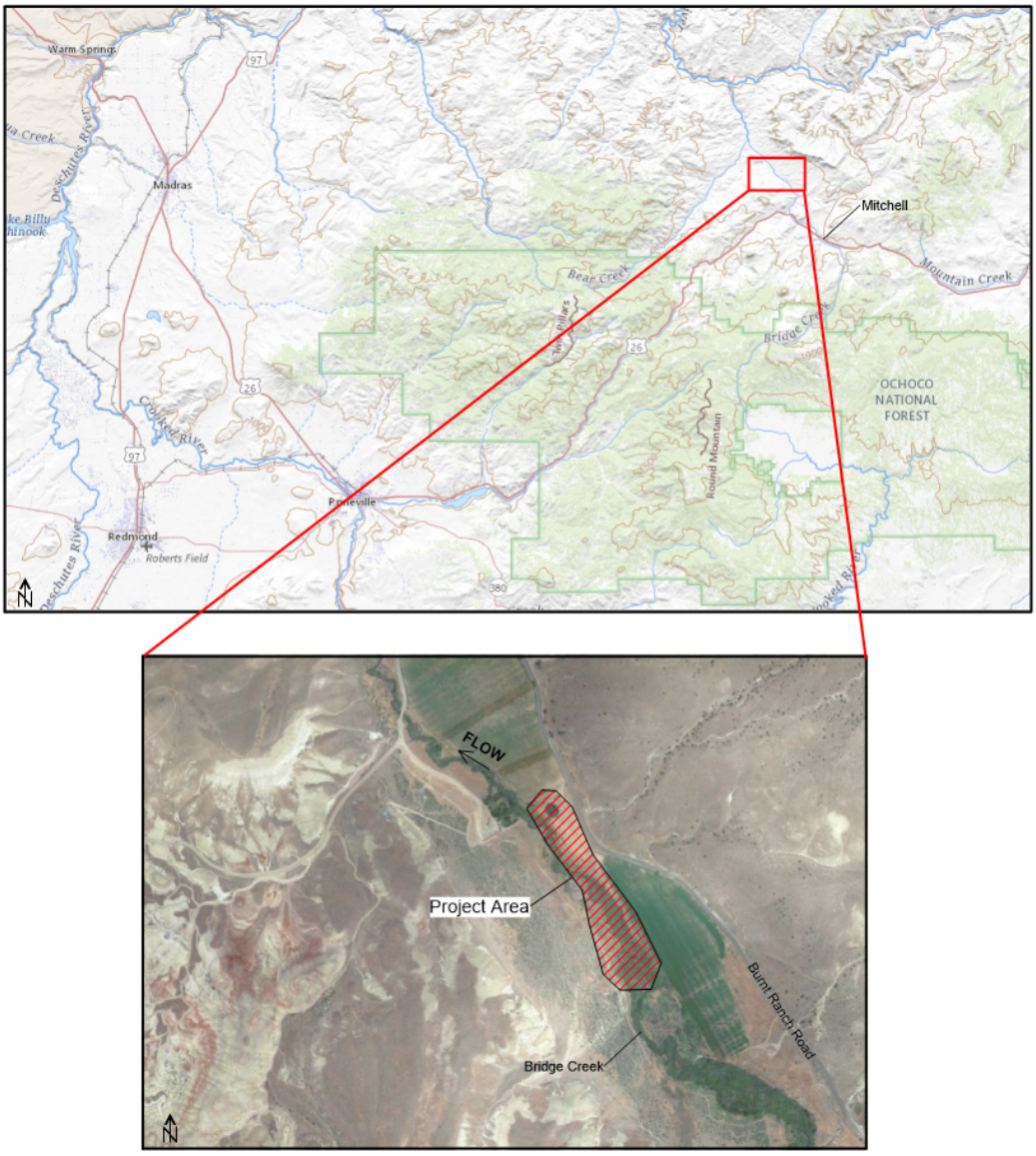

Figure 1 - Vicinity map of project area

2. Definition of Action Area

The project is in close proximity to the Painted Hills National Monument. A map showing the project elements, Project Footprint, and Action Area is shown below in Figure 2.

