

YAKIMA RIVER BASIN  
ECOSYSTEM RESTORATION  
YAKIMA COUNTY, WASHINGTON

---

**APPENDIX D**

**Environmental Compliance Documentation**

June 2018

**Integrated Feasibility Report and  
Environmental Assessment**



US Army Corps  
of Engineers®  
Seattle District





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

July 13, 2017

Refer to NMFS Nos:  
WCR-2017-6789

Melissa Leslie  
Section Chief, Watershed and Terrestrial Resources  
Corps of Engineers  
P. O. Box 3755  
Seattle, WA 98124-3755

Re: Endangered Species Act Section 7(a)(2) Biological Opinion, and Magnuson-Stevens Fishery Conservation and Management Act Essential Fish Habitat Response for the Yakima River Gap to Gap Ecosystem Restoration Project, Yakima County, Washington (Sixth Field Hydrologic Unit Code: 170300030206 City of Yakima-Yakima River)

Dear Ms. Leslie:

Thank you for your email of April 10, 2017, requesting initiation of consultation with NOAA's National Marine Fisheries Service (NMFS) pursuant to section 7 of the Endangered Species Act of 1973 (ESA) (16 U.S.C. 1531 et seq.) for ecosystem restoration on the Yakima River.

We also reviewed the likely effects of the proposed action on essential fish habitat, pursuant to section 305(b) of the Magnuson-Stevens Fishery Conservation and Management Act (16 U.S.C. 1855(b)), and concluded that the action would adversely affect the EFH of Pacific Coast salmon. Therefore, we have included the results of that review in Section 3 of this document.

In the biological opinion (Opinion), NMFS concludes that the proposed action is not likely to jeopardize the continued existence of ESA-listed Middle Columbia River (MCR) steelhead (*Oncorhynchus mykiss*). NMFS also determined the action will not destroy or adversely modify designated critical habitat for MCR steelhead. Rationale for our conclusions is provided in the attached Opinion.

As required by section 7 of the ESA, NMFS provided an incidental take statement (ITS) with the Opinion. The ITS describes reasonable and prudent measures (RPMs) NMFS considers necessary or appropriate to minimize incidental take associated with the proposed action. The take statement sets forth nondiscretionary terms and conditions, including reporting requirements that the Corps and any person who performs the action must comply with to carry out the RPMs.

Incidental take from the proposed action that meets these terms and conditions will be exempt from the ESA take prohibition.

Our EFH analysis includes two conservation recommendations to avoid, minimize, or otherwise offset potential adverse effects to EFH. If your response is inconsistent with the EFH conservation recommendations, the Corps must explain why, including the justification for any disagreements over the effects of the action and the recommendations. In response to increased oversight of overall EFH program effectiveness by the Office of Management and Budget, NMFS established a quarterly reporting requirement to determine how many conservation recommendations are provided as part of each EFH consultation and how many are adopted by the action agency. Therefore, in your statutory reply to the EFH portion of this consultation, we ask that you clearly identify the number of conservation recommendations accepted.

Please contact Jody Walters of the Columbia Basin Branch at (509) 962-8911 ext. 803, [jody.walters@noaa.gov](mailto:jody.walters@noaa.gov) if you have any questions concerning this consultation, or if you require additional information.

Sincerely,



for Barry A. Thom  
Regional Administrator

Enclosure

cc: [File]  
Eric Bartrand, WDFW

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

**Yakima River Gap to Gap Ecosystem Restoration Project**

NMFS Consultation Number: WCR-2017-6789

Action Agency: U. S. Army Corps of Engineers

Affected Species and NMFS' Determinations:

ESA-Listed Species	Status	Is Action Likely to Adversely Affect Species?	Is Action Likely To Jeopardize the Species?	Is Action Likely to Adversely Affect Critical Habitat?	Is Action Likely To Destroy or Adversely Modify Critical Habitat?
Middle Columbia River steelhead ( <i>O. mykiss</i> )	Threatened	Yes	No	Yes	No

Fishery Management Plan That Identifies EFH in the Project Area	Does Action Have an Adverse Effect on EFH?	Are EFH Conservation Recommendations Provided?
Pacific Coast Salmon	Yes	Yes

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

**Issued By:**

*Barry A. Thom*  
Barry A. Thom  
Regional Administrator

**Date:** 07/13/2017

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## ACRONYM GLOSSARY

BA	Biological Assessment
CFR	Code of Federal Regulations
Corps	Corps of Engineers
DPS	Distinct Population Segment
DQA	Data Quality Act
EFH	Essential Fish Habitat
ESA	Endangered Species Act
ESU	Evolutionarily Significant Unit
FR	Federal Register
ICTRT	Interior Columbia Basin Technical Recovery Team
ISAB	Independent Scientific Advisory Board
ITS	Incidental Take Statement
MCR	Middle Columbia River
MPG	Major Population Group
MSA	Magnuson-Stevens Fishery Conservation and Management Act
NLAA	Not Likely to Adversely Affect
NMFS	National Marine Fisheries Service
NTU	Nephelometric Turbidity Units
NWFSC	Northwest Fisheries Science Center
OMB	Office of Management and Budget
Opinion	Biological Opinion
PBF	Physical and Biological Feature
PCE	Primary Constituent Element
PFMC	Pacific Fishery Management Council
RM	River Mile
RPM	Reasonable and Prudent Measure
sq ft	Square Feet
SR	State Route
U.S.C.	United States Code
USGCRP	U.S. Global Change Research Program
VSP	Viable Salmonid Population

## **1. INTRODUCTION**

This Introduction section provides information relevant to the other sections of this document and is incorporated by reference into Sections 2 and 3 below.

### **1.1 Background**

National Marine Fisheries Service (NMFS) prepared the biological opinion (Opinion) and incidental take statement (ITS) portions of this document in accordance with section 7(b) of the Endangered Species Act (ESA) of 1973 (16 U.S.C. 1531 et seq.), and implementing regulations at 50 CFR 402.

We also completed an essential fish habitat (EFH) consultation on the proposed action, in accordance with section 305(b)(2) of the Magnuson-Stevens Fishery Conservation and Management Act (MSA) (16 U.S.C. 1801 et seq.) and implementing regulations at 50 CFR 600.

We completed pre-dissemination review of this document using standards for utility, integrity, and objectivity in compliance with applicable guidelines issued under the Data Quality Act (DQA) (section 515 of the Treasury and General Government Appropriations Act for Fiscal Year 2001, Public Law 106-554). The document will be available through NMFS' Public Consultation Tracking System (<https://pcts.nmfs.noaa.gov/pcts-web/homepage.pcts>). A complete record of this consultation is on file at the NMFS Columbia Basin Branch office.

### **1.2 Consultation History**

We received a request for consultation and Biological Assessment (BA) from the Corps of Engineers (Corps) on April 10, 2017. The Corps determined that the project was "Not Likely to Adversely Affect" (NLAA) the Middle Columbia River (MCR) steelhead Distinct Population Segment (DPS) and designated critical habitat. We disagreed with this determination based on analyses in other recent Yakima River consultations (2011/01991; 2012/01745; WCR-2016-5868; WCR-2016-5869), and on a review of the best available science (citations in the Effects section of this document). On April 24, 2017, we informed the Corps we could not concur with their NLAA determination, and on May 1, 2017, we requested additional information that was necessary for us to analyze the effects of the proposed work.

On May 16, 2017, we toured the project with the Corps, United States Fish and Wildlife Service, and Yakima County, the local project sponsor. On May 22, 2017, the Corps sent the information we requested. We then had the information necessary to finish analyzing the effects of the proposed action and consultation was initiated.

### **1.3 Proposed Federal Action**

"Action" means all activities or programs of any kind authorized, funded, or carried out, in whole or in part, by federal agencies (50 CFR 402.02).

The Corps is proposing to restore ecosystem process, structure, and function in the Gap to Gap Reach of the Yakima River. The need for the action arises from the degradation of natural ecosystem processes stemming from the disconnection of the river with its historic floodplain, mainly due to the extensive levee system. The proposed action is authorized by section 1135 of the Water Resources and Development Act of 1986, as amended (section 1135). Section 1135 provides the Corps the authority to evaluate potential modifications to existing Corps projects for the purpose of improving the environment in the public interest. Measures at off-project locations that have been affected by the construction or operation of the project can be undertaken, if such measures do not conflict with the authorized project purpose.

The proposed action will restore more frequent inundation to a large area of historic floodplain while greatly improving off-channel habitat. The project actions span 4 miles of the river, from river mile (RM) 109 near the Spring Creek confluence to RM 113 just downstream of the Terrace Heights Bridge. The BA describes nine measures of the proposed action, which are summarized below.

*Measure 1.0: Diking Improvement District (DID) #1 Floodplain Process Restoration*

The Corps will remove all (1.7 miles) of the DID #1 levee to restore hydrology and natural processes to the historic floodplain. This levee is located on the left bank, immediately downstream of the State Route (SR) 24 bridge. The upstream end of the DID#1 levee currently ties into the downstream end of the Yakima Authorized left bank levee. The levee does not tie into high ground at the downstream end because it extends beyond the area of potential impacts from flooding.

By removing this levee, the total amount of shoreline armoring will be reduced by 9 percent in the 10-mile-long Gap to Gap Reach, and about 320 acres of floodplain will be reconnected to the river. An additional several hundred acres downstream could be incidentally activated as floodplain as a result of improved surface hydrology conditions.

The Corps will rebuild (i.e., set back) this levee to maintain the existing level of flood protection for features outside of the project area. The realigned levee design consists of two overlapping levee segments to manage flood risk while allowing the passage of Blue Slough, a distributary channel of the Yakima River, across the line of protection. Two small roads will be raised to ensure access to the new levee.

*Measure 1.1: Floodplain Topographic Restoration*

This measure is sited in the historic floodplain that will be reconnected to the river by Measure 1.0, on the left bank just south of the SR 24 Bridge. The area includes three decommissioned gravel pits (the Newland Pits) and upland disposal piles. The measure consists of the following three actions:

- 1) Removal of aggraded point bar material that has resulted from the fixed meander downstream of the SR 24 Bridge. When implemented with Measure 1.0, this will allow re-initiation of normal channel migration processes. It would also distribute energy more evenly across the channel, and reduce the potential for immediate avulsion into the pits.

