US Army Corps of Engineers ®
Walla Walla District
BUILDING STRONG®

MILL CREEK FISH PASSAGE PROJECT
SECTION 408 PERMISSIONS
WALLA WALLA, WASHINGTON

ENVIRONMENTAL ASSESSMENT

Project Number PM-EC 2015-0049

April 2016

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1. INTRODUCTION

1.1 Introduction

The Walla Walla District Corps of Engineers (Corps) proposes to grant a series of permissions pursuant to 33 United States Code (USC) Section 408 (Section 408), and Engineer Circular EC 1165-2-216, for alterations to portions of the Corps-constructed Mill Creek flood risk management channel in Walla Walla, Washington. The purpose of the alterations would be to improve fish passage conditions for native fish. These Section 408 permissions would apply to requests by the Mill Creek Work Group (MCWG) and/or its member organizations, which are endorsed by the Mill Creek Flood Control Zone District (Flood Zone District). Because these alterations would modify a structure constructed by the Corps, they require Section 408 permission from the Corps.

The Corps constructed the Mill Creek flood risk management channel in the 1940's to pass high flows and reduce the risk of flooding to the City of Walla Walla and surrounding communities. The Mill Creek channel begins at the Diversion Dam at Rooks Park, River Mile 11.5, and extends downstream, through downtown Walla Walla, to Gose Street Bridge, River Mile 4.8. The Corps subsequently turned over operation and maintenance of a six-mile portion of the channel from the Division Works (RM 10.6) to Gose Street Bridge (Figures 1 and 2) to the Flood Zone District. The Section 408 permissions addressed in this document would apply only to the six-mile portion of the channel operated and maintained by the Flood Zone District.

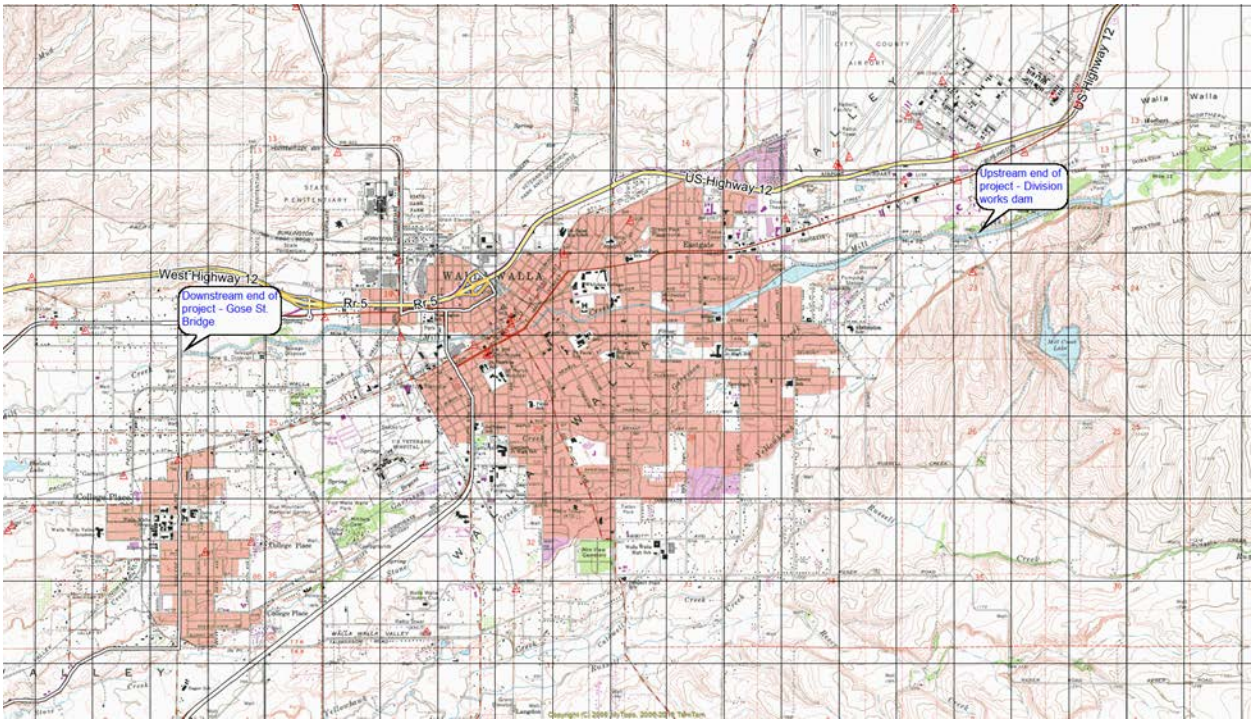

Figure 1 – Mill Creek Fish Passage Project location

Figure 2 – Aerial photo of Mill Creek Fish Passage Project location

The MCWG, primarily through one of its member organizations (Tri-State Steelheaders), has proposed a program for site-specific alterations to the Flood Zone District-maintained portion of the Mill Creek channel to improve fish passage conditions. The Flood Zone District has endorsed alterations by the MCWG under this program, subject to engineering and environmental reviews. The MCWG is a technical working group of entities with water interests pertaining to Mill Creek. The MCWG includes federal and state regulators, local governments, local tribes, and non-governmental organizations. For years, the MCWG had assumed that barriers existed in the Mill Creek channel based upon professional opinion and anecdotal information. In 2005, the Corps and Washington Department of Fish and Wildlife (WDFW) made a cursory evaluation of fish passage and determined fish passage was not totally blocked at all flows. Conclusions from that work prompted the MCWG to obtain a more formal fish passage assessment, which resulted in a final report in October 2009, *Mill Creek Fish Passage Assessment* (Burns, et.al, 2009). The fish passage assessment identified the location and type of fish passage barriers, developed a prioritized list of fish passage problems, and developed conceptual design options and cost estimates for correction of the problems. These conceptual designs form the basis of the program of channel modifications. The MCWG has previously implemented two phases of construction resulting in modification of the channel at four locations. The MCWG proposes to continue to implement the program through an on-going series of construction phases in the Flood Zone District-maintained portion of the Mill Creek channel, as funding becomes available, and if endorsed by the Flood Zone District.

This Programmatic Environmental Assessment (EA) addresses potential environmental effects associated with the granting of a series of Section 408 permissions for the program of fish passage improvement actions requested by the MCWG or its member organizations and endorsed by the Flood Zone District. The Corps prepared this Programmatic EA in compliance with the National Environmental Policy Act (NEPA) and the Corps' NEPA implementing regulations, Engineer Regulation (ER) 200-2-2 (33 CFR 230).

1.2 Purpose and Need

The Corps is proposing to grant a series of permissions in accordance with Section 408 and EC 1165-2-216 (or its successor) for alterations to the Flood Zone District-maintained portion of the Mill Creek channel by the MCWG or its member organizations to improve fish passage. The purpose of the Section 408 permissions is to allow alterations to the Mill Creek channel to improve fish passage while maintaining the integrity and original flood risk management purpose of the channel. The program is needed as the Mill Creek channel was not originally designed to provide adequate fish passage and can adversely affect populations of native salmonids in Mill Creek, including two species that are listed under the Endangered Species Act (ESA) - Mid-Columbia steelhead and bull trout.

The Corps will review all site-specific alteration plans to confirm compliance with Section 408 and EC 1165-2-216. To be considered for a Section 408 permission, any proposed site-specific alteration must comply with requirements and restrictions designed to protect the public interest and ensure the alteration would not harm the purpose of the Mill Creek channel. A checklist of these requirements is found in Appendix A. If a proposed alteration complies with these requirements, the Corps would prepare a Statement of Findings and approval letter granting Section 408 permission for that site-specific alteration.

The Mill Creek channel consists of two main types of construction: 1) rock-filled gabions or riprap armoring the creek banks and a series of 263 concrete or sheet pile sills spanning the width of the channel, and 2) a trapezoidal concrete-lined "flume" with a trench running the length of the center, alternating baffles within the trench, and vertical concrete dividers at some locations (Figure 3). There are four miles of armored channel and two miles of concrete-lined flume. About 1,400 feet of the concrete flume is underground. The armored channel is used in the upstream and downstream portions of the channel while the concrete flume runs through downtown Walla Walla and some of the adjacent residential areas (Figure 3). Neither type of construction was designed to provide year-round passage for fish.