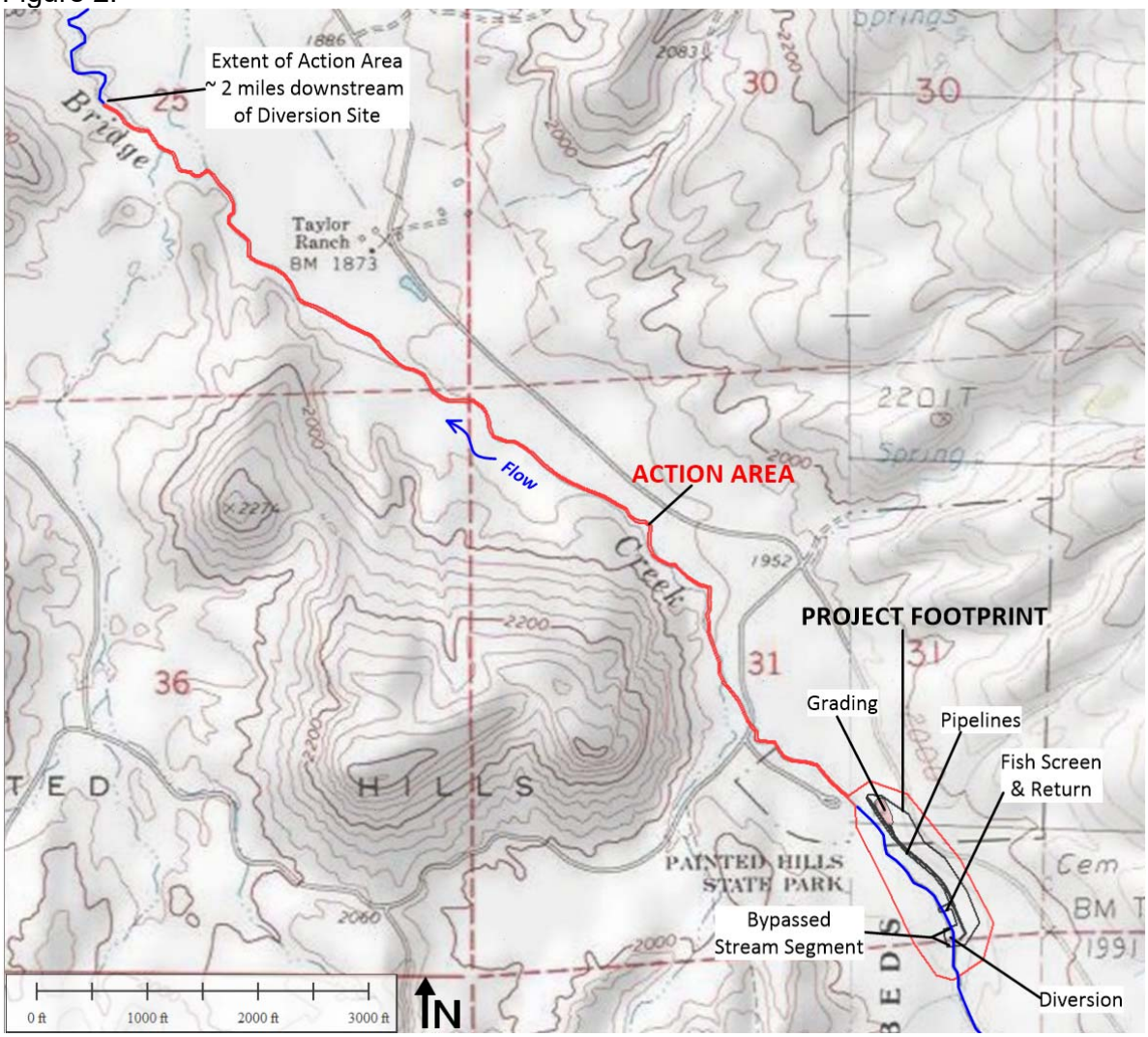

Figure 2 - Project Footprint and Action Area

All earth moving activities and vehicle/equipment disturbance will be limited to the Project Footprint Area. The Project Footprint Area includes staging areas, areas where pipelines will be installed, grading around the pond, fish screen and return pipe, along with the diversion and in-stream isolation area. The actual distance of disturbance within Bridge Creek is limited to the 100 ft section that will be bypassed. Disturbance activities will include increased noise, decreased air quality, direct disturbance of the ground through excavation and placement of earth and materials and the resulting physical habitat alterations. The Action Area includes a buffer around the Project Footprint Area to account for the impacts of the increased noise, dust, and general ground disturbance. The Action Area extends 2 miles below the diversion site and is

limited to the in-stream reach of Bridge Creek. This extended area accounts for unavoidable increases in turbidity that could take a significant amount of time to become undetectable.

3. Proposed Action

NOTE: All in-stream project activities will be performed during the ODFW in-stream work window of July 15 – Sept. 30. Using construction methods other than those described in this document requires approval/concurrence from the National Marine Fisheries Service (NMFS).

The proposed project involves the construction of a new water diversion and pipeline on Bridge Creek located on Bridge Creek Ranch in Wheeler County.
The diversion to be installed will be replacing an existing upstream diversion with a maximum diversion rate of ~ 3 CFS. The point of diversion being moved downstream to the new location will leave this water in-stream an additional 2,100 feet, causing significant uplift in this section during the late summer months where the stream becomes water limited. No changes are proposed to the amount of water being withdrawn from Bridge Creek, just the point of diversion.

The project will include the installation of a new concrete diversion, steel control box, fish screen (with return pipe), and pipeline to aid in the irrigation for the ranch. An overview from the design plans detailing access routes, staging areas and work elements is shown below in Figure 3.