- 2) Use of excavated material to place causeways in the three pits to reduce the risk and effect of floodplain pit capture and any associated headcutting upstream. In addition, all large trees and woody vegetation cleared as part of the project would be used as backfill within the ponds. The woody material would increase roughness and channel stability within the partially filled pits, would likely partially re-sprout, and enhance habitat.
- 3) Removal of remnant gravel pit spoils from the floodplain to allow the river more conveyance and wetted area within the floodplain area reconnected through Measure 1.0 and deposit of that material in the former pits.

Once the floodplain is regraded, the Corps expects the river will go out of bank at a 2-year frequency and begin sculpting side channels. The Corps will also excavate pilot channels to focus the flow energy into areas most likely to remain stable while the floodplain adjusts to levee removal.

#### *Measure 1.2: KOA Floodplain Restoration*

This measure is located on the left bank between Sportsman's Park and SR 24. In 2012, a large portion of the federal levee was rebuilt along a setback alignment under PL 84-99, but about 1,500 feet of remnant levee was left in place. The Corps will remove this remnant levee, reconnecting the river with about 15 acres of floodplain. The Corps will also remove an approximately 800-foot spur dike isolating this area from the DID #1 floodplain area downstream.

This measure will be dependent on Measure 1.0, which includes new levee construction to ensure that removal of the remnant levee does not increase offsite flooding. Removal of the remnant levee and the spur dike will allow water to flow freely into the restored DID #1 floodplain area. The Corps will use the removed fill as borrow material for the levee rebuild included in Measure 1.0. The federal levee and current SR 24 Bridge and approach have been designed to accommodate the increased erosion and scour risk associated with this restoration effort. A buried grade control sill will be installed to help mitigate the risks of floodplain overflows avulsing into the Newland Pits.

#### *Measure 2.0: Sportsman Island Channel Restoration*

This measure includes the restoration of the side channel that formed Sportsman Island. In the last several decades the river has occupied a single deep narrow channel at low flow, the side channel size has reduced, and the river has developed 3 "fixed" meanders. The "fixed meanders" have caused the associated point bars to aggrade with generally finer sands and gravels, which has buried most of the former side channel habitat on Sportsman Island. The main river channel has narrowed and incised, greatly simplifying available habitat and limiting spawning opportunities.

This measure will restore 20 acres of side channel habitat, reconnect the upstream and downstream ends of the island, allowing for additional conveyance, create a more even distribution of stream energy across this leveed reach (improving spawning conditions), and reconnect various side channels along the alignment. The Corps predicts the new channel will be

inundated at the 2-year flow, which will redistribute flow away from the right bank levee and reduce flood stages.

The Corps will excavate three relatively straight side channels requiring removal of approximately 100,000 cubic yards of alluvium and woody debris. The excavated material will be contributed towards Measure 1.0 and/or Measure 1.1. The design consists of two smaller anabranch channels at the head of the island that combine to form a 100-foot-wide, 2,550-foot-long primary side channel/anabranch that would tie in to an existing natural side channel towards the downstream end of the island. This constructed channel will also convey surface water to a smaller side channel that feeds water into Blue Slough. The Corps expects that natural processes will rapidly sculpt the banks and bed of the side channel, adding complexity (sinuosity, large wood, pool-riffle sequences, bars, side channels) that would be initially absent from the as-built channel.

#### *Measure 2.1: Sportsman Upstream Groin Removal*

A series of groins installed by the Corps following the 1996 flood have been effective at preventing erosion along the levee, but have been equally effective at shifting main flows towards the downstream right bank levee near Buchanan Lake. In addition, substrate has been accreting at the upstream end of the Sportsman's Park Island, preventing flow to side channels. The Corps will remove portions of the three downstream-most groins to encourage more flow to the island and its side channel habitat, including the channel the Corps will construct.

#### *Measure 2.2: Lake Buchanan Spurs*

The Corps will build a series of low, riprap spurs along the existing right bank federal levee adjacent to Buchanan Lake. These spurs will increase local water surface elevations, directing flow into the new pilot channel excavated through Sportsman Island (Measure 2.0), and they will reduce velocities and stream power in the main channel at the base of the levee. The spurs will be located at two sites along the levee, spaced 120 feet apart.

#### *Measure 4.0: Blue Slough Automated Headgate*

Blue Slough is a relic channel running about 2 miles parallel to the Yakima River. The inlet is at the Sportsman Park campground where flows can be controlled manually with a headgate to prevent flooding in the slough. The Corps will replace the headgate with an automated structure that will allow floodplain managers to maintain a normative hydrograph in the slough without increasing flood risk. The Corps will also remove sediment and debris at the culvert, install a trash rack, and install flow control weirs to ensure adequate head is available at low flows.

At the outlet back to the Yakima River, they will replace an existing energy dissipater with a pre-formed scour pool lined with riprap or river cobbles to dissipate energy and to provide resting areas for adult salmonids as they access the culvert. They will also add a flow control weir to partially backwater the culvert outlet to facilitate upstream passage by juvenile salmonids at low flows. Benefits would accrue to approximately 2 miles/12 acres of this historic channel as a result of this hydrologic restoration measure.

#### *Measure 4.1: Blue Slough Culverts*

The Corps estimates that, due to the backwater effect associated with 4 undersized culverts, flooding would begin at a flow of 20 cubic feet per second (cfs). The Corps will upgrade the undersized culverts that cross Blue Slough, a distributary of the Yakima River, at Sportsman's Park, Blue Crane Lane, an unnamed private road and Lester Lane. To meet Corps emergency management engineering requirements (ER 500-1-1), a hand-operated slide gate closure structure will be added to the culvert at either the unnamed road or at Lester Lane. Upgrading the four undersized culverts will significantly improve passage for all native salmonids and life stages through Blue Slough. Passage in the Yakima River will not be affected.

#### *Measure 7.0: Spring Creek Reconnection*

Spring Creek is a groundwater fed tributary of the Yakima River. Since construction of Interstate 82 in the 1970s, Spring Creek has flowed across a compacted former haul road, creating an approximate 3-foot waterfall into a former gravel pit. This has disconnected this valuable spawning and rearing habitat from the Yakima River. The Corps will remove the compacted road bed, restoring fish access to 14 acres of locally rare, cold water off-channel habitat.

For all of these measures combined, the Corps estimates that approximately 21,700 square feet (sq ft) of benthic habitat will be disturbed by heavy equipment (when building the spurs), and approximately 26 acres of vegetation will be removed. Most of the vegetation will not be along the water but elsewhere on the floodplain (e.g., Sportsman Island and landward of the existing DID#1 levee). This vegetation removal will be necessary for the long-term benefit of improved floodplain connectivity and normative river processes.

Measures including in-water work that could affect steelhead include the Sportsman Island channel restoration, rock groin removal upstream of Sportsman Island, spur construction at the Lake Buchanan levee, and the road bed removal in Spring Creek. The in-water work will occur from October 1 through February 28. In-water work is expected to last two construction seasons. The BA identifies conservation measures and best management practices, which we incorporate here by reference. In addition, the Corps will place rock individually in the river, rather than dumping it when they build the spurs. They will also release water slowly into any newly excavated channels (e.g., on Sportsman Island) to minimize suspended sediment delivery. Finally, the Corps will implement a water quality sampling protocol. In summary, they will regularly monitor turbidity 300 feet downstream of sediment-generating activities. Maximum turbidity levels will meet WAC 173-201A-210 (i.e., turbidity must not exceed 5 Nephelometric Turbidity Units (NTUs) over background when the background is 50 NTUs or less; or a 10-percent increase in turbidity when the background turbidity is more than 50 NTUs). If turbidity levels exceed these values, activities will cease and actions will be taken to avoid or reduce turbidity levels.

“Interrelated actions” are those that are part of a larger action and depend on the larger action for their justification. “Interdependent actions” are those that have no independent utility apart from the action under consideration (50 CFR 402.02). After completion of construction, Yakima County, would assume operations and maintenance responsibility for the entire project footprint. For example, some maintenance of the Blue Slough headgate, such as removing debris could be required, and levee maintenance could include repairs and vegetation removal. If any of this

work has to occur below the ordinary high water mark, the County would need a permit from the Corps, and the Corps would decide if consultation with NMFS was warranted.

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

The ESA establishes a national program for conserving threatened and endangered species of fish, wildlife, plants, and the habitat upon which they depend. As required by section 7(a)(2) of the ESA, each federal agency must ensure that its actions are not likely to jeopardize the continued existence of endangered or threatened species, or adversely modify or destroy their designated critical habitat. Per the requirements of the ESA, federal action agencies consult with NMFS and section 7(b)(3) requires that, at the conclusion of consultation, NMFS provides an Opinion stating how the agency's actions would affect listed species and their critical habitats. If incidental take is reasonably certain to occur, section 7(b)(4) requires NMFS to provide an ITS that specifies the impact of any incidental taking and includes non-discretionary reasonable and prudent measures (RPMs) and terms and conditions to minimize such impacts.

### **2.1 Analytical Approach**

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

This Opinion relies on the definition of “destruction or adverse modification,” which “means a direct or indirect alteration that appreciably diminishes the value of critical habitat for the conservation of a listed species. Such alterations may include, but are not limited to, those that alter the physical or biological features essential to the conservation of a species or that preclude or significantly delay development of such features” (81 FR 7214).

The designation of critical habitat for MCR steelhead uses the term primary constituent element (PCE) or essential features. The new critical habitat regulations (81 FR 7414) replace this term with physical or biological features (PBFs). The shift in terminology does not change the approach used in conducting a “destruction or adverse modification” analysis, which is the same regardless of whether the original designation identified PCEs, PBFs, or essential features. In this Opinion, we use the term PBF to mean PCE or essential feature, as appropriate for the specific critical habitat.