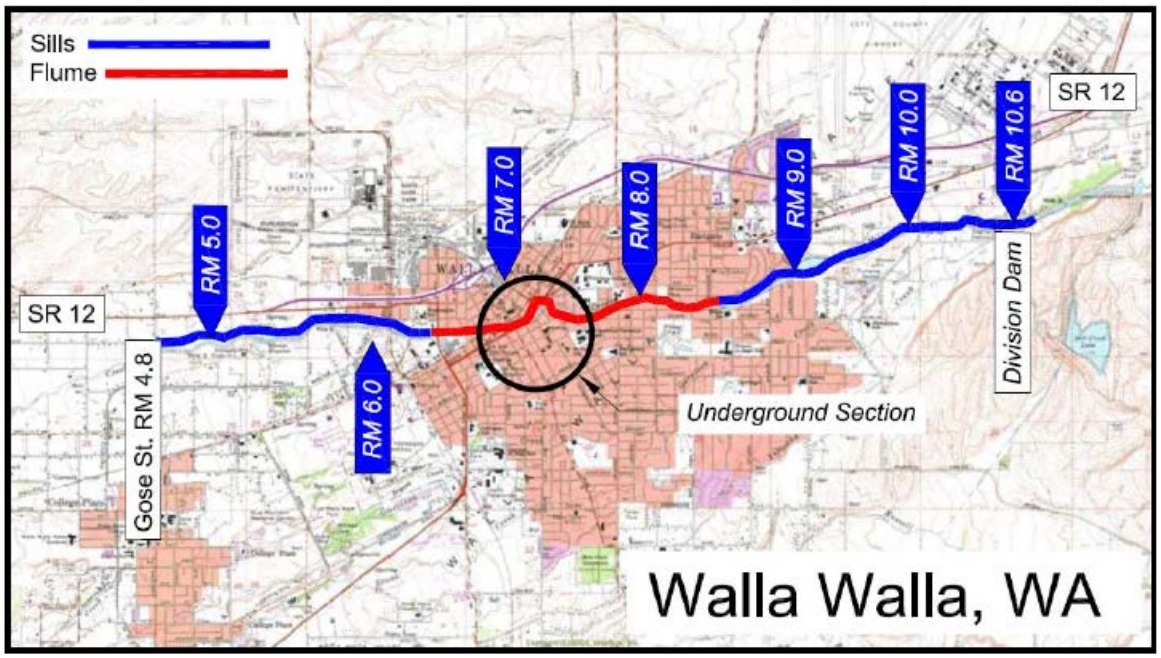

Figure 3. Project location and channel construction types (Figure provided by Tri-State Steelheaders)

Migrating summer steelhead, bull trout, and re-introduced spring Chinook salmon use the Mill Creek channel during their seasonal movements to and from their spawning and rearing areas upstream of the Diversion Dam, but the configuration of the channel can create fish passage barriers. The armored channel created a series of sills with plunge pools, and a broad, flat channel bottom between the sills (Figure 4). During high flows this design allows water to spread out, dissipating energy and causing bedload to settle out. During high flows, fish are able to pass through this portion of the channel. However, late-spring flows over the sills can be too shallow for fish to swim through. Both juvenile and adult fish can become stranded as high flows recede. Seasonal high water temperatures in the channel can kill many of these stranded fish.

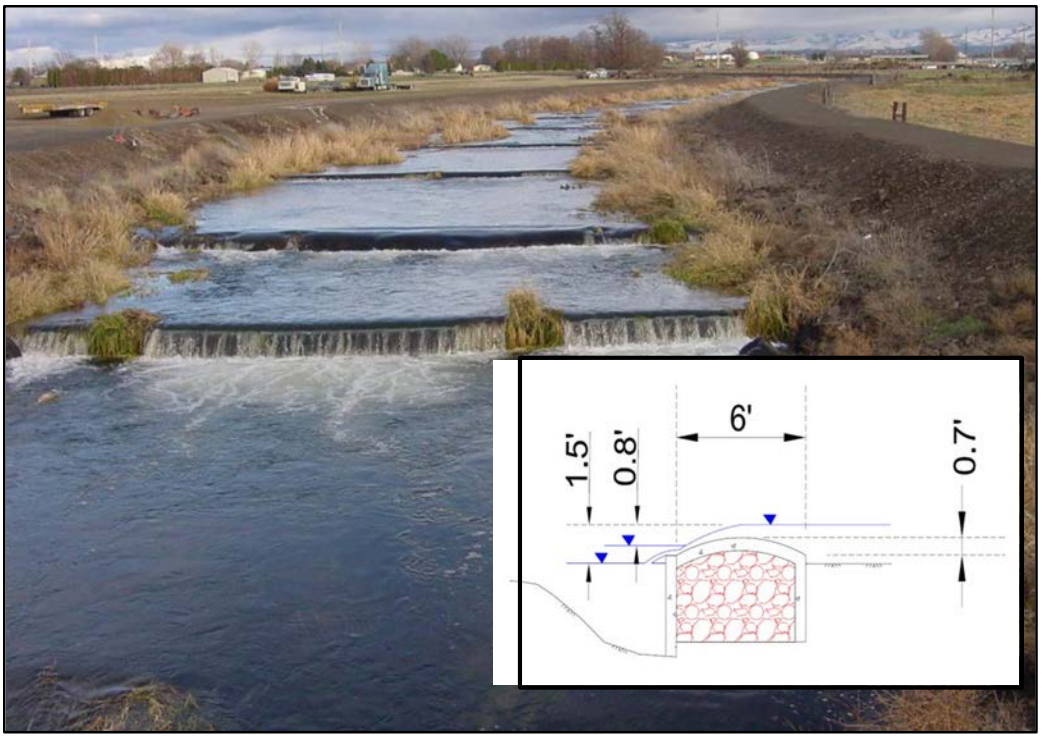

Figure 4. Reach of channel with stabilizers. Insert shows sill cross-section (Illustration provided by Tri-State Steelheaders)

The concrete-lined flume portion of the Mill Creek channel (Figure 5) can present passage barriers during low and high flows. The primary passage issues in the flume are high water velocity during high flows and a lack of resting areas. The concrete flume was designed to pass water quickly through the city. Adult fish do not have enough stamina to swim through the fast-moving water within the channel without opportunities to rest.

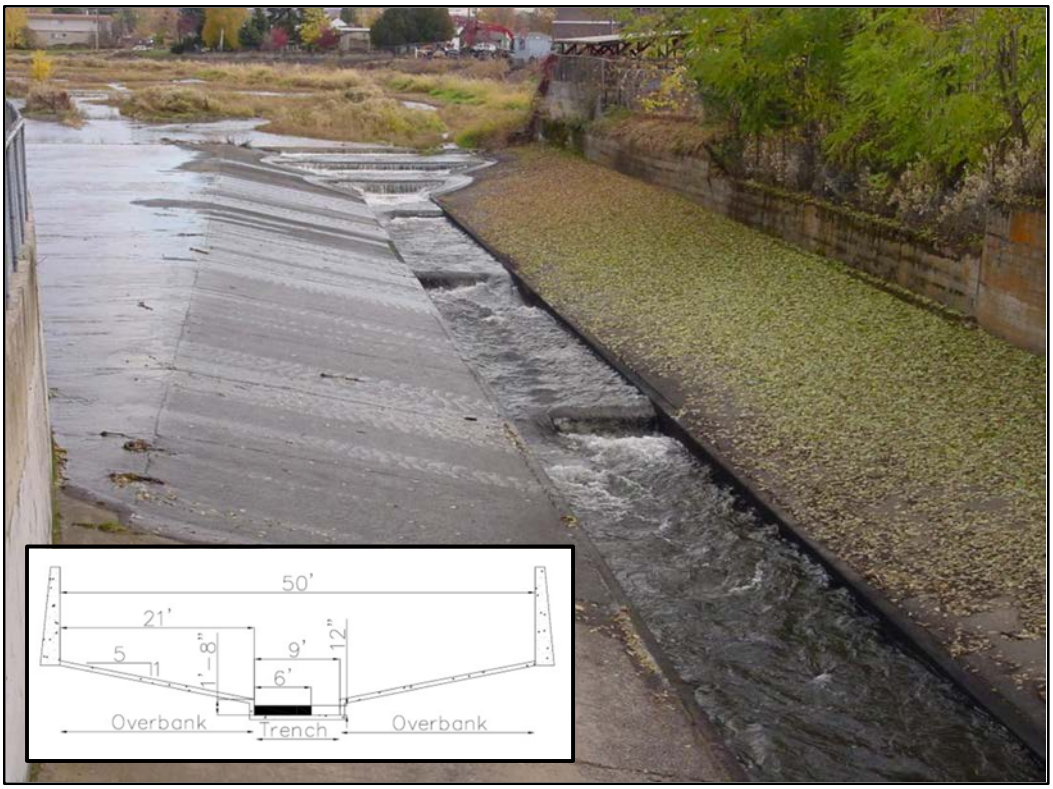

Figure 5. Concrete flume above Roosevelt Street. Insert is example cross section of the concrete flume. (Illustration provided by Tri-State Steelheaders)

Improving fish passage in the channel is intended to facilitate access to over 40 miles of habitat in Mill Creek and its tributary streams for native fish including steelhead and bull trout. Fish passage in Mill Creek is important for salmonids in the Walla Walla Basin as the Mill Creek watershed upstream of the Diversion Dam has suitable spawning and rearing habitat for Mid-Columbia steelhead. The Mill Creek bull trout population would also benefit from improved fish passage. Migratory bull trout utilize the lower reaches of the local streams and rivers during winter months and then migrate in late spring/early summer to spawn in the headwaters. The Mill Creek channel may also cause genetic isolation between Mill Creek bull trout and other populations in the Walla Walla Basin.