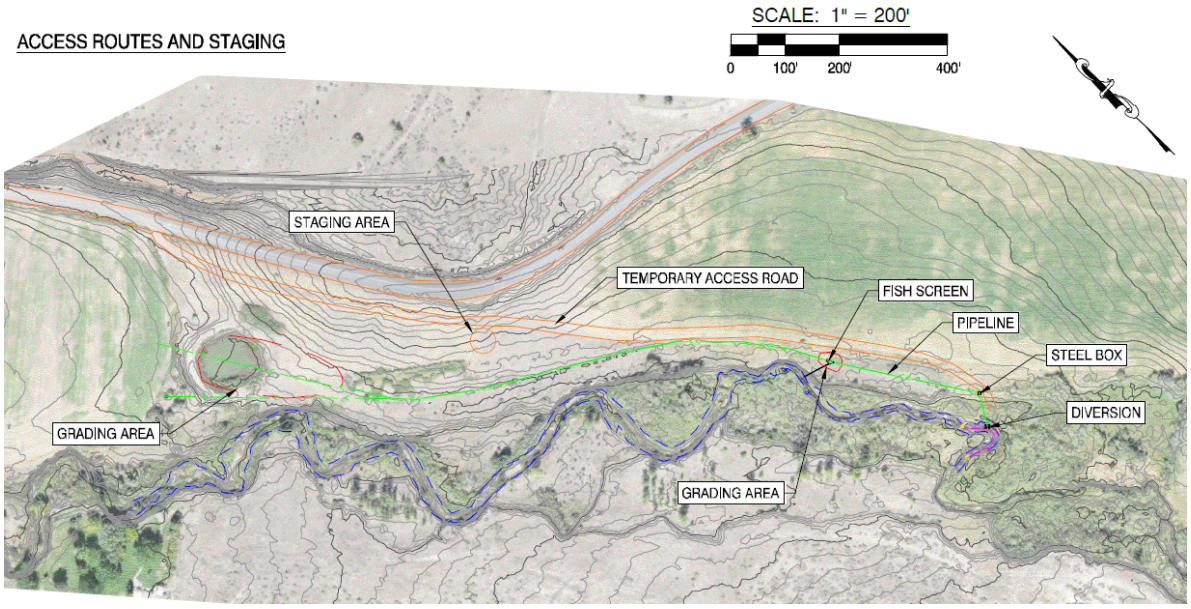

Figure 3 - Project elements and overview with aerial image

A detail of the affected stream area with callouts for water-bypass are shown below in Figure 4.

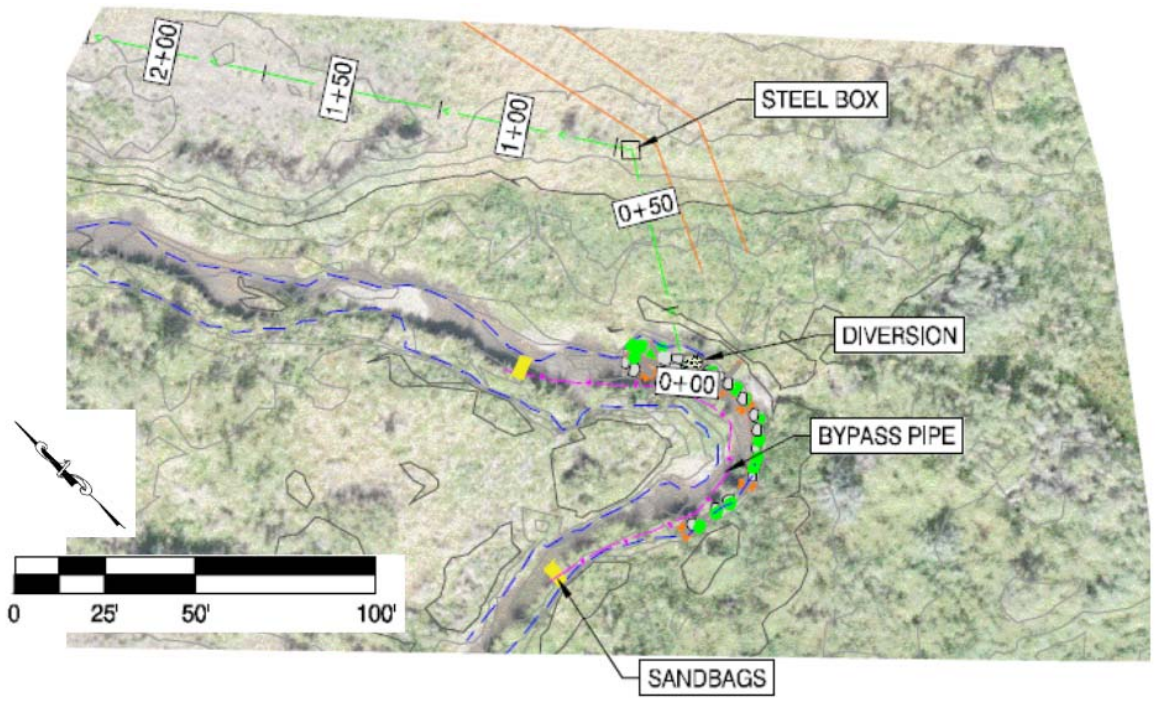

Figure 4 - Detail of modified stream segment with bypass callouts

The total distance of stream to be bypassed will be approximately 100 feet. The bypass will be implemented by using sandbags and plastic sheeting to form a coffer dam at the upstream end. The water will be routed into a pipe that will carry it past the project extent. Pipe sizing will be determined based on snowpack and historical discharge data roughly one month prior to construction.