We use the following approach to determine whether a proposed action is likely to jeopardize listed species or destroy or adversely modify critical habitat:

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

- Describe the environmental baseline in the action area.
- Analyze the effects of the proposed action on both species and their habitat using an “exposure-response-risk” approach.
- Describe any cumulative effects in the action area.
- Integrate and synthesize the above factors by: (1) reviewing the status of the species and critical habitat; and (2) adding the effects of the action, the environmental baseline, and cumulative effects to assess the risk that the proposed action poses to species and critical habitat.
- Reach a conclusion about whether species are jeopardized or critical habitat is adversely modified.
- Suggest a reasonable and prudent alternative to the proposed action, if necessary.

## 2.2 Rangewide Status of the Species and Critical Habitat

This Opinion examines the status of each species that would be adversely affected by the proposed action. The status is determined by the level of extinction risk that the listed species face, based on parameters considered in documents such as recovery plans, status reviews, and listing decisions. This informs the description of the species’ likelihood of both survival and recovery. The species status section also helps to inform the description of the species’ current “reproduction, numbers, or distribution” as described in 50 CFR 402.02. The Opinion also examines the condition of critical habitat throughout the designated area, evaluates the conservation value of the various watersheds and coastal and marine environments that make up the designated area, and discusses the current function of the essential PBFs that help to form that conservation value.

### 2.2.1 Status of the Species

When examining the status of a species, NMFS uses criteria that describe a “Viable Salmonid Population” (VSP) (McElhany et al. 2000). Attributes associated with a VSP are the levels of abundance (number of adult spawners in natural production areas), productivity (adult progeny per parent), and the spatial structure and diversity necessary to: (1) safeguard the genetic diversity of the listed Evolutionarily Significant Unit (ESU) or DPS, (2) enhance its capacity to adapt to various environmental conditions, and (3) allow it to become self-sustaining in the natural environment.

In 2007, the Interior Columbia Basin Technical Recovery Team (ICTRT) further defined population-level viability criteria to address, abundance, productivity, spatial structure and diversity (ICTRT 2007a). These viability attributes are influenced by survival, behavior, and experiences throughout the entire life cycle, characteristics that are influenced in turn by habitat and other environmental conditions. The present risk faced by the ESU/DPS informs NMFS’ determination of whether additional risk will appreciably reduce the likelihood that the ESU/DPS will survive or recover in the wild. The greater the present risk, the more likely any additional risk resulting from the proposed action’s effects on the abundance (population size), productivity, distribution, or genetic diversity of the ESU/DPS will be an appreciable reduction (McElhany et al. 2000).

**Middle Columbia River Steelhead.** 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), August 15, 2011 (76 FR 50448), and May 26, 2016 (81 FR 33468). The DPS includes all naturally-spawning populations of steelhead using tributaries upstream and exclusive of the Wind River, Washington, and the Hood River, Oregon, excluding the Upper Columbia River and its tributaries (upstream of the Yakima River) and the Snake River. The ICTRT (2007b) identified 20 populations in four major population groups (MPGs) (Eastern Cascades, John Day River, the Umatilla River/Walla Walla drainages, and the Yakima River). Three of these populations are extinct: the White Salmon and Crooked River populations in the Eastern Cascades MPG, and the Willow Creek population in the Umatilla River/Walla Walla MPG. Seven artificial propagation programs are considered part of the DPS: the Touchet River Endemic, Yakima River Kelt Reconditioning Program (in Satus Creek, Toppenish Creek, Naches River, and Upper Yakima River), Umatilla River, and the Deschutes River steelhead hatchery programs. Major watersheds within this DPS include the Klickitat, Fifteen Mile, Deschutes, John Day, Umatilla, Yakima, and Walla Walla River Basins. NMFS has defined the steelhead DPSs to include only the anadromous members of this species (70 FR 67130).

Our approach to assessing the current status of a steelhead DPS is based on evaluating information on the abundance, productivity, spatial structure, and diversity of the anadromous component of this species (Good et al. 2005, 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 (Ford 2011).

**Life History.** Life history characteristics for MCR steelhead are similar to those of other inland steelhead DPSs. Most fish smolt at two years and spend one to two years in salt water before re-entering freshwater, where they may remain up to a year before spawning (Howell et al. 1985). All steelhead upstream of The Dalles Dam 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 and spring, 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 2005a).

**Abundance and Productivity.** According to the most recent 5-year status review (2010 to 2014 data), 7 of 15 populations are currently above the minimum abundance thresholds identified by the ICTRT (Northwest Fisheries Science Center (NWFSC) 2015). There are insufficient data to identify five-year abundances for the Klickitat River and Rock Creek. Total escapement and natural-origin escapements for all five John Day populations increased relative to Ford's (2011) prior 5-year review. 5-year geometric mean natural origin and total abundance estimates for all

four populations in the Yakima River MPG also increased relative to the prior review (Table 1). Total spawning escapements have increased in the most recent brood cycle for all three populations in the Umatilla-Walla Walla MPG as well. In the Eastern Cascades MPG, total escapement and natural-origin escapements for two of three populations have increased since the previous 5-year review.

The proposed action will take place within the Yakima River Basin MPG population boundaries and will affect the Naches and Upper Yakima populations. The MCR Steelhead Recovery Plan (NMFS 2009) characterized five MCR steelhead populations as being at high risk of extinction in terms of abundance based on 1995 to 2004 spawner numbers. Two of those high-risk populations included the Naches and Upper Yakima. However, Ford (2011) rated the Naches population integrated abundance and productivity risk as moderate, and the Upper Yakima River population risk was also rated moderate in the NWFSC (2015) review. The Satus and Toppenish Creek populations were rated low for the integrated abundance and productivity risk of extinction NWFSC (2015). Recent spawner abundances are given in Table 1.

**Table 1.** Minimum abundance thresholds set by the Interior Columbia Basin Technical Recovery Team (ICTRT 2007b), and the most recent 5-year geometric mean of natural spawner counts for Yakima River steelhead populations (NWFSC 2015).

Population	ICTRT minimum abundance threshold	Natural spawner abundance, 2005–2009	Natural spawner abundance, 2010–2014
Satus Creek	1,000	807	1,585
Toppenish Creek	500	468	575
Naches River	1,500	823	1,775
Upper Yakima River	1,500	155	390

**Spatial Structure and Diversity.** The NWFSC (2015) reported no change in the integrated spatial structure and diversity risk for all 17 MCR steelhead populations relative to the previous status review by Ford (2011). Two populations are considered to be at low risk, 14 at moderate risk, and 1 with a high risk of extinction based on spatial structure and diversity criteria. Within the Yakima River MPG, Satus and Toppenish Creeks, and the Naches River are at moderate risk of extinction, while the Upper Yakima population is characterized as high risk.

**Biological Risk Summary.** The NWFSC (2015) reported that there have been improvements in the viability ratings for some of the component populations, but the MCR Steelhead DPS is not currently meeting the viability criteria described in the Mid-Columbia Steelhead Recovery Plan. Natural origin returns to the majority of populations in two of the four MPGs in this DPS increased modestly relative to the levels reported in the previous 5-year review. Abundance estimates for 2 of 3 populations with sufficient data in the remaining two MPGs (Eastside Cascades and Umatilla/Walla Walla) were marginally lower. Updated information indicates that stray levels into the John Day River populations have decreased in recent years. Out-of-basin hatchery stray proportions, although reduced, remain high in spawning reaches within the Deschutes River Basin populations. In general, the majority of population level viability ratings remained unchanged from prior reviews for each MPG within the DPS (NWFSC 2015). For the Yakima River MPG, NWFSC (2015) gave overall viability ratings of Viable for the Satus and Toppenish Creek populations, Moderate for the Naches River population, and High Risk for the Upper Yakima River population.

**Climate Change.** Climate change has negative implications for salmon, steelhead, and their designated critical habitat in the Pacific Northwest (Independent Scientific Advisory Board (ISAB) 2007, Scheuerell and Williams 2005, Zabel et al. 2006). Average annual Northwest air temperatures have increased by approximately 1°C since 1900, or about 50 percent more than the global average over the same period (ISAB 2007). The latest climate models project a warming of 0.1°C to 0.6°C per decade over the next century.

Several studies have demonstrated that climate change has the potential to affect ecosystems in nearly all tributaries throughout the Interior Columbia Basin (Battin et al. 2007, ISAB 2007). While the intensity of effects will vary by region (ISAB 2007), climate change is generally expected to alter aquatic habitat (water yield, peak flows, and stream temperature). As climate change alters the structure and distribution of rainfall, snowpack, and glaciations, each factor will in turn alter riverine hydrographs. Given the increasing certainty that climate change is occurring and is accelerating (Battin et al. 2007), NMFS anticipates salmonid habitats will be affected. Climate and hydrology models project significant reductions in both total snow pack and low-elevation snow pack in the Pacific Northwest over the next 50 years (Mote and Salathé 2009), changes that will shrink the extent of the snowmelt-dominated habitat available to salmon. Such changes may restrict our ability to conserve diverse salmon life histories.

The earth's oceans are also warming, with considerable inter-annual and inter-decadal variability superimposed on the longer-term trend (Bindoff et al. 2007). Historically, warm periods in the coastal Pacific Ocean have coincided with relatively low abundances of salmon and steelhead, while cooler ocean periods have coincided with relatively high abundances (Scheuerell and Williams 2005, Zabel et al. 2006, U.S. Global Change Research Program (USGCRP) 2009). Ocean conditions adverse to salmon and steelhead may be more likely under a warming climate (Zabel et al. 2006). Moreover, as atmospheric carbon emissions increase, increasing levels of carbon are absorbed by the oceans, changing the pH of the water. Marine fish species have exhibited negative responses to ocean acidification conditions that include changes in growth, survivorship, and behavior. Marine phytoplankton species have shown diverse responses to elevated pCO<sub>2</sub> under laboratory conditions including changes in growth rate and calcification (reviewed in Feely et al. 2012).

The ISAB identified a number of effects climate change would have on Columbia Basin salmon. A few of these include: 1) water temperature increases, and depletion of cold water habitat that could reduce the amount of suitable salmon habitat by about 22 percent by 2090 in Washington State, 2) variations in precipitation that may alter the seasonal hydrograph and modify shallow mainstem rearing habitat, and 3) earlier snowmelt and higher spring flows with warmer temperatures that may cause spring Chinook salmon and steelhead yearlings to smolt and emigrate to the ocean earlier in the spring (ISAB 2007, O'Neal 2002).