1.3 Authority

The authority for the Corps to grant permission for temporary or permanent alterations to a Corps-constructed harbor or river improvement (public work) constructed by the United States is found in Section 14 of the Rivers and Harbors Act of 1899 and codified in 33 USC 408. Section 408 authorizes the Secretary of the Army to grant permission for the alteration or occupation or use of a public work if the Secretary determines that the activity will not be injurious to the public interest and will not impair the usefulness of the project. A requester has the responsibility to acquire all other permissions or authorizations required by federal, state, and local laws or regulations, including any required permits from the Corps Regulatory Program (Section 10/404/103 permits). In addition, an approval under Section 408 does not grant any property rights or exclusive privileges. For Corps-constructed public works operated and

maintained by a local non-federal sponsor, the requester must either be the non-federal sponsor or have the endorsement of the non-federal sponsor prior to a written request being submitted to the Corps.

The Flood Zone District is the non-federal sponsor for the subject portion of the Mill Creek channel between the Division Works and Gose Street as they operate and maintain the subject reach of the channel. The MCWG and/or any of their member organizations (e.g. Tri-State Steelheaders) may request an alteration, but the Flood Zone District must endorse the request. Approval for any alteration, however, must be obtained from the Corps by the Flood Zone District.

2. ALTERNATIVES

2.1 No Action

Under the No Action alternative, the Corps would not grant a series of Section 408 permissions for the Flood Zone District to allow the MCWG and/or its member organizations to make alterations to the Mill Creek channel under their proposed program to improve fish passage within the six miles of channel maintained by the Flood Zone District. Native fish, including two ESA-listed species would continue to face passage barriers to and from the spawning and rearing areas upstream of the Diversion Dam. This alternative would not meet the purpose and need, but is retained as required by NEPA to set the baseline from which to compare all other alternatives.

2.2 Grant Section 408 Permissions for Fish Passage Program (Proposed Action/Requester's Preferred Alternative)

Under the proposed action, the Corps would grant a series of permissions under Section 408 for the Flood Zone District to allow the MCWG and/or its member organizations to implement their proposed fish passage improvement program. The MCWG proposes to make alterations within the entire 6-mile length of Mill Creek channel maintained by the Flood Zone District from the Division Works to the Gose Street Bridge. The modifications would be based on the results of the *Mill Creek Fish Passage Assessment* (Burns, et. al, 2009) and would be constructed in phases, depending on availability of funding. The Flood Zone District would have to submit plans for each phase to the Corps for site-specific approval prior to the MCWG and/or its member organizations starting construction of that specific phase to confirm compliance with Section 408 and EC 1165-2-216.

The Mill Creek channel consists of two basic channel types - 1) a concrete or sheetpile sills channel type with channel stabilizers which span the channel and act as weirs with plunge pools, and 2) a concrete flume channel type which generally contains a trench in the center, with alternating baffles. The *Mill Creek Fish Passage Assessment* identified 12 Reach Types (unique channel geometries) for passage analysis (Table 1), which included nine Reach Types within the concrete flume section, two fishways within the channel, and the concrete/sheetpile sills channel sections.

Table 1 – Reach type descriptions and lengths

Reach Types	**Reach Type Lengths**
Reach Type 1 – Channel Sills (263 total)	17,161 ft (3.2 miles)
Reach Type 2 – Flume Transition	325 ft
Reach Type 3 – Trapezoidal Flume	*960, 660, 360, 5160, 120* Total = 7,260 ft
Reach Type 4 – Trapezoidal Split Flume	*30, 60, 480* Total = 570 ft
Reach Type 5 – Flume Transition-Trapezoidal to Rectangular	178 ft
Reach Type 6 – Rectangular Flume	*120, 60, 180, 360* Total = 840 ft
Reach Type 7 – Rectangular Split Flume	*420, 180, 420* Total = 1,200 ft
Reach Type 8 – Rectangular Double Wall Flume	222 ft
Reach Type 9 – Flume Transition-Rectangular to Trapezoidal	117 ft
Reach Type 10 – Roosevelt St. Bridge	58 ft
Reach Type 11 – Transition Fishway	60 ft
Reach Type 12 – Division Dam and Fishway	20 ft

Three conceptual designs were developed as part of the *Mill Creek Fish Passage Assessment*. These designs were for Reach Types 1, 7, and 8. The assessment used hydraulic models and a fish energetic model to evaluate passability and the nature of barriers during the usual migration season when developing the designs. These designs are representative concepts and construction phases addressing the other reach types would modify these conceptual designs as needed to address site-specific conditions for that reach as well as incorporating information learned from the performance of the completed phases. Because flood risk management is the primary purpose of the Mill Creek Channel, design work proceeded under the caveat that any fish passage improvements could not increase flooding (increase flood stage). The design work also had to consider channel maintenance needs from the Flood Zone District, such as:

- Vehicle access must be maintained to allow the Flood Zone District to perform annual maintenance including debris and vegetation removal from the channel.
- Any passage improvements cannot reduce vertical and width clearances in the concrete channel for current Flood Zone District vehicles.
- Passage improvements cannot increase time or costs of maintenance or create new maintenance issues.

- Consider the negative impacts to flood capacity that may result from the unknown effects on the movement and deposition of bedload between sills.

Conceptual Design - Reach Type 1

This conceptual design is for Reach Type 1, the Channel Sills type. The fish passage assessment identified low flow (depth) over the sills as the passage problem. The assessment determined at flows of 100 cubic feet per second (cfs) and greater the sills are passable as the depth over each sill increases until there is no water surface drop. The assessment also determined at flows less than 100 cfs, decreasing water depth increases the difficulty for a fish to swim across the six foot wide sill crest. Three conceptual designs were developed aimed at creating a structure where depth is not limiting and where any water surface drops are 0.8 feet or less. For sills currently with drops of 0.8 feet or less, the proposed design is a slot (or notch) cut into the existing sill (See Figure 6). For sills with drops greater than 0.8 feet, a pool and weir fishway or a roughened channel would be installed into the sill (See Figure7). The fishway is designed for the sills with the greatest water surface drop. None of the conceptual designs would increase the flood stage elevation.