Fish salvage from the isolated area carries with it the highest probability of negatively impacting *O. mykiss* and other aquatic species. Salvage protocols have been borrowed and slightly modified from those received from a personal communication with Tim Porter (ODFW, Pers. Comm. 2024). "*All fish salvage will be overseen by a qualified and permitted biologist. All fish salvage activities shall occur prior to initiation of any in-stream construction activities. The directing biologist will work with the appropriate construction personnel to plan the staging and sequence for work area isolation, fish capture and removal, and dewatering. The plan will depend on flow levels within Bridge Creek but will generally follow the proceeding guidelines.*

Where the area to be isolated is small, shallow, and/or conditions are conducive to fish capture, it may be possible to isolate the work area and remove all fish life prior to dewatering. Where the area to be isolated is large, deep, flow volumes or velocities are high, and/or conditions are not conducive to easy fish capture, it may be necessary to commence with dewatering in conjunction with fish capture and removal. Dewatering of the work area should occur slowly (1-2 inches/hr) and the site should be monitored during dewatering for stranded organisms. Dewatering will be performed by gradually raising the height of the upstream coffer dam in order to route a larger percentage of flow down the bypass pipe.

In many instances where gradual dewatering is staged in conjunction with fish capture and removal, it is appropriate to delay installation of the downstream barrier until after fish have been given sufficient time to move downstream by their own volition. Fish salvage may utilize trapping, seining or electrofishing techniques. To minimize the risk of injury, the preferred order of collection techniques is trapping/seining followed by electrofishing. Electrofishing will be performed only when other methods of fish capture and removal have proven impracticable or ineffective at removing all fish. The directing biologist will ensure that attempts to seine and/or net fish always precede the use of electrofishing equipment. If electrofishing equipment is used to capture fish, comply with NMFS Electrofishing Guidelines (NMFS 2000)."

The diversion structure will be a concrete wall situated on a corner with no channel spanning structures. The proposed diversion is 9' long by 5'6" wide by 6' 8" high. Approximately 50' of 24" steel pipe will be installed from the diversion to a steel box, then the pipeline will continue in 24" ADS plastic pipe to the fish screen. Two separate pipelines will exit the fish screen, 1) ~1250' of 12" PVC will be installed from fish screen to the existing irrigation mainline and 2) ~950' of 15" PVC will be installed from the fish screen to an existing irrigation pond. Bio-engineered bank stabilization will be installed in the vicinity of the fish screen to prevent channel migration and promote structure longevity. Minor grading will occur around the proposed fish screen location and the pond. Engineering details of the in-stream work is shown below in Figure 5.