Climate change is expected to make recovery targets for these salmon populations more difficult to achieve. However, habitat restoration action can address the adverse impacts of climate change on salmon. Examples include restoring connections to historical floodplains, and freshwater and estuarine habitats to provide fish refugia and areas to store excess floodwaters; protecting and restoring riparian vegetation to ameliorate stream temperature increases; and

purchasing or applying easements to lands that provide important cold water or refuge habitat (Battin et al. 2007, ISAB 2007).

### 2.2.2 Status of Critical Habitat

Critical habitat includes the stream channels to the lateral extent defined by the Ordinary High Water Mark (33 CFR 319.11). In 2005, in designating critical habitat, NMFS designated only those habitats that were occupied and contained certain habitat attributes called “primary constituent elements” (PCEs, now referred to as PBFs) that are essential to support one or more life stages. The 2005 designation also analyzed areas that will provide the greatest biological benefits for listed salmon and balanced the economic and other costs for areas considered for designation. The PBFs are identified in the documents designating critical habitat (NMFS 2005b).

NMFS designated critical habitat for MCR steelhead in the Upper Yakima, Naches, Lower Yakima, Middle Columbia/Lake Wallula, Walla Walla, Umatilla, Middle Columbia/Hood, Klickitat, Upper John Day, North Fork John Day, Middle Fork John Day, Lower John Day, Lower Deschutes, Trout, and Upper Columbia/Priest Rapids subbasins; and the Columbia River migration corridor. There are 114 watersheds within the range of this DPS. Nine watersheds received a low conservation value rating, 24 received a medium rating, and 81 received a high rating (NMFS 2005b). Conservation ranking is related to a number of factors, and does not necessarily reflect the quality or condition of PBFs within the various watersheds.

Many factors, both human-caused and natural, have contributed to the decline of the functional condition of the essential features of PBFs 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 PBFs 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).

Climate change is expected to alter critical habitat as described in Section 2.2 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.

The three freshwater PBFs that are present in the action area are listed below in Table 2, and the condition of these PBFs in the action area is discussed in greater detail in the Environmental Baseline section, which follows.

**Table 2.** Critical habitat physical and biological features relevant to this consultation.

PBF Site	PBF Characteristics	Species Life Stage
Freshwater spawning	Water quality, water quantity, substrate	Spawning, incubation, and larval development
Freshwater rearing	Water quantity, floodplain connectivity	Juvenile growth and mobility
	Water quality, forage	Juvenile development
	Natural cover	Juvenile mobility and survival
Freshwater migration	Free of artificial obstructions, water quality and quantity, natural cover	Juvenile and adult mobility and survival

### 2.3 Action Area

“Action area” means all areas to be affected directly or indirectly by the federal action and not merely the immediate area involved in the action (50 CFR 402.02).

The action area will extend from the upstream-most rock groin the Corps will remove upstream of Sportsman Island, to 300 feet downstream of the point where Blue Slough empties back into the Yakima River mainstem. This encompasses the area where fish could potentially be exposed to increased suspended sediment concentrations. The action area is used by MCR steelhead, including the Naches and Upper Yakima River populations, and is designated critical habitat (September 2, 2005, 70 FR 52630). This area serves as a migration corridor, rearing habitat, and

potentially as spawning habitat. The action area is also designated as EFH for Chinook salmon and coho salmon (Pacific Fishery Management Council (PFMC) 2014).

## **2.4 Environmental Baseline**

The “environmental baseline” includes the past and present impacts of all federal, state, or private actions and other human activities in the action area, the anticipated impacts of all proposed federal projects in the action area that have already undergone formal or early section 7 consultation, and the impact of state or private actions that are contemporaneous with the consultation in process (50 CFR 402.02).

The Yakima River in the action area is designated MCR steelhead critical habitat, serving as a migration corridor for adults to reach key upstream spawning habitat, and potentially serving as spawning habitat. The mainstem also provides a migration corridor and year-round rearing habitat for juveniles.

Threats and limiting factors for the Naches and Upper Yakima steelhead populations are described in the 2009 Yakima Steelhead Recovery Plan (Conley et al. 2009). Two major threats affecting conditions in the action area are floodplain development (including the levee system), and Yakima River flow regulation. Floodplain development has displaced what was once a large network of diverse channel and floodplain habitats, which provided excellent habitat for steelhead. The majority of the floodplain is now occupied by agricultural, suburban, and urban development. In addition, most of the floodplain is isolated from the river by levees and transportation infrastructure.

Effects of floodplain development and the levee system in the action area include: (1) an extensive restriction of the channel migration zone, reducing or eliminating large wood and sediment recruitment and other processes that help create aquatic habitat; (2) blocked access to the floodplain, impairing or preventing many ecological processes (e.g., fish access to off-channel habitats, nutrient exchange, hyporheic zone function), and ensuring on-going flood damage to the levee system; (3) an extensive reduction in riparian zone vegetation and function, including the food, shade, and overhead cover it provides for fish; and (4) decreased water quality due to pollutants delivered from developed areas.

Channelization in the Yakima River has also resulted in incision of the main channel (J. Freudenthal, Senior Natural Resources Specialist, Yakima County, pers. comm), reducing connectivity with side channels that typically provide productive habitat. In addition, this channelization has caused bed sediments to become coarser (J. Freudenthal, Senior Natural Resources Specialist, Yakima County, pers. comm), which appears to have reduced the potential for steelhead spawning.

At a more localized scale, levee face edge habitat is severely limited in rearing potential due to the riprap and to limited riparian vegetation. Riprapped banks without wood or roughness support lower forage densities and less habitat complexity for salmonids. In addition, riprap and other large rock that has been eroded away from the levees impairs benthic habitat, for example by covering potential spawning gravels.

In an unregulated condition, flows in the Yakima Basin would be dominated by snowmelt-driven discharge peaks in May or June that then decline to ground-water-driven base flows in August and September. Late autumn rainfall and minor snowmelt would augment summer base flow, with Chinook winds causing occasional winter high water events. Steelhead are adapted to these natural seasonal flow patterns, which maintained a variety of habitats and facilitated migratory behavior (Conley et al. 2009).

Managed flow now provides discharge out of phase with the natural hydrograph, reducing the ability of the action area to support critical habitat functions and productivity of MCR steelhead. Generally, instream flow problems stem from chronically low discharge levels in spring during reservoir refill periods to inordinately high flows when downstream irrigation demands are being met. Thus, the hydrograph exhibits diminished winter and spring flows, and unnaturally high flows from late July through August. These flows are out of phase with the ecology of MCR steelhead. For example, sustained high flows associated with irrigation water deliveries are hypothesized to reduce growth and survival of young-of-the-year steelhead and promote residency for older juveniles (Conley et al. 2009).

NMFS has produced two other Opinions for actions that occurred within the action area of the proposed project. In the Yakima Authorized Levee System Repairs consultation, we determined in-water work would kill or injure 84 juvenile steelhead (NMFS Consultation Number: 2012/01745). These 84 fish were spread across multiple cohorts because construction extended from winter 2009 to summer 2012. Most of these fish would presumably be from the Naches population.

In the Jefferies and Jensen Levee Rehabilitation consultation, we determined in-water work would kill or injure 2 juvenile steelhead (NMFS Consultation Number: 2011/01991). We also concluded that the action would perpetuate an existing disconnection of 2,028 acres of property landward of the levees by restricting channel migration. However, the project also provided for reconnection of 115 acres of formerly isolated floodplain habitat, which would restore significant ecological functions, including salmonid rearing, flood refuge, and possibly spawning. We determined that this was likely to cause an incremental increase in the conservation value of critical habitat PCEs in the action area.

## **2.5 Effects of the Action**

Under the ESA, “effects of the action” means the direct and indirect effects of an action on the species or critical habitat, together with the effects of other activities that are interrelated or interdependent with that action, that will be added to the environmental baseline (50 CFR 402.02). Indirect effects are those that are caused by the proposed action and are later in time, but still are reasonably certain to occur.

### 2.5.1 Effects on ESA-Listed Species

**Steelhead presence in the action area.** During the October 1 through February 28 in-water work window, steelhead juveniles of at least two age classes will be present in the action area and within the project footprint. Low numbers of adults may also be present in the action area.

**Mechanical Injury.** We expect that some juvenile steelhead present during construction at the rock groin removal and spur construction sites will seek refuge in porous substrates such as cobble and riprap. Therefore, they are at risk of being crushed by equipment or buried by riprap placed to build the spurs. NMFS expects that, due to very low densities of adult MCR steelhead in the Yakima River during construction, none will be exposed to construction effects.

We referred to steelhead densities reported in Mullan et al. (1992) to estimate the number of juvenile fish that will be directly injured or killed by burial or crushing. Mullan et al. (1992) reported that juvenile steelhead densities in poor quality habitat in Columbia River tributaries averaged 2.4 per 120 square yards (1.3 age-0, plus 1.1 parr per 120 square yards). NMFS considers the levee site where the spurs will be built to be poor quality because it is composed of riprap with little habitat complexity and minimal riparian function. The rock groins provide relatively better habitat due to some limited hydraulic complexity. We applied a density of 12.3 juvenile steelhead per 120 square yards to this “average” habitat (Mullan et al. 1992).

We estimate that 25 percent of steelhead occupying the rock groin (1,320 sq ft) and spur (21,700 sq ft) footprints will be injured or killed; some fish will flee the immediate area, and others will be protected within the matrix of existing riprap. Given these in-water construction footprints and the estimated densities noted above, we estimate that construction will injure or kill 16 juvenile steelhead. Using steelhead life-stage survival rates in Quinn (2005), this would be a 0.28 adult equivalent. We consider this a maximum effect because some of the *O. mykiss* affected by the action are likely resident forms. Thus, while we estimate the death or injury total to be 16 juvenile steelhead, this is likely an overestimate and the effect to the population will likely be less.

**Suspended Sediments.** The Corps’ in-water activities are likely to increase suspended sediment concentrations. However, by placing the rock individually, the amount of substrate that will be disturbed will be minimal, the disturbance will not be continuous, and the suspended sediment will be quickly diluted by the current. In addition, the Corps will monitor turbidity and will halt in-water activities if turbidity measured 300 feet downstream of the in-water activity exceeds background levels by 5 NTUs. These efforts will keep suspended sediment concentrations low and will limit the duration of potential exposure. Based on criteria outlined in Newcombe and Jensen (1996), adverse effects will be unlikely.