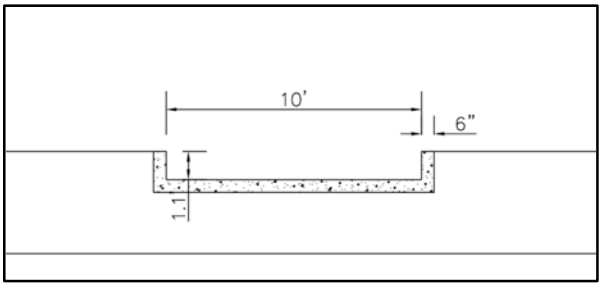

Figure 6. Slot cut into sill crest (Illustration provided by Tri-State Steelheaders)

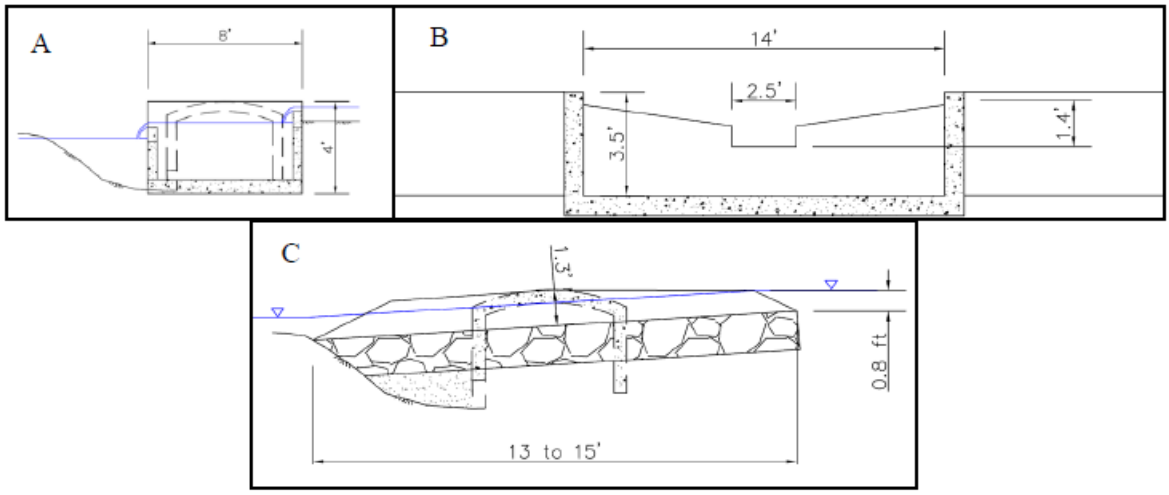

Figure 7. Pool and weir fishway profile (A), section (B, facing the sill), and roughened channel through sill (C, profile) (Illustration provided by Tri-State Steelheaders)

Construction of this passage improvement would include saw-cutting the existing concrete, using heavy equipment such as a track hoe to remove the concrete section, setting up forms, and placing concrete or large angular riprap. A temporary coffer dam and associated bypass, such as sandbags, plywood, and/or concrete blocks with a 36-inch diameter plastic pipe, would also be constructed to divert water around the construction site so all work would be done in the dry. No fresh concrete would be allowed to enter the creek. Forms would be used to contain the concrete and would remain in place until the concrete was cured. All concrete would be sufficiently cured prior to contact with water to avoid leaching.

Access would be from the levees on both sides of the creek. Equipment would be allowed to operate within the wetted perimeter as long as the drive mechanisms (wheels, tracks, tires) were outside the wetted perimeter except as needed to gain position for work. Staging areas would be in upland locations near the work site.

All material removed from the channel would be disposed of at the local landfill or other suitable location.

Conceptual Design – Reach Type 7

This conceptual design is for Reach Type 7, the Rectangular Split Flume type (Figure 8). Each of three proposed design options would modify the number and spacing of baffles to improve passage at low flow (by increasing water depth) and add resting pools or add surface roughness to create low velocity water (Figure 9):

- Design A: Shorten existing baffles by 0.2 feet and add new baffles at 20 foot spacing. Create primary resting pools spaced at 190 feet, secondary resting pools spaced every 20 feet.
- Design B: Same baffle changes as Design A. Surface roughness two inches tall added to a five foot wide area on one or both sides of the channel.
- Design C: Same baffle changes as Design A. Surface roughness six inches tall added to a ten foot wide area on one or both sides of channel (Figure 10).

Figure 8. Reach Type 7, Rectangular Split Flume (Photo provided by Tri-State Steelheaders)

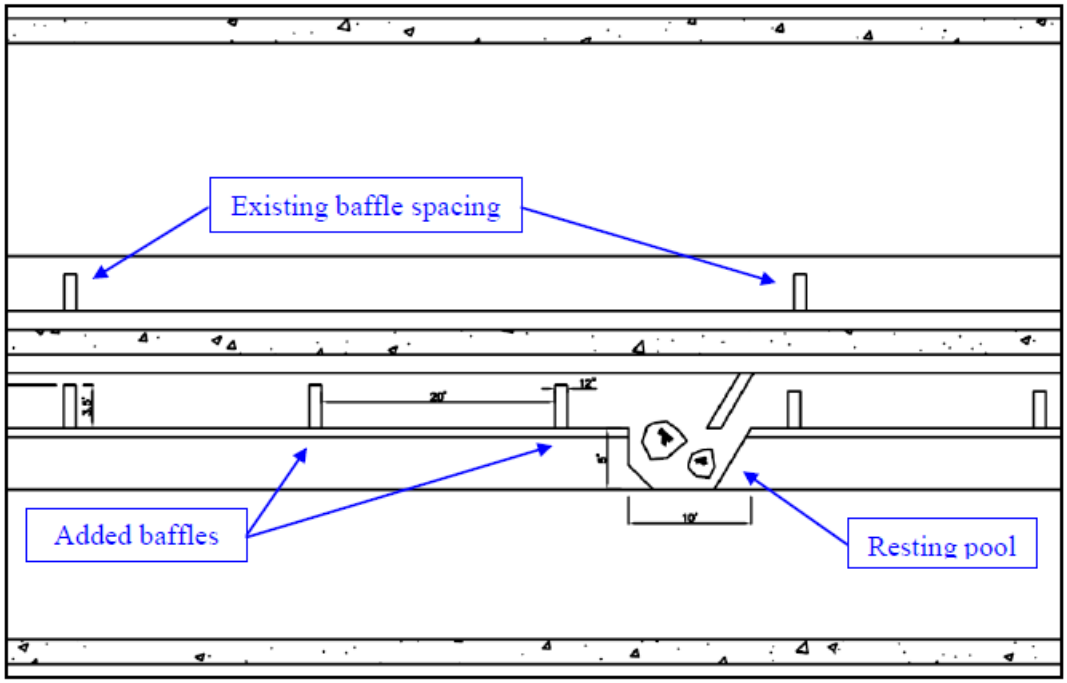

Figure 9. Examples of conceptual designs for Reach Type 7. (Illustration provided by Tri-State Steelheaders)

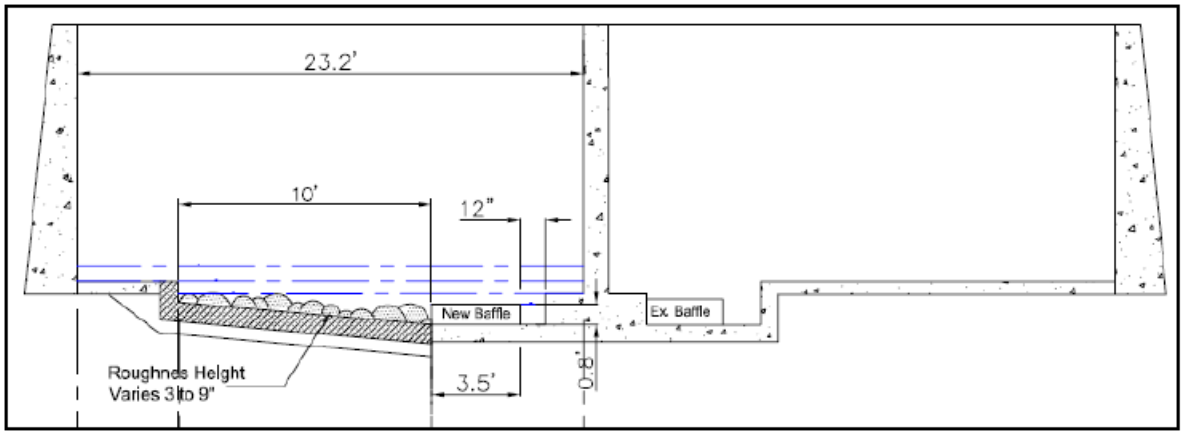

Figure 10. Example of surface roughness in Reach Type 7, Design C. (Illustration provided by Tri-State Steelheaders)

Construction of this passage concept would include saw-cutting the existing concrete floor on one side of the channel trench, using heavy equipment to remove the concrete sections, excavating the channel bottom and placing clean fill material to alter the slope, and placing pre-cast concrete roughness panels to create a continuous roughened channel on one side of the trench. Concrete curbs secured with dowels and epoxy would be used to hold the panels in place. Gaps about 12 feet long would be spaced every 80 to 100 feet in the roughened channel to provide resting pools. The concrete baffles in the trench would be removed and replaced with similar baffles, all on one side of the channel. As with the channel sills concept, a temporary coffer dam and associated bypass would be constructed to divert water around the construction site so all work would be done in the dry. Fording sites would be included in the project in order to maintain accessibility between each bank for maintenance purposes. A new wall would be placed to the outside of the channel, merging the existing concrete and the roughness panel.