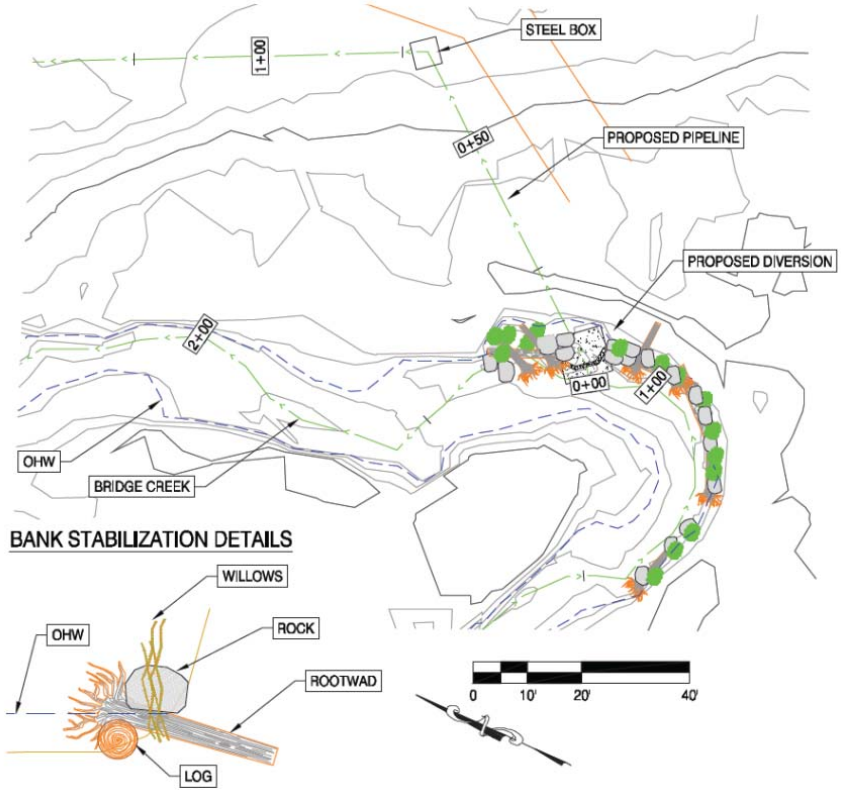

Figure 5 - Engineering details of bank stabilization near diversion site

The fish screen will be designed and installed by Oregon Department of Fish and Wildlife (ODFW) John Day Screen Shop. The screen will be a paddle wheel driven drum screen; a proven design that has been widely implemented in the John Day Basin. The screen will be designed to meet all Oregon and National (NMFS) fish screen requirements for areas where fry are present. These include a maximum approach velocity of 0.4 ft/s, a sweeping velocity in excess of the approach velocity, maximum screen hole size of 3/32", and drum submergence of 65% to 85% of drum diameter. Other standard fish screen features will be included such as a fish bypass system Further details on the fish screen are available from the ODFW John Day Screen Shop.

Construction activities will be performed using a mid-size (~30k lb) tracked excavator. Once the area is isolated the excavator will perform the excavation for the concrete wall followed by the pipeline and associated off-channel structures. The infrastructure will be backfilled to grade and the bank stabilization will be constructed. Once all in-stream construction activities are complete the coffer dams and bypass pipe will be removed and the site will be allowed to free-flow. The water bypass is expected to be in place a maximum of two weeks. Other areas of disturbance including the fish screen and pipeline installations will require an additional two to three weeks of work.

4. Schedule and Duration

The anticipated start date of the project is July 15, 2024. This is the start of the ODFW in-water work window for the region. The project will start with the stream isolation/bypass installation. All in-stream work will then be completed as efficiently as possible in order to minimize isolation time. The time period of isolation is anticipated to be less than two weeks, and likely closer to one week. Once the stream is returned to its natural course the remainder of the project will be installed in the areas outside the stream channel. The total project time is anticipated to be less a month in total.

III. Description of the Species and their Habitats

A. Species Information: Middle Columbia River Steelhead
The Middle Columbia River (MCR) steelhead distinct population segment (DPS) includes all naturally spawning populations of steelhead using the John Day River and Bridge Creek. The MCR steelhead DPS was listed as threatened on March 25, 1999 (64 FR 14517) and its threatened status was reaffirmed on June 28, 2005 (70 FR 37160) and August 15, 2011 (76 FR 50448). NMFS has defined DPSs of steelhead to include only the anadromous members of this species (70 FR 67130). Many steelhead populations along the U.S. West Coast co-occur with conspecific populations of resident rainbow trout. There may be situations where reproductive contributions from resident rainbow trout may mitigate short-term extinction risk for some steelhead DPSs (Good et al. 2005, 70 FR 67130). We assume that any benefits to an anadromous population resulting from the presence of a conspecific resident form will be reflected in direct measures of the current status of the anadromous form (Northwest Fisheries Science Center, 2015).

NMFS has identified 17 extant populations in this DPS. The populations fall into four major population groups: the Yakima River basin (four extant populations; two of them—Naches and Upper Yakima--migrating past Wapato Dam), the Umatilla/Walla Walla drainages (three extant and one extirpated populations), the John Day River drainage (five extant populations), and the Eastern Cascades group (five extant and two extirpated populations).

Life History. Young steelhead typically rear in streams for some time before migrating to the ocean as smolts. Steelhead smolts have been shown to migrate at ages ranging from 1 to 5 years throughout the Columbia Basin, but most steelhead generally smolt after 2 years in freshwater (Busby et al. 1996). Some juveniles move downstream to rear in larger tributaries and mainstem rivers.

Based on catch data, juvenile steelhead tend to migrate directly offshore during their first summer, rather than migrating nearer to the coast. Maturing Columbia River steelhead are found off the coast of Northern British Columbia and west into the North Pacific Ocean (Busby et al. 1996). Available fin-mark and coded-wire tag data suggest that winter steelhead tend to migrate farther offshore but not as far north into the Gulf of Alaska as summer steelhead (Burgner et al. 1992). At the time adults are (re-)entering freshwater, tagging data indicate that immature Columbia River steelhead are out in the mid-North Pacific Ocean.

Most steelhead spend 2 years in the ocean (range 1 to 4 years) before migrating back to their natal streams (Shapovalov and Taft 1954; Ward and Slaney 1988). Once in the river, steelhead apparently rarely eat and grow little, if at all. These combined behaviors produce fish that range between 3 and 7 years of age at the time of spawning All steelhead upstream of The Dalles Dam (such as those in the action area) are summer-run fish that enter the Columbia River from June to August (Reisenbichler et al. 1992). Adult steelhead ascend mainstem rivers and their tributaries throughout the winter,

spawning in the late winter through spring. Fry emergence typically occurs between May and August.

Limiting Factors. The major factors limiting recovery of the MCR steelhead DPS include: (1) Mainstem Columbia River hydropower system mortality, (2) reduced streamflow in tributaries, (3) impaired passage in tributaries, (4) excessive sediment, (5) degraded water quality, and (6) altered channel morphology (NMFS 2009).