**Benthic Habitat Disturbance and Riparian Vegetation Removal.** The Corps will disturb about 1,320 sq ft of substrate to remove the rock groins (based on the estimated footprint of the rock groins just upstream that we recently consulted on; NMFS tracking number: WCR-2016-5868) and about 21,700 sq ft to build the spurs. These activities will kill or displace benthic invertebrates, reducing available forage for juvenile steelhead. Aquatic invertebrates could start recolonizing within days to months after construction (Miller and Golladay 1996, Paltridge et al.

1997, Fowler 2004, Korsu 2004). Some aquatic insect life cycles can extend up to 3 years (Pennak 1953, Hilsenhoff 1981), but most aquatic insects in the north temperate zone have an annual life cycle (Merritt and Cummins 1996). Thus, we estimate that recolonization of the disturbed areas will mostly occur within a year.

The Corps will also remove vegetation from the floodplain. Most removal will occur away from flowing water (e.g., on Sportsman Island and landward of the DID#1 levee), but some loss of allochthonous input, such as leaf litter and terrestrial insect fallout will still occur, affecting juvenile steelhead forage availability. As the new off-channel habitat (e.g., on Sportsman Island) becomes available to fish within one or two years of project initiation, forage availability will increase above current baseline conditions.

Together, the benthic habitat disturbance and loss of allochthonous input will decrease potential forage production and availability to juvenile steelhead. Food, related to degraded or reduced riparian vegetation, is one of the limiting factors for the lower mainstem and upper Yakima River (Conley et al. 2009). James' et al. (1999) data suggested that rainbow trout, spring-run Chinook salmon, mountain whitefish, and redside shiner were all competing for food, and Parsons et al. (2001) concluded that food was limiting growth of rainbow trout and spring-run Chinook salmon.

Based on this information, it is likely that a forage decrease due to the proposed action will increase competition for food among steelhead juveniles, requiring expenditure of extra energy, and thus slower growth. Slower-growing individuals will be more susceptible to predation and have decreased chances for overwinter survival. This effect will last about a year until benthic invertebrates recolonize the action area and new off-channel habitat becomes available, which will provide additional benthic production and more aquatic area to receive allochthonous input.

### 2.5.2 Effects to Critical Habitat

The PBF characteristics affected by the proposed action are water quality, floodplain connectivity, substrate, forage, and natural cover.

**Water Quality.** In-water construction activities will increase suspended sediments. This will only affect water quality during and immediately following construction, causing no long-term effects to critical habitat.

**Floodplain Connectivity.** Levees restrict normal river processes such as channel migration and floodplain access, preventing side channel formation, erosion of natural banks, and large wood recruitment; all processes that support other PBFs. The confined channel increases the river's erosive power during high water events. This has led to coarsening of bed sediments and to incision of the Yakima River channel (J. Freudenthal, Senior Natural Resources Specialist, Yakima County, pers. comm.), vertically isolating the river from the floodplain areas that are not protected by levees. The proposed action, including levee removal, will help restore floodplain connectivity and function.

**Substrate.** Levees can prevent spawning gravel recruitment that would otherwise occur via bank erosion and entrainment in an unconfined channel. Bank erosion also provides a sediment source that creates riparian habitat, creates and maintains diverse structure and habitat functions, and modulates changes in channel morphology and pattern (Florsheim et al. 2008). The proposed action will increase opportunity for gravel recruitment and substrate sorting.

**Forage.** The Corps will remove riparian vegetation and disturb or cover about 23,000 sq ft of substrate, which will temporarily reduce forage availability. However, the proposed action will result in new, off-channel habitat, and better floodplain function in general, which will provide more diverse aquatic habitat and an increased riparian zone. This will result in more forage availability in the long term.

**Natural Cover.** Restoring floodplain function will increase habitat complexity, providing more natural cover. For example, there will be increased riparian area and vigor, providing overhead cover and large wood recruitment. There will also be increased off-channel habitat, providing shallow water cover for juvenile steelhead, and refuge during high flows.

In summary, there will be short-term effects to some of the PBF characteristics due to construction activities. Beginning the next season after construction, all of these PBFs will improve well beyond current baseline conditions due to restored floodplain function. The proposed action will address habitat recovery strategies identified in the Yakima Steelhead Recovery Plan, including restoring floodplain connectivity and function, restoring channel structure and complexity, and restoring riparian condition and future large wood recruitment (Conley et al. 2009).

## 2.6 Cumulative Effects

“Cumulative effects” are those effects of future state or private activities, not involving federal activities, that are reasonably certain to occur within the action area of the federal action subject to consultation (50 CFR 402.02). Future federal actions that are unrelated to the proposed action are not considered in this section because they require separate consultation pursuant to section 7 of the ESA.

In the Yakima Steelhead Recovery Plan, Conley et al. (2009) report that rapid population growth and development is occurring in both Yakima and Kittitas Counties. In many areas, forest and agricultural lands are being converted to residential, commercial, and industrial uses. This development is often located adjacent to streambanks, which can result in the reduction or elimination of riparian zones and increased flood hazards. The probability of conflict between new land uses and floodplain and stream channel functions (which sustain fish habitat and conveyance of water and sediment) is high (Conley et al. 2009). These changes in land use will probably affect other habitat features such as water quality and quantity, which are important to the survival and recovery of the listed species. The overall effect will likely be negative unless carefully planned for, and mitigated, or avoided.

Yakima County, the City of Yakima, the Bureau of Reclamation, the Corps and other partners have invested considerable effort in the past 10 years into planning and implementing work to

acquire floodplain properties, demolish structures, and set back existing levees in the Gap to Gap reach. River channel restoration is expected to continue through the Gap to Gap Floodplain Restoration and Enhancement Plan [Plan]). Projects included in the Plan address the fish habitat restoration goals set forth in the Yakima Steelhead Recovery Plan. These activities will continue to reduce the impacts of the Yakima Authorized levee system, and some of them will not involve federal actions. In general, these activities will continue to improve the conservation value of critical habitat in the action area.

We did not identify any other future non-federal activities that would significantly change the present pattern of land uses and stressors to steelhead. In total, due to the continuing efforts of local communities to restore floodplain function in the Gap to Gap reach, we expect beneficial cumulative effects will outweigh the negative effects of continued development in the action area.

## **2.7 Integration and Synthesis**

The Integration and Synthesis section is the final step in our assessment of the risk posed to species and critical habitat as a result of implementing the proposed action. In this section, we add the effects of the action (Section 2.5) to the environmental baseline (Section 2.4) and the cumulative effects (Section 2.6), taking into account the status of the species and critical habitat (Section 2.2), to formulate the agency's Opinion as to whether the proposed action is likely to: (1) appreciably reduce the likelihood of both the survival and recovery of a listed species in the wild by reducing its numbers, reproduction, or distribution; or (2) appreciably diminish the value of designated or proposed critical habitat for the conservation of the species.

The MCR steelhead DPS is unviable because a majority of populations are at moderate risk of extinction. The DPS cannot achieve viability without significant improvements in abundance, productivity, and diversity for many populations. The Upper Yakima and Naches populations of MCR steelhead are present in the action area. The Upper Yakima is among those populations most at risk in the DPS. Despite increased abundance in recent years, the Upper Yakima and Naches populations are short of recovery goals for both abundance and productivity. Urban development, logging, grazing, power generation, and agriculture have all resulted in the loss of important spawning and rearing habitat, and the loss or degradation of migration corridors.

Within the action area, the primary impacts limiting recovery of MCR steelhead and their critical habitat are flow regulation and human development in the floodplain, including miles of federal levees. Cumulative effects are likely to improve habitat functions to some degree as local governments pursue floodplain restoration and focus additional floodplain development in areas that will have limited impact.

The proposed action will affect juveniles through construction activities. We estimate 16 juveniles will be injured or killed during construction activities. The number injured or killed would be the equivalent of 0.3 adult steelhead. We believe we have been liberal in expanding the effects to juveniles, and thus up to the adult population level (i.e., our adult equivalent estimate assumes that all juvenile *O. mykiss* affected are steelhead and that they will all die from those

effects). There will also be a short-term decrease in forage, which will lead to slower growth and thus decreased survival of some juvenile steelhead. This effect will last about a year until benthic invertebrates recolonize the action area, and restored floodplain connectivity begins to provide additional benthic productivity and allochthonous input. We could not confidently estimate the number of individuals that will be affected, but they will be spread over two to three cohorts from both the Naches and Upper Yakima populations, so effects in terms of adult equivalents will be very minimal.

In the context of each population's 5-year geometric mean abundance (1,775 spawners for the Naches population and 390 for the Upper Yakima population), we do not expect the death of these juveniles to meaningfully affect adult returns. Even in consideration of the impaired status of the two populations, the environmental baseline, and expected cumulative effects in the action area, the number of steelhead that will be injured or killed will be too small to affect abundance and productivity at the population level, much less at the MCR DPS level. The small number of adult equivalents lost will also not affect spatial structure or diversity of the populations.

The proposed action will also result in a long-term improvement to the floodplain connectivity, substrate, forage, and natural cover PBF characteristics, which will show increased function above the current, degraded habitat baseline. There will be an increase in conservation value of the critical habitat in the action area by virtue of the increase in available area and of the increased quality (broader range of thermal regimes, cover types, substrate types, etc.). We expect that because of these improvements, more adults will spawn here, more juveniles will rear here, and those that do will survive at better than average rates. We cannot yet predict the extent of these improvements, but it is very reasonable to expect that they will be significant.

## **2.8 Conclusion**

After reviewing and analyzing the current status of the listed species and critical habitat, the environmental baseline within the action area, the effects of the proposed action, any effects of interrelated and interdependent activities, and cumulative effects, it is NMFS' Opinion that the proposed action is not likely to jeopardize the continued existence of MCR steelhead or destroy or adversely modify its designated critical habitat.