Access would be through the concrete wall of the flume. A section of wall would be cut and removed. Fill material would be used to create a ramp for equipment to access the channel. Once the channel improvements for that phase were complete, the fill material would be removed and a new concrete wall section would be constructed.

Conceptual Design - Reach Type 8

This conceptual design is for Reach Type 8, the Rectangular Double Wall Flume type. Reach Type 8 is entirely underground, below the parking lot between Main and Rose Streets in downtown Walla Walla. The proposed design for Reach Type 8 is a pool and weir fishway (Figure 11). The design calls for cutting out the floor of the flume, then forming and pouring a pool and weir fishway with a 0.6 foot drop over each weir. Because this section of Mill Creek is all underground, there may be significant challenges to staging and mobilization.

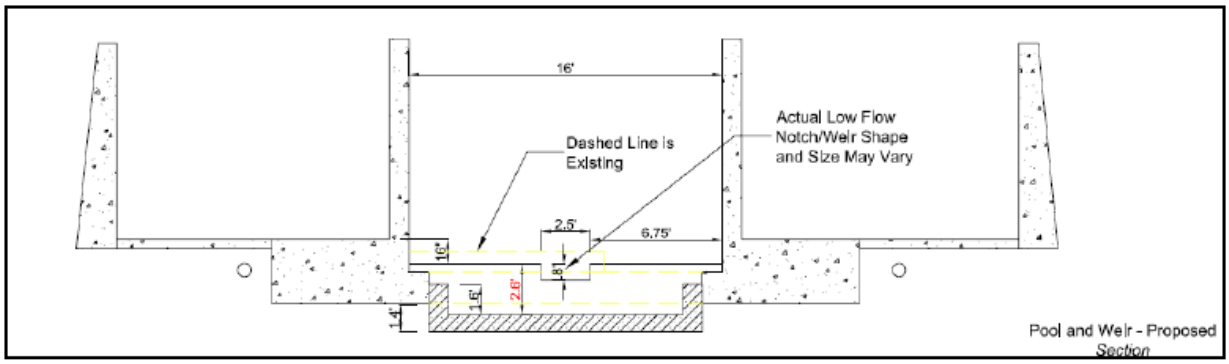

Figure 11. Reach Type 8 conceptual design (Illustration provided by Tri-State Steelheaders)

Construction of this passage improvement design would be similar to the other designs. Access would be similar to access for the Reach Type 7 concept in that a section of the concrete wall would likely need to be removed to facilitate construction of a temporary access ramp, then replaced once construction was complete. This design would also involve sawcutting concrete and placing new concrete. All concrete would need to cure prior to being exposed to creek water.

Construction of any phase would take place during the summer, between June 15 and September 30, in any year in which future phases are proposed and approved for construction by both the Flood Zone District and the Corps. This in-water work window is after any significant flows from snow melt would be expected in Mill Creek and before flows would start to rise because of fall rain. It would also be during the time when fewer fish would be in the Mill Creek channel.

The Flood Zone District would be responsible for maintenance of the passage improvements following completion of each phase of construction.

Section 408 Permission Applicability

To be considered for a Section 408 permission, any proposed site-specific alteration must comply with requirements and restrictions designed to protect the public interest and ensure the alteration would not harm the purpose of the Mill Creek channel. A checklist of these requirements is found in Appendix A. If a proposed alteration complies with these requirements, the Corps would prepare a Statement of Findings and approval letter granting Section 408 permission for that site-specific alteration.

3. AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

This section describes the environmental resource areas the Corps determined are relevant to the alternatives being considered and evaluates the effect of the alternatives on those resources. The Corps considered, but did not identify, any potential effects to terrestrial environment, noise pollution, air quality, hazardous/toxic materials, recreation, aesthetics, or socioeconomics and therefore did not address them further in this section.

3.1 Water Quality

The water quality of Mill Creek between Tausick Way and Gose Street is relatively good, but there are a few areas of concern. The largest issue occurs during the summer months when flows are low and water temperatures are high. Water temperatures often reach a daily maximum of 23.8 ºC (75 ºF) during July and August. A Total Maximum Daily Load (TMDL) for temperature was completed in 2007 and recommended maximum protection (e.g., riparian buffers with mature trees, increased flow, and narrower channels) from solar radiation as mitigation (Baldwin and Stohr, 2007). Dissolved oxygen and pH levels in the stream were also addressed in another 2007 TMDL document (Joy et al., 2007). Other TMDLs that have been completed for Mill Creek include ammonia-nitrogen (Butkus, 1993), residual chlorine (Butkus, 1997), and bacteria (Baldwin et al., 2008). Lead and gamma-bhc (Lindane) have also been identified as possible chemicals of concern based on a September 1996 sampling and modeling effort which indicated that the chronic criteria may be exceeded in the receiving waters.

3.1.1 No Action

The No Action Alternative would have no effect on water quality in Mill Creek as no construction activities for fish passage improvement would take place within the channel.

3.1.2 Grant 408 Permissions for Fish Passage Program (Proposed Action/Requester's Preferred Alternative)

Construction activities during the various phases of the proposed fish passage program would have either a short-term localized adverse effect or no effect on water quality in Mill Creek. Construction of the cofferdam and bypass may create a small turbidity plume that would not last long or extend very far. All construction would be performed in a dewatered section of the channel and would not affect water quality during the construction period. Any raw concrete placed in the channel would be contained in forms and would not be exposed to creek water until the concrete had cured. The precast roughened concrete panels would have no effect on water quality. Clean fill would be placed under the panels and would be covered by the panels and the concrete curbs used to secure the panels, thereby minimizing any turbidity that may be caused by the fill. There may be some turbidity when the cofferdam and bypass are removed and creek water is allowed to flow over the new structures. As with the initial cofferdam placement, there may be a small turbidity plume that would not last long or extend very far.

The operation of the fish passage improvement structures would have no effect on water quality.

3.2. Aquatic Environment

Current aquatic habitat within the program area is of low quality consisting of a concrete lined engineered ditch with no floodplain and concrete engineered sills. Aquatic species may drift or migrate through the project area during high flows, but during low flows areas along the sills may become impassable. Fish species found upstream and downstream of the project reach include rainbow trout/steelhead, bull trout, Chinook salmon, mountain whitefish, bridgelip

sucker, redside shiner freshwater sculpin dance, and brook lamprey. Amphibians that could be found upstream and downstream of the project reach include Pacific tree frogs, leopard frogs, and bullfrogs. Common aquatic insects in the creek are mayflies, caddisflies, dragonflies, and stoneflies. Upstream and downstream reaches of Mill Creek outside of the flood risk management channel are good fisheries habitat.

3.2.1 No Action

Under the No Action Alternative, there would be no change to the aquatic habitat. Aquatic species may drift or occasionally migrate through the Mill Creek channel to higher quality environments upstream and downstream of the channel. The Mill Creek channel would contain low habitat value to most aquatic species.

3.2.2 Grant Section 408 Permissions for Fish Passage Program (Proposed Action/Requester's Preferred Alternative)

Under the proposed fish passage program, habitat conditions would improve for aquatic species, mainly fish passage, but also for amphibians, reptiles, and microinvertebrates that may occupy the fish resting areas created by the installation of concrete pools and weir structures. These areas would be small pockets where some smaller animals may reside or periodically inhabit. Therefore, there would be a benefit to aquatic resources by the installation of the fish passage modifications.

There would be a temporary impact to aquatic resources by redirecting stream flow during low flow conditions. In-water work would occur from June 15 through September 30 of any given year, when the creek is naturally low. Construction activities may cause a short term-turbidity plume. The overall effect of the placement of the proposed structures would be a net benefit by increasing aquatic habitat for fish, amphibians, reptiles, and microinvertebrates that otherwise may infrequently pass through the Mill Creek channel from upstream and downstream reaches.

3.3 Threatened and Endangered Species

Two species listed as threatened or endangered under the Endangered Species Act (ESA) are found in the area that would be affected by the program. These species are Mid-Columbia River steelhead and bull trout.