Critical Habitat. Critical habitat for MCR steelhead has been designated in the majority of the John Day Basin including Bridge Creek. Critical habitat includes the stream channels to the lateral extent defined by the ordinary high water mark (33 CFR 319.11). Only those habitats that are occupied and contain certain habitat attributes called "primary constituent elements" (PCEs) that are essential to support one or more life stages are designated critical habitat.

The critical habitat of the Middle Columbia River DPS steelhead with the project location identified is shown below in Figure 6.

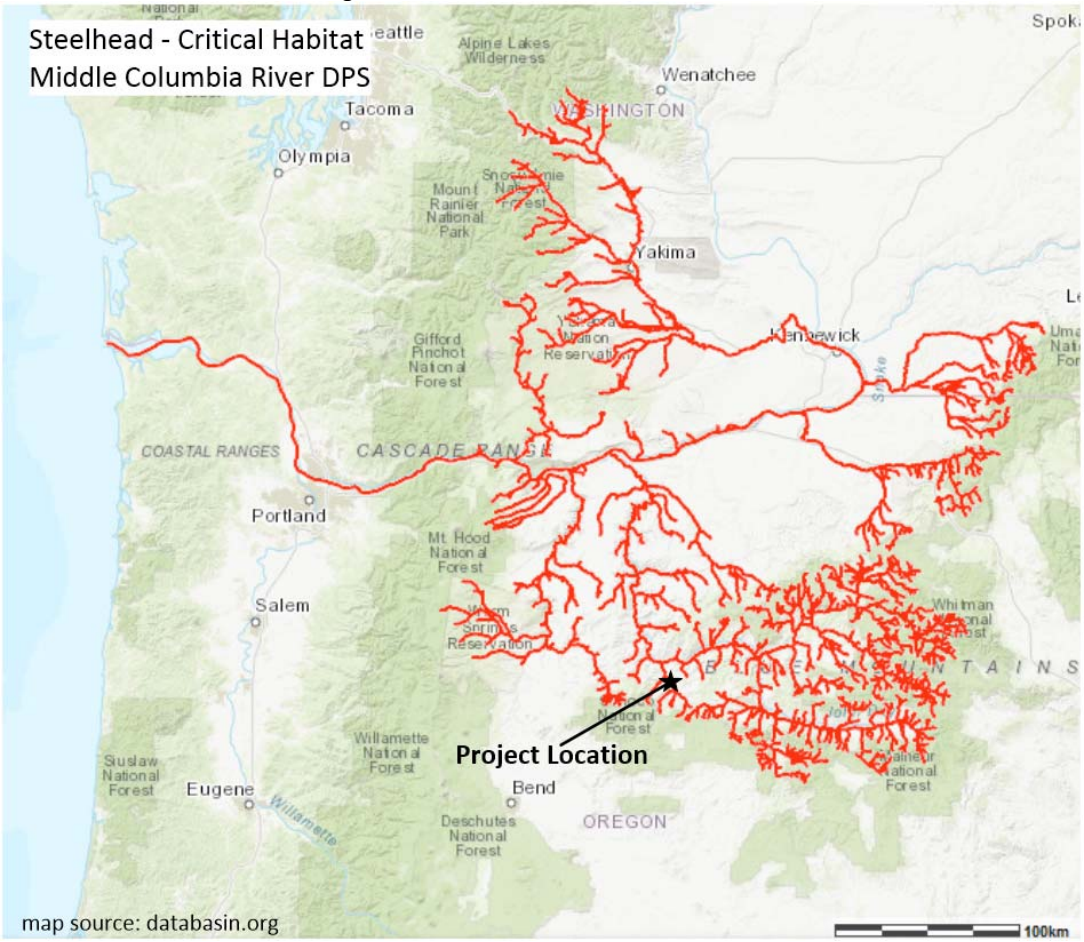

Figure 6 - Map of critical habitat for Middle Columbia River DPS Steelhead

Many factors, both human-caused and natural, have contributed to the decline of the functional condition of the essential features of PCEs of designated critical habitat. Steelhead habitat has been altered through activities such as urban development, logging, grazing, power generation, and agriculture. These habitat alterations have resulted in the loss of important spawning and rearing habitat and the loss or degradation of migration corridors. The following are the major factors that impair the essential features of the PCEs within designated critical habitat for MCR steelhead:

1. Mainstem Columbia River hydropower system mortality (freshwater migration corridors without obstructions),
2. Reduced tributary stream flow (freshwater spawning sites with water quantity conditions supporting spawning, incubation, and larval development; freshwater rearing sites with water quantity to form and maintain physical habitat conditions that support juvenile growth and development),
3. Impaired passage in tributaries (freshwater rearing sites with water quantity to form and maintain physical habitat conditions that support juvenile growth and development; freshwater migration corridors with water quantity conditions supporting juvenile and adult mobility and survival),
4. Excessive sediment in tributaries (spawning sites with substrate to support egg incubation and larval growth and development; juvenile migration corridors and rearing sites with forage to support juvenile growth and development),
5. Degraded tributary water quality (spawning sites with water quality to support egg incubation and larval growth and development; juvenile rearing sites and migration corridors with water quality supporting juvenile growth and development),
6. Altered tributary channel morphology (freshwater spawning sites with water quantity and quality conditions and substrate supporting spawning, incubation and larval development; freshwater rearing sites with floodplain connectivity to form and maintain physical habitat conditions that support juvenile growth and development), and
7. Climate change is expected to alter critical habitat by generally increasing temperature and peak flows and decreasing base flows. Although changes will not be spatially homogenous, effects of climate change will generally decrease the capacity of critical habitat to support successful spawning, rearing, and migration.