## **2.9 Incidental Take Statement**

Section 9 of the ESA and federal regulations pursuant to section 4(d) of the ESA prohibit the take of endangered and threatened species, respectively, without a special exemption. "Take" is defined as to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or to attempt to engage in any such conduct. "Harm" is further defined by regulation to include significant habitat modification or degradation that actually kills or injures fish or wildlife by significantly impairing essential behavioral patterns, including breeding, spawning, rearing, migrating, feeding, or sheltering (50 CFR 222.102). "Incidental take" is defined by regulation as takings that result from, but are not the purpose of, carrying out an otherwise lawful activity conducted by the federal agency or applicant (50 CFR 402.02). Section 7(b)(4) and section 7(o)(2) provide that taking that is incidental to an otherwise lawful agency action is not considered to be

prohibited taking under the ESA if that action is performed in compliance with the terms and conditions of this ITS.

#### 2.9.1 Amount or Extent of Take

In the Opinion, NMFS determined that incidental take of MCR steelhead is reasonably certain to occur due to exposure to mechanical injury and to a reduced forage base. Only the juvenile (young-of-year and yearling) life stages will be adversely affected. As discussed in and based on the methodology described in Section 2.5.1, we expect construction activities will injure or kill 16 juvenile steelhead.

Because of additional uncertainty in estimating the number of individuals that will be affected by reduced forage, we will use a habitat surrogate to account for this take. The extent of habitat change to which juvenile steelhead will be exposed is readily discernible and presents a reliable measure of the extent of take that can be monitored and tracked. Therefore, when the specific number of individuals “harmed” cannot be predicted, NMFS quantifies the extent of take based on the extent of habitat modified (June 3, 1986, 51 FR 19926 at 19954).

The estimated extent of habitat affected by construction activities represents the extent of take exempted in this ITS. The amount of take will increase as the area disturbed by construction activities increases. Therefore, the extent of take is best identified by the total area the Corps is proposing to excavate and fill (23,000 sq ft), and the total area of floodplain vegetation removal (26 acres); the effects of which have been analyzed in this Opinion. The Corps shall reinitiate consultation if their in-water construction footprint (i.e., the area where excavation or fill occurs) exceeds 23,000 sq ft or if the total area of floodplain vegetation removal exceeds 26 acres.

#### 2.9.2 Effect of the Take

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

#### 2.9.3 Reasonable and Prudent Measures

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

Full application of conservation measures included as part of the proposed action, together with use of the RPMs and terms and conditions described below, are necessary and appropriate to minimize the likelihood of incidental take of MCR steelhead due to completion of the proposed action.

The Corps shall minimize incidental take by:

1. Minimizing the extent of construction activities.
2. Minimizing effects on forage.

3. Monitoring the project to ensure that the conservation measures are meeting the objective of minimizing take and that the amount or extent of take is not exceeded.

#### 2.9.4 Terms and Conditions

The terms and conditions described below are non-discretionary, and the Corps or any applicant must comply with them in order to implement the RPMs (50 CFR 402.14). The Corps or any applicant has a continuing duty to monitor the impacts of incidental take and must report the progress of the action and its impact on the species as specified in this ITS (50 CFR 402.14). If the entity to whom a term and condition is directed does not comply with the following terms and conditions, protective coverage for the proposed action would likely lapse.

1. The following terms and conditions implement RPM 1:
  - a. Do not exceed an in-water footprint of 23,020 sq ft where working with construction equipment.
2. The following terms and conditions implement RPM 2:
  - a. Do not exceed an in-water footprint of 23,020 sq ft where aquatic invertebrates could be displaced, injured, or killed.
  - b. Do not exceed a vegetation disturbance footprint of 26 acres.
3. The following terms and conditions implement RPM 3:
  - a. Within 90 days following the completion of the proposed construction project, the Corps shall report all monitoring items to include, at a minimum, the following:
    - i. Project identification
      1. Project name: Yakima River Gap to Gap Ecosystem Restoration; NMFS Tracking Numbers: WCR-2017-6789
      2. Corps contact person
    - ii. Construction details
      1. Starting and ending dates for construction work
      2. Total area (sq ft) of in-water construction footprint
      3. Total area (sq ft) of floodplain vegetation disturbance
      4. Results of turbidity monitoring
      5. As-built plans
      6. A description of any elements of the project that were constructed differently than depicted in the BA, associated addendums and communications, or this Opinion
  - b. If take is exceeded, contact NMFS promptly to determine a course of action.
  - c. All reports will be sent to National Marine Fisheries Service, Washington State Habitat Office, Attention Jody Walters, 304 South Water Street, Suite 201, Ellensburg, Washington 98926. NOTICE: To follow inactive projects and, if necessary, withdraw the Opinion for an incomplete project, the Corps shall provide an annual report even if no actual work was completed in a particular year.

## **2.10 Reinitiation of Consultation**

This concludes formal consultation for the Yakima River Gap to Gap Ecosystem Restoration Project.

As 50 CFR 402.16 states, reinitiation of formal consultation is required where discretionary federal agency involvement or control over the action has been retained or is authorized by law and if: (1) the amount or extent of incidental taking specified in the ITS is exceeded, (2) new information reveals effects of the agency action that may affect listed species or critical habitat in a manner or to an extent not considered in this Opinion, (3) the agency action is subsequently modified in a manner that causes an effect on the listed species or critical habitat that was not considered in this Opinion, or (4) a new species is listed or critical habitat designated that may be affected by the action.

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

Section 305(b) of the MSA directs federal agencies to consult with NMFS on all actions or proposed actions that may adversely affect EFH. The MSA (section 3) defines EFH as “those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity.” Adverse effect means any impact that reduces quality or quantity of EFH, and may include direct or indirect physical, chemical, or biological alteration of the waters or substrate and loss of (or injury to) benthic organisms, prey species and their habitat, and other ecosystem components, if such modifications reduce the quality or quantity of EFH. Adverse effects on EFH may result from actions occurring within EFH or outside of it and may include site-specific or EFH-wide impacts, including individual, cumulative, or synergistic consequences of actions (50 CFR 600.810). Section 305(b) also requires NMFS to recommend measures that can be taken by the action agency to conserve EFH.

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

### **3.1 Essential Fish Habitat Affected by the Project**

The proposed project action area includes EFH for Chinook salmon (*O. tshawytscha*) and coho salmon (*O. kisutch*) (PFMC 2014). Habitat areas of particular concern within the action area include complex channel and floodplain habitat, and spawning habitat (PFMC 2014).

### **3.2 Adverse Effects on Essential Fish Habitat**

Based on information provided in the BA, associated communications, and the analysis of effects presented in the ESA portion of this document, NMFS concludes that the proposed action will adversely affect EFH designated for Chinook salmon and coho salmon. Construction activity will cause a reduction in forage production lasting about one year.

Specifically, NMFS has determined that the action will adversely affect EFH as follows:

1. Removal of riparian vegetation will decrease cover and allochthonous input (those most vegetation removal will not occur adjacent to the wetted channel).
2. In-water excavation will disturb, displace, and kill aquatic invertebrates (forage).

### **3.3 Essential Fish Habitat Conservation Recommendations**

We provide the following conservation recommendations:

1. Do not exceed an in-water footprint of 23,020 sq ft where aquatic invertebrates could be displaced, injured, or killed.
2. Do not exceed a vegetation disturbance footprint of 26 acres.

Fully implementing these EFH conservation recommendations would protect, by avoiding or minimizing the adverse effects described in Section 3.2, above, about 26.5 acres of designated EFH for Pacific Coast salmon.

### **3.4 Statutory Response Requirement**

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

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

### **3.5 Supplemental Consultation**

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

## 4. DATA QUALITY ACT DOCUMENTATION AND PRE-DISSEMINATION REVIEW

The DQA specifies three components contributing to the quality of a document. They are utility, integrity, and objectivity. This section of the Opinion addresses these DQA components, documents compliance with the DQA, and certifies that this Opinion has undergone pre-dissemination review.

### 4.1 Utility

Utility principally refers to ensuring that the information contained in this consultation is helpful, serviceable, and beneficial to the intended users. The intended user of this Opinion is the Corps. Other interested users could include the Bureau of Reclamation, Washington DFW, Yakama Nation, and Yakima County. Individual copies of this Opinion were provided to the Corps. This Opinion will be posted on the Public Consultation Tracking System website (<https://pcts.nmfs.noaa.gov/pcts-web/homepage.pcts>). The format and naming adheres to conventional standards for style.

### 4.2 Integrity

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

### 4.3 Objectivity

Information Product Category: Natural Resource Plan

**Standards:** This consultation and supporting documents are clear, concise, complete, and unbiased; and were developed using commonly accepted scientific research methods. They adhere to published standards including the NMFS ESA Consultation Handbook, ESA regulations, 50 CFR 402.01 et seq., and the MSA implementing regulations regarding EFH, 50 CFR 600.

**Best Available Information:** This consultation and supporting documents use the best available information, as referenced in the References section. The analyses in this Opinion and EFH consultation contain more background on information sources and quality.

**Referencing:** All supporting materials, information, data and analyses are properly referenced, consistent with standard scientific referencing style.

**Review Process:** This consultation was drafted by NMFS staff with training in ESA and MSA implementation, and reviewed in accordance with West Coast Region ESA quality control and assurance processes.

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REPLY TO  
ATTENTION OF

**DEPARTMENT OF THE ARMY**  
SEATTLE DISTRICT, CORPS OF ENGINEERS  
P.O. BOX 3755  
SEATTLE, WASHINGTON 98124-3755

Environmental and Cultural Resources Branch

**AUG 16 2017**

Mr. Barry Thom, Regional Administrator  
West Coast Region  
National Marine Fisheries Service  
1201 NE Lloyd Boulevard, Suite 1100  
Portland, Oregon 97232

Dear Mr. Thom:

Thank you for your July 13, 2017 letter to Melissa Leslie of the Environmental and Cultural Resources Branch, with the Biological Opinion (BiOp) and Magnuson-Stevens Fishery Conservation and Management Act (MSA) Essential Fish Habitat (EFH) response for the Yakima River Gap to Gap Ecosystem Restoration Project, Yakima, Washington. This letter is a response intended to meet the 30-day response requirement for the EFH Conservation Recommendations contained in the BiOp, pursuant to MSA Section 305(b)(4)(A).