Mid-Columbia River (MCR) steelhead were first listed as threatened March 25, 1999 (64 FR 14517) and reaffirmed as threatened on January 5, 2006 (71 FR 834) and April 14, 2014 (75 FR 20802. Protective regulations were issued on June 28, 2015 (70 FR 37160) and critical habitat for this Distinct Population Segment (DPS) was listed on September 5, 2005 (70 FR 52630). The MCR steelhead DPS does not include the resident form (rainbow trout), which co-occur with these steelhead. Mid-Columbia River steelhead utilize the project area for migration habitat. No spawning occurs within this section of Mill Creek. In 2009, the U.S. Fish and Wildlife Service (USFWS) performed snorkel surveys of Mill Creek upstream of the Division Works (Gallion and Anglin, 2009). The estimated minimum salmonid abundance between the

Diversion Dam and the Division Works was estimated to be 410, 537 and 407 fish during June, July and August respectively. At the Diversion Dam, the number of steelhead are counted by the Corps. Estimates are around 50 individuals per year.

Bull Trout were listed as threatened on June 10, 1998 (63 FR 31647). Critical habitat for bull trout was designated on September 30, 2010. In the Columbia River Basin, bull trout historically were found in about 60% of the basin. They now occur in less than half their historic range. Populations remain in portions of Oregon, Washington, Idaho, Montana, and Nevada. The Walla Walla Basin is comprised of five local bull trout populations within two core areas. Two local populations are located in the Walla Walla River Subbasin (Walla Walla River Core Area). Each local population in the Walla Walla Basin has a resident and migratory fluvial component (Anglin et al., 2012). Fluvial populations migrate to larger streams after a few years in their natal stream. Resident bull trout spend their entire lives in or near the stream where they hatched. The Corps conducts video monitoring at both of its fish ladders on Mill Creek, as well as at the entrance to Yellowhawk Creek at the First Division Works. The USFWS conducts Passive Integrated Transponder (PIT) tag monitoring (now conducted by the Confederated Tribes of the Umatilla Indian Reservation) at both fish ladders, the low-flow outlet, and on Yellowhawk Creek between the First and Second Division Works. Only a few bull trout are observed passing upstream past the cameras each year. Many bull trout are detected by the PIT tag monitoring system.

3.3.1 No Action

Under the No Action Alternative, there would be no change to the fish passage along Mill Creek. Migrating summer steelhead, spring Chinook salmon, and bull trout would continue to use the Mill Creek channel during high flows for their seasonal movements to and from their spawning and rearing areas upstream of the Diversion Dam, but would be unable to pass the channel during low flow events. The downstream fish population would continue to be genetically isolated from the upper Walla Walla watershed. Recovery of the Mid-Columbia steelhead and bull trout would continue to be an ongoing challenge, since a critical impact to these two species is the ability of the fish to migrate to vital spawning and rearing habitat upstream of the Mill Creek channel reach.

3.3.2 Grant Section 408 Permissions for Fish Passage Program (Proposed Action/Requester's Preferred Alternative)

Under the proposed fish passage program, fish passage would improve for over 40 miles of Mill Creek and tributary stream habitat used by native fish and ESA-listed steelhead and bull trout. The benefits to native fish could be substantial as the Mill Creek watershed upstream of Diversion Dam has important spawning and rearing habitat for Mid-Columbia steelhead and re-introduced spring Chinook. The Mill Creek bull trout population would also benefit from improved fish passage. Migratory bull trout utilize the lower reaches of the local streams and rivers during winter months and then migrate in late spring/early summer to spawn in the headwaters.

To minimize the adverse effect to bull trout and steelhead during construction, work would occur between June 15 and September 30 in any given year when flows are low and fish are less likely to be in the channel. Construction activities may cause a short term-turbidity plume. The channel would be blocked upstream using energy blocks, plywood, or other materials to create a cofferdam around the disturbance area to contain debris and dewater the work site. The flow would be directed into a bypass, most likely by using a 36-inch diameter pipe extending downstream to isolate the work area. Any raw concrete placed in the channel would be contained in forms and would not be exposed to creek water until the concrete had cured, thereby reducing any effect the concrete might have on water quality and ESA-listed fish. The precast roughened concrete panels would be secured and epoxied into the channel and the epoxy would be allowed to set before being exposed to creek water. Staging areas would be in upland areas located adjacent to the work site. Once construction of a phase was completed, the cofferdam and bypass would be deconstructed in steps to avoid flushing flows at the site.

3.4 Cultural Resources

Three separate National Register of Historic Places (NRHP) eligibility assessments of the Mill Creek Flood Zone Project have been made in the past decade. As part of a Cultural Resources Inventory of the Division Street Bridge Replacement Project in Walla Walla, carried out in November, 2004, Fennelle Miller found the channel section eligible for the NRHP under Criterion A, for its association with events that have made significant contribution to the broad patterns of our history; and Criterion C, for its embodying of the distinctive characteristics of a period architecture, landscape, or engineering. Miller cited the role of the Works Progress Administration (WPA) and the Army Corps of Engineers as the primary contributors to the channel's historic character (Miller 2005).

Based on Miller's recommendation, the Department of Archaeology and Historic Preservation (DAHP) determined the channel elements described in Miller's Historic Property Inventory Report (HPIR) were eligible for the National Register in March, 2005. This determination was augmented by another HPIR submitted by Jill Dowling in May 2008. Dowling focused on the concrete section of the channel that passed through downtown Walla Walla, also making a case for eligibility under Criterion A, as a historically significant example of community planning and development, and Criterion C, for its architecture and engineering (Dowling 2008).

The most thorough evaluation of the flood-control project eligibility as a whole was performed by Lauren McCroskey, a historic preservation specialist with the Corps. McCroskey described the report's purpose as anticipating "immediate and future construction projects that may affect the qualities that make the property eligible for listing in the National Register of Historic Places" (McCroskey 2009: 1). She identified nine project components and structures that were considered significant contributing members of the Mill Creek Flood Control Project, including the Mill Creek Control Channel (1935), Diversion Levee (1944), Virgil B. Bennington Lake (1944), Mill Creek Dam (1944), Division Works (1939), Headworks and Canal (circa 1944), Russell Creek Auxiliary Outlet Canal (1944), Mill Creek Return Canal (circa 1944), and Mill Creek Project Operator's House and Garage (circa 1944).

The report determined that "the period of significance that best defines the project inception and historical operation falls from 1935 when the Mill Creek channel was first improved, to 1951 when most of the major repairs and retrofitting of Project components had been completed" (McCroskey 2009: 1).

McCroskey described the character-defining features of the project in terms of flood risk management engineering. The Mill Creek Flood Control Project was a "singular example of its type," incorporating "full loop" cycling of floodwaters, a diversity of operational control elements, and "almost every component of flood control management." In recommending the project as eligible for inclusion in the NRHP under Criteria A and C, McCroskey emphasized the project's sophisticated design concepts and mechanisms that were "the most sophisticated then available to engineers and governmental officials," and "the critical role played by Depression era make work projects under such programs as the WPA" (McCroskey 2009: 13-14).

3.4.1 No Action

The No Action Alternative would have no effect to cultural resources as there would be no change to the Mill Creek channel to improve fish passage.

3.4.2 Grant Section 408 Permissions for Fish Passage Program (Proposed Action/Requester's Preferred Alternative)

The Mill Creek Fish Passage Project would not have an adverse effect on the character-defining features of the NRHP eligible Mill Creek Channel for the following reasons:

1. Fish passage does not currently constitute one of the historically significant characteristics of the Mill Creek Channel. To date, the primary features cited for the Channel's eligibility status relate to its association with the WPA and the Corps and the engineering diversity of its flood-control elements. Because the existing fish-passage elements are not part of current concurred-upon eligibility determinations, modifications to those elements do not constitute an adverse effect.

2. The proposed modifications would not have an adverse effect on historically significant flood risk management elements. Both the Corps and the Flood Zone District require that modifications to the Channel may not impair its flood mitigation performance in any way. Designing within this framework, the Mill Creek Fish Passage Project does not greatly alter existing design elements; rather, it proposes more baffles, a deeper flume, and roughened channel surfaces.

Only two proposed modifications, notches in the concrete stabilizer crests and the fish weir and plunging pools in the concrete flume channels, constitute new design elements. The concrete crests were not part of the original design, but were added in 1951 to improve durability and stabilizer performance. The proposed notches in the concrete crests, to improve fish passage in periods of low flow, do not change the function of the stabilizers, but add a new "use." Similarly, the weirs, plunge pools, and other resting elements, such as boulders, would increase the physical

presence of fish-passage elements that reflect the more recent focus on protecting fish runs in river engineering.