O. mykiss are routinely observed throughout Bridge Creek and ODFW lists summer steelhead as present in the system. No in-stream surveys were conducted in the preparation of this document and MCR steelhead are assumed present at the site. Some fish population information is available from a past culvert replacement project that occurred less than a mile downstream from the project area in 2010. Exact dates of the isolation are not available, however the project was installed during the in-water work window, suggesting a mid-to-late summer time period. During this project, a 200' section of Bridge Creek was bypassed and fish were salvaged within the bypassed section. Of all the fish salvaged, not a single *O. mykiss* was observed (Gabe Williams, Pers. Comm., 2024). The majority of the fish salvaged were dace with several smallmouth bass also found. It is thought that the section of Bridge Creek at the project

area routinely suffers from poor water quality due to reduced flow conditions during the mid to late summer months. The degraded conditions (especially high temperatures) likely lead to resident *O. mykiss* seeking alternative habitat during this period.

Table 2-1 (below) from the Middle Columbia Steelhead ESA Recovery Plan (NMFS 2009) details the life stage, timing and key habitat for MCR steelhead.

Table 2-1. Key habitat requirements by life stage and time period for steelhead.

Life Stage	Relevant Months	Key Habitat Descriptions
Spawning	Mar-Jun	Riffles, tailouts, and glides containing a mixture of gravel and cobble sizes with flow of sufficient depth for spawning activity.
Incubation	Mar-Jun	Riffles, tailouts, and glides as described for spawning, with sufficient flow for egg and alevin development.
Fry Colonization	May-Jul	Shallow, slow velocity areas within the stream channel, often associated with stream margins.
Active Rearing	0-age May-Jul; 1-age, Mar-Oct; 2+-age, Mar-Oct	Gravel and cobble substrates with sufficient depth and velocity, and boulder/large cobble/wood obstruction to reduce flow and concentrate food.
Inactive Rearing	0,1-age Oct-Mar	Stable cobble/boulder substrates with interstitial spaces.
Migrant	1-age, Mar-Jun 2+-age, Mar-Jun	All habitat types having sufficient flow for free movement of juvenile migrants.
Prespawning Migrant	Winter, Nov-Apr Summer, All	All habitat types having sufficient flow for free movement of sexually mature adult migrants.
Prespawning Holding	Winter, Dec-May Summer, All	Relatively slow, deep-water habitat types typically associated with (or immediately adjacent to) the main channel.

The proposed in-stream work will be limited to the ODFW in-stream work window for Bridge Creek of July 15 – September 30. ODFW restricts in-stream work to this time period in order to minimize the impacts to sensitive aquatic species including steelhead. The only life stage to be directly affected by the proposed project would be rearing juveniles.

Photographs of the site are provided in Appendix A.

IV. Environmental Baseline

The environmental baseline, as defined under the ESA, consists of past and present impacts of all federal, state, or private actions and other human activities in action areas; the anticipated impacts of all the proposed federal projects in an action area that have already undergone formal or early Section 7 consultation; and the impact of state or private actions that are contemporaneous with the consultation process (50 CFR 402.02).

Bridge Creek flows from the north slopes of the Ochoco Mountains northward until it flows into the John Day River. The stream starts in National Forest land before transitioning to predominantly agricultural land for the remainder of its journey. Bridge Creek is predominantly single thread and significant down cutting has occurred (likely due to past agricultural activities) in the lower reaches of the watershed. Floodplain interactions in these areas have become limited with a modest inset floodplain existing 4'-8' below the main valley floor.

Primary land uses in the area are irrigated agriculture/grazing on private land and recreation on the areas of public lands. Irrigation withdrawals are prevalent throughout the private lands of Bridge Creek. The system is over adjudicated resulting in low flows during the the summer.

Middle Columbia River steelhead and their critical habitat are affected by a number of habitat modifications within the action area. The most prominent modifications are the result of irrigation and agricultural activities.

Water quality in the action area can be poor due to diminished streamflow and contribute to high temperatures that can impact native fish populations and produce instream conditions that invigorate nonnative predators (smallmouth bass).

Over the past 20 years there has been a concerted effort to improve conditions for MCR steelhead within the Bridge Creek basin. These have included fish passage and irrigation efficiency projects sponsored by the local Wheeler County Soil and Water Conservation District and other agencies. Beaver dam analogs have been installed through roughly 5 miles of Bridge Creek both upstream and downstream of the Action Area. These have been widely accepted as a large success by encouraging additional beaver activity and significantly improving the degree of floodplain interaction through the treated reaches.