The conservation recommendations set forth by NMFS in the EFH section of the BiOp are as follows:

- (1) Do not exceed an in-water footprint of 23,020 sq ft where aquatic invertebrates could be displaced, injured, or killed.
- (2) Do not exceed a vegetation disturbance footprint of 26 acres.

The Corps accepts both of the conservation recommendations. If you have any questions or require more details, please contact Ms. Melissa Leslie of Environmental and Cultural Resources Branch at 206-764-6587 or melissa.l.leslie@usace.army.mil.

Sincerely,

Evan R. Lewis  
Chief, Environmental and  
Cultural Resources Branch



# United States Department of the Interior



## FISH AND WILDLIFE SERVICE

**Washington Fish and Wildlife Office**  
Central Washington Field Office  
215 Melody Lane, Suite 103  
Wenatchee, Washington 98801-8122

JUL 06 2017

In Reply Refer To  
**01EWFW00-2017-I-1133**

Evan R. Lewis  
Chief, Environmental and Cultural Resources Branch  
Department of the Army  
Corps of Engineers  
P.O. Box 3755  
Seattle, WA 98124-3755

Dear Mr. Lewis:

This responds to your request for informal consultation on the proposed Yakima River Gap to Gap Ecosystem Restoration Project (Project) along the Yakima River in Yakima County, Washington. Your cover letter and biological assessment (BA) were received on April 12, 2017, in the U.S. Fish and Wildlife Service (Service) Central Washington Field Office. Further information was received on May 24, 2017 from the Department of the Army, Corps of Engineers (COE), at which point it was determined to be sufficient to complete consultation. This letter also responds to the COE request for the Service's concurrence with the determination that the project "may affect, but is not likely to adversely affect" bull trout (*Salvelinus confluentus*) and its designated critical habitat and "may affect, but is not likely to adversely affect" yellow billed cuckoo (*Coccyzus americanus*) in accordance with section 7(a)(2) of the Act, as amended (16 U.S.C. 1531 *et seq.*).

### Project Description

The proposed Project will occur within Yakima County, Washington. Specifically, near the City of Yakima in the Yakima River (River) floodplain between Selah Gap and Union Gap, commonly known as the Gap to Gap Reach. The purpose of the Project is to restore ecosystem process, structure, and function in the Gap to Gap Reach through levee setback, spur modification, and side channel restoration. The levee system has channelized the reach through the action area, leading to localized sediment aggradation/degradation and increased erosional forces which in turn impact in-stream habitat and levee integrity. Natural processes such as channel migration, development of side channels, and large woody material recruitment are

hampered within the action area due to the channel constraints, including levees, which limit channel-floodplain interaction. In addition to aquatic habitat, the levees also negatively impact adjacent riparian habitat by preventing overbank flooding and sediment deposition and by reducing hydrologic connectivity with the River.

Construction activities will be conducted in the dry where possible. Project components which may involve in-water work include side channel restoration, pit causeway construction, and culvert replacements. Spur removal and construction will require in-water work. In-water work activities will have a relatively small spatial-temporal footprint and will be conducted from October to February. Many potential in-water components can be conducted in isolation from the River, as these actions are designed to promote healthy floodplain activation and are above the ordinary high water mark.

Side channel restoration will involve excavation of approximately 100,000 cubic yards of alluvium and woody debris. The channel will be designed to inundate at the 2-year flow to relieve pressure on the adjacent bank levee and restore approximately 20 acres of side channel habitat. The side channel will improve water conductance to the Blue Slough channel.

Activities in the Blue Slough channel will include upgrading four undersized culverts and adding an automated headgate. Upgrading the culverts will bring more natural flow through Blue Slough and significantly improve passage for all native salmonids. The automated headgate is intended to prevent too much water from entering Blue Slough during high flow events. The headgate will remain open, closing only on rare occasions and culvert upgrades include replacement of downstream energy dissipater with a large pre-formed scour pool to prevent stranding and to allow salmonids downstream access to the culvert.

The spur removal will include three spurs upstream of Sportsman's Island which will restore natural flow to the river and encourage access to the island and its side channel habitat.

Construction of nine new spurs adjacent to Buchanan Lake is proposed to increase water surface elevations directing flow into the new channel through Sportsman Island and to reduce velocities. Construction and removal of spurs will be conducted from the shoreline by an excavator or similar machine and will result in noise and turbidity. BMPs will be employed to minimize impact to aquatic resources, including having a certified biologist on-site during construction.

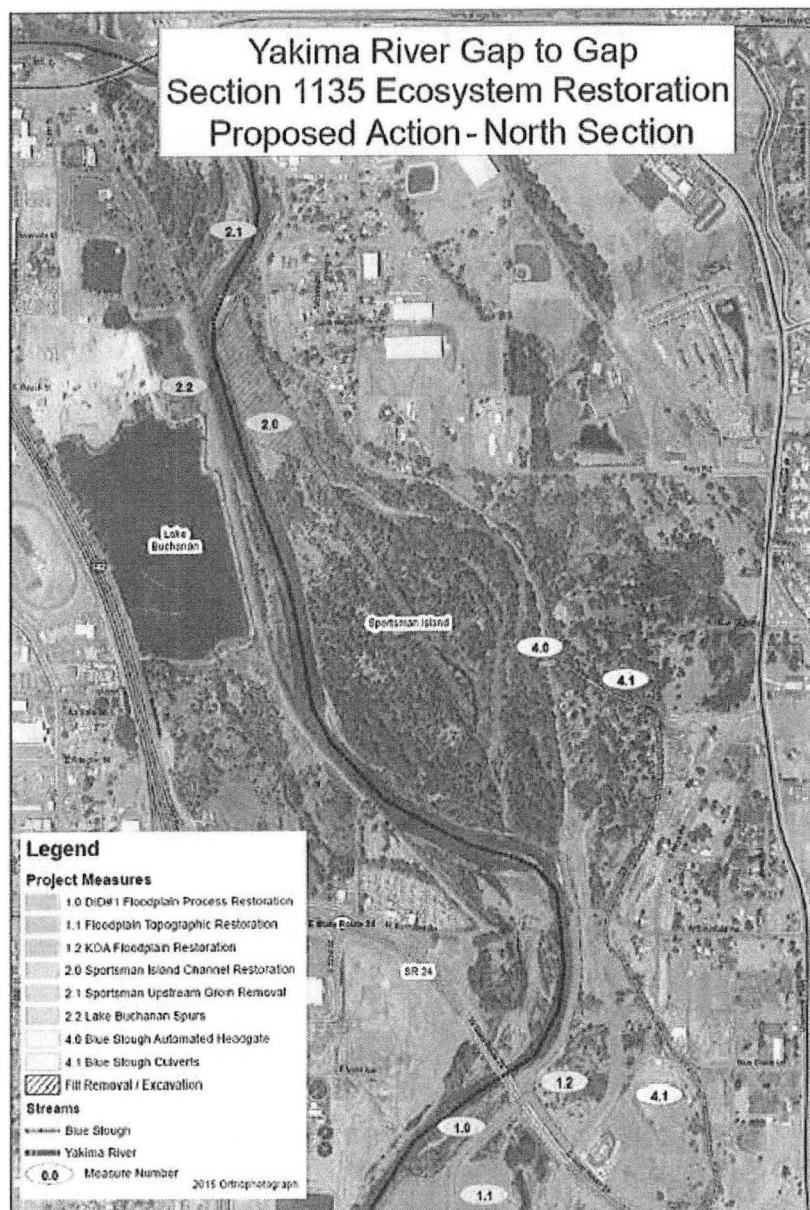


Figure 1. Depiction of project area.

### Bull Trout

A general decline in bull trout abundance across their range resulted in the listing of all populations in the Columbia River Distinct Population Segment (DPS) as threatened under the Endangered Species Act (ESA) in June of 1998 (63 FR 31647), followed by a coterminous United States listing in 1999 (64 FR 58910). The U.S. Fish and Wildlife Service (USFWS) has designated critical habitat for bull trout, previously listed under the ESA, in 32 habitat units (50 CFR Part 17).

The Recovery Plan for the Coterminous United States Population of Bull Trout (USFWS 2015) established four recovery actions; (1) protect, restore, and maintain suitable habitat conditions for bull trout that promote diverse life history strategies and conserve genetic diversity; (2) minimize

demographic threats to bull trout by restoring connectivity of populations where appropriate to promote diverse life-history strategies and conserve genetic diversity; (3) prevent and reduce negative effects of non-native fishes and other non-native taxa on bull trout; and (4) work with partners to conduct research and monitoring to implement and evaluate bull trout recovery activities, consistent with an adaptive management approach using feedback from implemented, site-specific recovery actions.

The mainstem Yakima River is designated critical habitat for bull trout for feeding, migration, and overwintering. Use of the mainstem Yakima River by fluvial bull trout is thought to be sparse. Only a few individual bull trout have been found in the mainstem Yakima River since 1990 (WDFW, USFWS). Although some bull trout originating from outside of the sub basin may traverse through this area, available data indicate that this is a rare occurrence (WDFW, USFWS).

The Project *may affect* the bull trout because:

- Feeding, migration, and overwintering habitat is present within the action area.
- Construction work will result in noise, vibration, and turbidity which may induce avoidance behavior.

The Project is *not likely to adversely affect* the bull trout because:

- In-water work will have a relatively small spatial-temporal footprint.
- There is a relatively low probability of bull trout presence within the action area.
- Comparable habitat is readily available through and around the action area.

#### Yellow Billed Cuckoo

The Project *may affect* the yellow billed cuckoo because:

- Work will occur in potential habitat for yellow billed cuckoo.
- Noise and loss of habitat could disturb yellow billed cuckoos.

The Project is *not likely to adversely affect* the yellow billed cuckoo because:

- Yellow billed cuckoos are extremely unlikely to be present in the action area because the last confirmed breeding records for this species in Washington State are from the 1930s, and it is likely the species is extirpated as a breeder.
- Tree removal will be conducted outside of the most likely period of yellow billed cuckoo migration in order to minimize impacts.