3.5 Climate Change

Climate change refers to long-term changes in temperature, precipitation, wind, and other elements of the earth's climate. However, evidence suggests that changes in climate are currently being accelerated by human-caused greenhouse gas (GHG) emissions, primarily carbon dioxide (CO2) (USFS 2009). Many climate models predict a trend of warmer, dryer conditions in the inland Pacific Northwest and northern Rocky Mountains as a result of climate change. The Columbia River basin, which includes Mill Creek, is predicted to experience a shift as to when and in what form precipitation occurs with resulting effects on stream flows.

Collaborative research and analysis by the agencies responsible for managing water resources in the Columbia River basin estimates a future shift in flow regimes to lower summer flows and higher high flows occurring earlier in the year than have historically occurred (Reclamation et al 2011). These studies predict that air temperatures are likely to increase by 2 to 5 degrees Fahrenheit by 2059. Predicted changes in annual precipitation are expected to change slightly; however, models predict that there are likely to be notable shifts in when precipitation occurs and what form it takes (e.g., more rain and less snow). Models indicate more winter precipitation would fall as rain than presently occurs, producing more runoff earlier in the winter and spring and less in the summer months. The River Management Joint Operating Committee's summary report (Reclamation et al 2011) notes that, because of the uncertainties associated with climate change analysis, the full extent of potential effects of climate change on the Columbia River system requires further analysis.

Potential long-term effects of climate change on the Columbia River basin that were identified include:

- Increased winter/early spring runoff and decreased summer runoff may result in irrigation water supply reductions, increased flood risk in winter/early spring, and decreased hydropower generation in summer.
- Warmer conditions may increase stress on fisheries and aquatic environments.
- Increased plant growth induced by increased precipitation as rain, combined with warmer, drier summers, may increase forest fire risk. (Reclamation 2011)

The *Third National Climate Change Assessment* (Mote, P.A. et. al, 2014) includes information on climate change in the Northwest. Key findings presented in that document include:

- Changes in timing of streamflow related to snowmelt will continue, with peak flows occurring earlier in the year.
- Hydrologic responses to climate change will depend on the dominant form of precipitation within a particular watershed. Watersheds with mixed precipitation are likely to see less variation from historic patterns of flow conditions than those dominated by snowmelt.
- Summer flows for snowmelt-driven watersheds are predicted to be substantially reduced when compared to historic levels. Modeling studies indicate that these conditions would "…with near 100 percent likelihood…" occur by 2050.

3.5.1 No Action

The No Action Alternative would have no effect on climate change. Any GHG emissions from the ongoing operation of equipment during channel maintenance activities would be temporary and of low quantities, falling well short of the annual emissions thresholds in the Environmental Protection Agency's (EPA's) GHG reporting rule.

Mill Creek is a snowmelt- and mixed precipitation-driven watershed and may experience a combination of predicted effects from climate change with respect to shifts in streamflow timing and reduced summer flows. In general, changes in the timing and magnitude of high- and low-flow periods could adversely affect the life cycles of salmonids, including disruptions to overwintering juvenile fish and incubating eggs in streambeds (Bisson 2008). Migrating fish in Mill Creek would continue to experience passage difficulties in the Mill Creek channel. If the already low summer flows are reduced even further by climate change, fish stranding between sills could be a larger problem than exists currently.

3.5.2 Grant Section 408 Permissions for Fish Passage Program (Proposed Action/Requester's Preferred Alternative)

The proposed fish passage program would have no effect on climate change. Any GHG emissions from the operation of construction equipment would be temporary and of low quantities, falling well short of the annual emissions thresholds in EPA's GHG reporting rule.

Climate change would have the same effect under the proposed fish passage program as under the No Action Alternative. However, channel modifications made under the proposed fish passage program would improve the ability of fish to migrate through the Mill Creek channel during any altered flow conditions caused by climate change and to access cooler water at higher elevations in the Mill Creek basin.

3.6 Cumulative Effects

3.6.1 Introduction

The National Environmental Policy Act (NEPA) and the Council on Environmental Quality (CEQ) regulations implementing the Act require federal agencies to consider the cumulative effects of their actions. Cumulative effects are defined as effects "on the environment which result from incremental impact of an action when added to other past, present and reasonably foreseeable future actions regardless of what agency (federal or non-federal) or person undertakes such other actions. Cumulative impacts can result from individually minor, but collectively significant actions taking place over a period of time" (40 CFR § 1508.7).

The primary goal of a cumulative effects analysis is to determine the magnitude and significance of the environmental consequences of the proposed action in the context of the cumulative effects of other past, present, and reasonably foreseeable future actions.

The Corps used the technical analysis conducted in this EA to identify and focus on cumulative effects that are "truly meaningful" in terms of local and regional importance. While the EA addresses the effects of alternatives on the range of resources representative of the human and natural environment, not all of those resources need to be included in the cumulative effects analysis – just those that are relevant to the decision to be made on the proposed action. The Corps has identified threatened and endangered fish species as the only resource that is notable for its importance to the area and potential for cumulative effects.

3.6.2 Geographic and Temporal Scope of Cumulative Effects Analysis

Guidance for setting appropriate boundaries for a cumulative effect analysis is available from CEQ (1997) and EPA (1999). Generally, the scope of cumulative effects analysis should be broader than the scope of analysis used in assessing direct or indirect effects. "Geographic boundaries and time periods used in cumulative impact analysis should be based on all resources of concern and all of the actions that may contribute, along with the project effects, to cumulative impacts" (EPA 1999). The analysis should delineate appropriate geographic areas including natural ecological boundaries, whenever possible, and should evaluate the time period of the project's effects.

The geographic boundary for the cumulative effects analysis for threatened and endangered fish includes actions taking place in the Walla Walla River watershed. The timeframe of 75 years was identified based on an approximate construction start of the Mill Creek Flood Control Project in the 1940's. A timeframe of five years into the future has been considered. Only actions that are reasonably foreseeable are included. To be reasonably foreseeable, there must be a strong indication that an action/event will occur or be conducted.

3.6.3 Past Actions

Since 1918, the City of Walla Walla and the U.S. Forest Service have managed the upper Mill Creek watershed solely for the protection of water quality as the City of Walla Walla receive 90 percent of its municipal water supply from the watershed. Access to this area is well controlled and therefore, remains pristine. Mill Creek flow is reduced by about 37 cfs due to these water withdrawals. When Mill Creek flows are very low during summer or when water quality is poor, the supply is supplemented by wells. Structures and trails associated with the watershed water supply were constructed many years prior to the 75 year temporal boundary established for this analysis.

In the1930s after enduring several large floods, the people of Walla Walla, led by Virgil B. Bennington, started a petition for federal funding to build flood control structures in Mill Creek. Following approval by Congress, President Roosevelt signed the Flood Control Act of 1938 in June of that year. The Act called for two projects to be built in the Walla Walla Valley: the Mill Creek Project and the Mill Creek Channel. By 1948, both projects were completed by the Corps. Some provisions for fish passage were included in the form of baffles, weirs, and fishways. On February 25, 1974, the Mill Creek Flood Control District was dissolved and the Mill Creek Flood Control Zone District was organized. The Mill Creek channel is inspected annually by the Corps to identify issues that need to be corrected.

Several attempts have been made to improve fish passage conditions in the Mill Creek for fish that are now listed under ESA. In the 1980's, the Corps constructed fish ladders at the Division Works and the Diversion Dam. Also during that time the Corps created fish resting areas by placing large rocks in the center of the creek downstream of the Diversion Dam. More recently, members of the MCWG placed sandbags on the some of the concrete sills to temporarily concentrate low flows to facilitate fish passage. In 2012, the Corps constructed prototype concrete-lined notches in three of the concrete sills upstream of the Division Works to facilitate fish passage during low flow. As of 2014, the MCWG has completed two phases of their Mill Creek fish passage improvement program, modifying four locations.

Effects of Past Actions on Threatened and Endangered Fish

Although fishways were constructed at various locations, the concrete Mill Creek channel serves as a low quality channel for fish passage, specifically bull trout, steelhead, and Chinook salmon. During high flow conditions, fish are able to migrate through the Mill Creek channel; however this channel is impassable during low flow conditions.

3.6.4 Present Actions

According to local fisheries biologists, Mill Creek is the key to summer steelhead restoration in the Walla Walla Basin. In 2005 there were five significant barriers on Mill Creek: (1) Stiller diversion (removed in 2007), 2) Gose Street Bridge (fish ladder completed in 2008), 3) the City of Walla Walla Flood Control Channel (the Mill Creek channel), 4) the Bennington Lake Diversion, and 5) the dam at Kooskooskie (removed in 2007). The Walla Walla County Conservation District and others removed the problems at Stillers (lift pump station) and at Kooskooskie (dam removal).