V. Effect of the Action:

Life stage analysis shows that only rearing juveniles are likely to be impacted. The largest impacts will occur during construction with the water bypass disturbance to Bridge Creek. The work area along Bridge Creek will be isolated with a bypass pipe and fish salvage will be conducted. The bypass and stream isolation is expected to be in place a maximum of two weeks. Bank stabilization materials and the concrete headwall will be permanent fixtures along Bridge Creek. There will be a small amount of stream habitat lost at the diversion wall, however the complexity of the habitat upstream and downstream of the wall will be improved with the addition of the rootwads, creating a complex in-stream environment. The project will be installed during the ODFW in-stream work window for the area (July 15 – Sept 30) in order to minimize disturbance during construction. The effects of the action will include disturbance during the bypass installation and resulting fish salvage. Some increased turbidity will occur while implementing the bypass as well as when the bypass is removed. Fish will also not have access to the habitat present within the 100' isolated section during construction. These effects will be temporary and minor. Turbidity monitoring will occur according to protocols in the Oregon DEQ 401 water quality certificate. Other impacts during construction would be an increase in noise from the equipment. Stream temperature and dissolved oxygen content will not be impacted by the proposed work.

The existing point of diversion is located 2100' feet (stream length) upstream of the proposed location. Once this project is constructed, the 3+ CFS of diverted water will remain instream 2100' longer than the current configuration. This will provide significant uplift to this area during periods of low-flow in mid to late summer.
This instream work and is not likely to adversely affect the *O. mykiss* in Bridge Creek, with long term post-project effects resulting in a net uplift for the species.

The effects outside of Bridge Creek include the installation of several sections of pipeline, a steel control box, and a fish screen. These project elements will have no effect to in-stream species including *O. mykiss*.

Standard BMPs will be implemented including staging and fueling only occurring in the designated staging area (> 150 ft away from Bridge Creek), environmentally friendly biodegradable hydraulic fluid in the excavator, spill kits present on-site, straw waddles and sediment fencing installed as appropriate, use of existing roadways to the maximum extent possible, disturbance to sensitive areas will be kept to the minimum extent possible, hard equipment turns will be avoided, equipment will be cleaned prior to delivery on-site, etc.

The project will be installed during the ODFW in-stream work window in order to minimize in-stream impacts to aquatic species. The work area will be isolated with a bypass pipe during construction. The concrete diversion structure will be pre-cast in order to minimize disturbance time as well as environmental concerns associated with a concrete pour. Additional plantings within the riparian area are proposed as mitigation for the minor permanent impacts of the diversion and fish screen. The installation of the

fish screen can be considered a conservation measure to ensure that fish do not get entrained into the irrigation system.
The pipeline route was adjusted to minimize the length of wetland that is transected.
The location of the steel control box and fish screen are in areas that show no wetland indicators through a test pit investigation.
Turbidity monitoring protocols in accordance with Oregon DEQ 401 WQ certification will be performed while in-stream work is being conducted.
Part of restoring the site after construction will include implementing a planting plan. The plan calls for planting a mixture of native riparian species including yellow willow and greenleaf willow (*Salix lutea, S.lasiandra*), red-osier dogwood (*Cornus sericea*) and black cotonwood (*Populus balsamifera*). A total of 105 rooted stock plantings will be installed with caging for protection from browse and beavers.

VI. Determination of Effect

This project **is likely to adversely affect** MCR steelhead. The isolation of the stream channel and subsequent fish salvage will be temporary, however will be highly impactful to any juveniles in the system at that location. The bank stabilization with the rootwads will provide long term beneficial habitat complexity. While the bypass is in place, it is likely that upstream fish passage through the bypass pipe will be limited. The population stage effected will be limited to rearing juveniles; with no up-migrating adults present in the system during the in-water work window. It is anticipated that the bypass will be in place for approximately two weeks, resulting in minimal overall disturbance. The project is not likely to jeopardize the continued existence of MCR steelhead.

This project **will not adversely modify critical habitat** of MCR steelhead. The permanent diversion wall will be insignificant in magnitude when compared to the uplift provided by the local habitat enhancements along with allowing 3+ CFS of water to remain in-stream an additional 2,100 ft. The freshwater rearing PCE will be temporarily affected by degraded water quality but will be for a very short period of time and will dissipate rapidly with distance. The temporary nature of the degradation of water quality, combined with its limited magnitude and spatial extent, make the effects of the action on the freshwater PCE minor. Therefore, the proposed action will not significantly affect the conservation value of the freshwater rearing PCE in the action area.

The long-term effect on *O. mykiss* in Bridge Creek due to this project will be a net positive due to the diverted water remaining in-stream longer and improved in-stream and riparian habitat within the project area.

VII. References and Personal Communications Cited

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APPENDIX A

Site Photographs


Bridge Creek Diversion - Photo Locations
6
5
4
2
3
1
0 ft
100 ft
200 ft
300 ft
400 ft
N


1


2


3


4


5


6


N


N