Bonneville Power Administration has granted funding towards several of these projects including the Gose Street fish ladder and the two previous phases of the MCWG fish passage improvement program in the Mill Creek channel.

Effects of Present Actions on Threatened and Endangered Fish

Projects in the Mill Creek watershed are being completed as funding is secured. Projects are being constructed by various groups including the Tri-State Steelheaders, the Confederated Tribes of the Umatilla Indian Reservation, and Walla Walla Conservation District.

3.6.5 Future Actions

The ultimate objective of these fish passage actions is to improve fish passage conditions for Mill Creek by removing these barriers. The goal is to improve access to potential spawning and rearing habitat for summer steelhead and spring Chinook. Bull trout spawn further up in the Mill Creek watershed with larger adfluvial adults moving downstream to feed only during the winter months. The value to bull trout from continuing to implement the MCWG's program is two-fold 1) it would allow adfluvial bull trout to access winter feeding areas in the Walla Walla

River, and 2) it would allow genetic material to be exchanged between the Mill Creek population and other populations downstream.

Since projects would be completed as funding is secured, it is difficult to assess the future benefits to the protected fish. As fish passage is improved, it would be expected that bull trout, steelhead, and Chinook salmon populations would rebound as they are capable of utilizing the Walla Walla river headwaters as their spawning grounds. However, there are multiple factors that drive fish populations. Currently, improving fish passage is identified as one of the key components that would lead to overall success in restoring these protected species populations and ultimately delisting these species from their protection under the Endangered Species Act. Therefore, the net benefit would be beneficial to the future outlook of these protected species.

4. ENVIRONMENTAL REVIEW REQUIREMENTS

4.1 Federal Statutes

4.1.1 Clean Air Act

Activities performed under the Mill Creek Fish Passage Project would have a de minimis effect on air quality. The proposed actions would be in compliance with the Clean Air Act. Pursuant to Section 176(C) and 309 of the Act, this environmental assessment would be provided to the EPA.

4.1.2 Clean Water Act

Discharge of fill material below the line of ordinary high water in the waterway requires evaluation under Section 404 of the Clean Water Act. The MCWG, through the Tri-State Steelheaders, has been requesting a Department of the Army Permit from the Corps under Section 404 for the previous phases of this program. The Corps has been issuing a letter to the Tri-State Steelheaders stating the proposed activities are authorized by Nationwide Permit (NWP) 27, Aquatic Habitat Restoration, Establishment, and Enhancement Activities. The MCWG and/or its member organizations would continue to request a Section 404 permit from the Corps each time a phase is proposed for Section 408 permission.

4.1.3 Comprehensive Environmental Response, Compensation and liability Act of 1980 and 2006

The proposed action is not known to involve lands contaminated with hazardous substances. Environmental compliance would be performed, if necessary, to determine liability and remediation.

4.1.4 Endangered Species Act (ESA)

The Corps Seattle District Regulatory office has obtained a joint programmatic biological opinion from the USFWS and National Marine Fisheries Service (NMFS) for Washington State Fish Passage and Habitat Enhancement Restoration (FWS No. 13410-2008-FWS # F-0209 and

NMFS Tracking No.: 2008/03598) (Appendix B). This consultation is for actions authorized under NWP 27. The Services have concluded that fish passage/habitat improvement projects undergoing Seattle District Regulatory office review are not likely to jeopardize the continued existence of the bull trout and Mid-Columbia River steelhead. Approval under the Section 408 permissions would be conditioned on the need for the MCWG and/or its member organizations to receive a Corps Regulatory permit (i.e. NWP 27 letter of permission) prior to initiation of construction activities and to comply with the conditions in the programmatic biological opinion.

The Walla Walla District wildlife biologist has reviewed the biological opinion and coordinated with the Services and the Seattle District Regulatory office and concurs that the MCWG fish passage program is consistent with the biological opinion.

4.1.5 Magnuson-Stevens Fishery Conservation and Management Act

The proposed action would not adversely affect Essential Fish Habitat.

4.1.6 National Environmental Policy Act (NEPA)

This Environmental Assessment is being prepared and circulated to agencies and the public for review and comment pursuant to the requirements of the National Environmental Policy Act (NEPA). Full compliance with NEPA will be achieved when the final Finding of No Significant Impact (FONSI) is signed, if one is determined to be appropriate, or an EIS is prepared.

This EA addresses overall effects of granting a series of Section 408 permissions for the MCWG to implement its fish passage program and the types of effects expected as each phase under it is constructed. The Corps would review the plans for each future phase. If the plans are consistent with the types of construction addressed in the EA and would have environmental effects similar to those described in the EA, no additional review under NEPA would be needed.

4.1.7 National Historic Preservation Act (NHPA)

The Bonneville Power Administration (BPA) has determined the Mill Creek Fish Passage Project would result in “no adverse effect” to historic properties. This is based on a cultural resources survey report prepared by Michael Falkner, Matthew Sneddon, and Todd Ahlman, entitled, ***Cultural Resources Field Survey for the 2011 BPA Funded Mill Creek Fish Passage Project, Walla Walla County, Washington***, dated May 2011. BPA provided funding for some of the earlier phases of the MCWG program and was the lead Federal agency for NHPA Section 106 compliance. The Section 106 compliance was completed for the entire 6-mile length of Flood Zone District-managed channel in anticipation of out-year phases. BPA received concurrence with its determination from the Washington State Historic Preservation Officer on June 14, 2011 (Appendix C). The Walla Walla District Supervisory Archaeologist has reviewed BPA's Section 106 compliance and finding of "no adverse effect," and concurred with that finding.

BPA also agreed in the unlikely event cultural or historic material is discovered during project implementation, an archaeologist will be notified immediately and work halted in the vicinity of the findings until they can be inspected and assessed.

4.1.8 Noise Control Act

The federal action would not result in noise emissions greater than the applicable legal limits.

4.1.9 Resource Conservation and Recovery Act

The propose action may involve hazardous wastes or used oil regulated by this Act and any required environmental compliance would be performed to properly dispose of all hazardous waste.

4.1.10 Rivers and Harbors Act of 1899, Section 10

The action is authorized under Nationwide Permit 27, Aquatic Habitat Restoration, Establishment, and Enhancement Activities.

4.1.11 Toxic Substances Control Act

The proposed action would not involve production, importation, use, and disposal of polychlorinated biphenyls (PCB's), asbestos, radon, or lead-based paint.

4.2 Executive Orders

4.2.1 Executive Order 11988, Flood Plain Management, May 24, 1977

This program would not change the flood plain nor encourage development within the floodplain.

4.2.2 Executive Order 11990, Protection of Wetlands, May 24, 1996

This program would not adversely affect any wetlands.

4.2.3 Executive Order 12898, Environmental Justice, February 11, 1994

The proposed action would not adversely or disproportionately affect minority or low income populations.

4.3 Executive Memorandums

4.3.1 CEQ Memorandum, August 10, 1980, Interagency Consultation to Avoid or Mitigate Adverse Effect on Rivers in the Nationwide Inventory

This segment of Mill Creek is not included in the inventory of wild and scenic rivers.

4.4 State Permits

4.4.1 Hydraulic Project Approval (HPA)

Although not a federal requirement, the MCWG or its member organizations would need to obtain an HPA from WDFW prior to constructing phases of the program.

5. CONSULTATION AND COORDINATION

The Corps is distributing this draft EA and draft FONSI for a 15-day public and agency review and comment. It is also available through the Walla Walla District Corps of Engineers website at www.nww.usace.army.mil/Missions/EnvironmentalCompliance.aspx. The distribution list includes the following:

Federal Agencies
U.S. Fish and Wildlife Service
National Marine Fisheries Service
Environmental Protection Agency

Washington State Agencies
Washington Department of Fish and Wildlife
Washington Department of Ecology
Washington Department of Archaeology and Historic Preservation

Local Governments
City of Walla Walla
Walla Walla County Public Works Department
City of College Place
Walla Walla County Planning Department
Mill Creek Flood Control Zone District

Tribes
Confederated Tribes of the Umatilla Indian Reservation

Other
Tri-State Steelheaders
Walla Walla 2020
Blue Mountain Audubon Society
Walla Walla Watershed Partnership

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