#### Project Effects

Effects of the proposed action are expected to include noise and vibration from machinery, temporary localized turbidity, and a temporary reduction in riparian vegetation. Bull trout designated critical habitat includes nine primary constituent elements (PCEs) which identify characteristics of the habitat necessary to sustain the essential bull trout life-history functions. The effects of the proposed action on critical habitat are evaluated in terms of these PCEs.

Removal of riparian vegetation may temporarily impact the food base, water temperature, and/or water quality, however, only a small portion of the riparian disturbance will occur directly

alongside the River. Much of the vegetation removal will result from channel restoration which is directed away from the shoreline (refer to Figure 1). The Project may negatively impact the following PCEs: abundant food base (PCE 3), temperature (PCE 5), and water quality (PCE 8). Due to the relatively small magnitude and duration of impacts, the overall negative effects to PCEs are considered insignificant. Conversely, the side channel and floodplain restoration will improve PCEs: seeps, springs and groundwater (PCE 1), abundant food base (PCE 3), complex habitats (PCE 4), temperature (PCE 5), substrate (PCE 6), and hydrograph (PCE 7). The net result of the proposed action will generate positive effects for PCEs. Effects on the remaining PCEs are not anticipated to occur as a result of the proposed Project.

Construction techniques, sequencing, and timing will minimize soil disturbance to the extent practical to reduce the generation of turbidity during connection of the new channels. Similarly, the design and implementation of the erosion-control and Stormwater Pollution Prevent Plan will incorporate best management practices such as installation of a silt fence, placement of staging areas in uplands, and revegetation of disturbed areas to further reduce the duration and magnitude of water quality impacts. Turbidity monitoring will ensure that the temporary disturbance to water quality does not reach significant levels (PCE 8).

The proposed action will yield long-term benefits for bull trout and its designated critical habitat within the Gap to Gap Reach of the Yakima River. The Project will reconnect approximately 320 acres of floodplain and restore approximately 20 acres of side channel habitat at the Sportsman's Park Island. Although bull trout presence is thought to be unlikely or very low, inconsequential avoidance behavior would be the anticipated response to Project disturbances by individuals which may be present.

#### Conservation Recommendations

Section 7(a)(1) of the Act directs Federal agencies to utilize their authorities to further the purposes of the Act by carrying out conservation programs for the benefit of endangered and threatened species. Conservation recommendations are discretionary agency activities to minimize or avoid adverse effects of a proposed action on a listed species or critical habitat, to help implement recovery plans, or to develop information.

In this instance, the Service requests requests information on any bull trout that may be observed during project activities.

#### Conclusion

The Project BA describes effects that may occur, but are deemed by the COE to be discountable or insignificant. The Service agrees that implementation of the Project will result in discountable effects to yellow billed cuckoo. The Service also agrees that Project implementation will result in insignificant effects to bull trout and its designated critical habitat. Therefore, the Service concurs with your determinations of "may affect, not likely to adversely affect" for the yellow billed cuckoo and the bull trout and its designated critical habitat based on the information provided in the BA and through email correspondence. Our concurrence is based on the Project being implemented as described in the BA and as stated in correspondences saved in the official record.

Evan R. Lewis

This concludes informal consultation pursuant to the regulations implementing the Act, 50 C.F.R. § 402.13. This Project should be reanalyzed if new information reveals effects of the action may affect listed or proposed species or designated or proposed critical habitat in a manner or to an extent not considered in this consultation; if the action is subsequently modified in a manner that causes an effect to a listed or proposed species or designated or proposed critical habitat that was not considered in this consultation; and/or, if a new species is listed or critical habitat is designated that may be affected by this Project.

If you have any questions or comments regarding this letter, please contact Robert Haltner at the Central Washington Field Office in Wenatchee at (509)665-3508, extension 1999, or via e-mail at [robert\\_haltner@fws.gov](mailto:robert_haltner@fws.gov).

Sincerely,

A handwritten signature in black ink, appearing to read "Eric V. Rickerson" followed by "For". The signature is fluid and cursive.

Eric V. Rickerson, State Supervisor  
Washington Fish and Wildlife Office

Cc: Melissa Leslie, COE

**From:** [Krupka, Jeff](#)  
**To:** [Leslie, Melissa L NWS](#)  
**Subject:** [EXTERNAL] Re: Yakima 1135 Ecosystem Restoration Project - FWCA Coordination  
**Date:** Wednesday, April 20, 2016 1:49:45 PM

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Hi Melissa. I reviewed the information you provided and considered the need to complete a Fish and Wildlife Coordination Act (FWCA) report. True, the language of the FWCA is broad so it is not clear whether a given project may require a FWCA report. Looking at what I think is a key aspect of this law, the FWCA requires that fish and wildlife are given "equal consideration" as other features of a water resource development. Since the purpose and need of the proposed action is essentially restoration for the benefit of fish and wildlife, I see no reason to require a FWCA report to provide you recommendations to benefit fish and wildlife. I think you have fully met the intent of the FWCA by the design of the project itself.

Please contact me if you have any questions. jk

Jeff Krupka, Supervisory Fish and Wildlife Biologist  
USFWS - Central Washington Field Office  
215 Melody Lane, Suite 103  
Wenatchee, WA 98801-8122  
509.665.3508 x2008 (tel)  
Blocked[www.fws.gov/wafwo/](http://www.fws.gov/wafwo/) <Blocked<http://www.fws.gov/wafwo/>>

On Tue, Apr 19, 2016 at 4:02 PM, Leslie, Melissa L NWS <[Melissa.L.Leslie@usace.army.mil](mailto:Melissa.L.Leslie@usace.army.mil)> <<mailto:Melissa.L.Leslie@usace.army.mil>> wrote:

Hi Jeff,

I'm following up on our conversation this afternoon regarding FWCA coordination on a restoration project in Yakima. The Corps has partnered with Yakima County to evaluate potential environmental restoration actions along the Yakima River between Selah Gap and Union Gap. The Yakima River ecosystem in this reach has been degraded over time as a result of Federally-constructed flood control works on both banks of the river dating back to the 1940's. The purpose of the study is to evaluate the feasibility of ecosystem restoration actions within this reach and to identify a recommended plan to be implemented to address environmental degradation. The recommended plan will encompass restoration of lost riparian and aquatic habitat within the Gap to Gap Reach.

The initial list of measures consists of the potential actions below. Also see attached pdfs for locations and 10% level of design. The final plan will likely consist of some combination of the following measures:

Measure #1 - Levee Realignment and associated measures to reduce the risk of headcutting upstream from possible gravel pit capture

- 1A - Diking District #1 Levee Removal and Setback Construction
- 1B - Partially Fill Pit #1/Causeway Construction
- 1C - Fill Pit #2/Causeway Construction
- 1D - Partially Fill Pit #3/Causeway Construction
- 1E - Regrade of Newland Pits Adjacent Ground and Bar
- 1F - Remove Cross-Dike to Floodplain Grade, Leave Existing Toe
- 1F - KOA Remnant Levee Removal
- 1G - Upstream Groin Removal
- 1G - Pilot/Conveyance Channels @ Sportsman
- 1G - Spurs along Buchanon

Measure 2 - Automated Headgate for Blue Slough

Measure 3 - Blue Slough Culvert Replacement and Causeway Removal

Measure 5 - Lower Blue Slough Reconnection  
Measure 6 - Pilot Channels at WSDOT  
Measure 7 - Greenway Trail Setback and Riprap Removal  
Measure 8 - Spring Creek Reconnection  
Measure 9 - Nob Hill Levee Realignment

At this time I am seeking your input on this project specifically under FWCA and would like to know how you prefer to coordinate on this project. Please let me know if you have any questions or would like further information.

Thank you,  
Melissa

---

Melissa Leslie  
Biologist  
U.S. Army Corps of Engineers  
Seattle District  
206.764.6587  
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**DRAFT Clean Water Act Section 404 Analysis**

**Yakima River Gap to Gap – Ecosystem Restoration Project**

**Yakima, Washington**

**Prepared by:**

**U.S. Army Corps of Engineers  
Seattle District  
Environmental and Cultural Resources Branch**

**October 2016**



**US Army Corps  
of Engineers ®  
Seattle District**

## **1.0 INTRODUCTION**

The purpose of this document is to record the U.S. Army Corps of Engineers (Corps) compliance evaluation of the Yakima River Gap to Gap Ecosystem Restoration Project on the Yakima River, Yakima County, Washington, pursuant to the Clean Water Act (CWA), and the General Regulatory Policies of the Corps. Specifically, Section 404 of the CWA requires an evaluation of impacts for work involving discharge of fill material into the waters of the U.S., and evaluation guidance can be found in the CWA 404(b)(1) Guidelines [40 CFR §230.12(a)]. The General Regulatory Policies of the Corps of Engineers [33 CFR §320.4(a)] provide measures for evaluating permit applications for activities undertaken in navigable waters.

Attachment A provides the specific Corps analysis of compliance with the CWA Section 404(b)(1) and the General Regulatory Policy requirements.

## **1.0 PROJECT BACKGROUND**

The proposed project is being pursued under the Authority of Section 1135 of the Water Resources and Development Act of 1986, as amended (Section 1135). Section 1135 provides the Corps the authority to evaluate potential modifications to existing Corps' projects for the purpose of improving the environment in the public interest. Measures at off-project locations that have been affected by the construction or operation of the project can be undertaken, if such measures do not conflict with the authorized project purpose.

Projects carried out under the Section 1135 authority of the Continuing Authorities Program must demonstrate a link between the degraded environment and a Corps project. Severe flooding in 1933 prompted the authorization and construction of the Yakima Authorized Flood Control Project levees (Yakima Authorized) along the Yakima River to limit future flood damages near the City of Yakima. Construction of the Yakima Authorized project levees was authorized by the Flood Control Act of 1938 and allowed for the protection of the City of Yakima, Washington by levees set forth in House document 579 of the seventy-fifth Congress.

Beginning in 1947, the Corps of Engineers constructed nearly 8.6 miles of levees that have since been modified, repaired, and expanded. Repairs conducted by the Corps of Engineers in 1949, 1996, 2009 and 2012 addressed damages caused by large events in the basin. Since the original construction, non-Federal entities, such as Diking Improvement District #1, have expanded the Federal system and increased protection from flood damages both upstream and downstream.

## **2.0 PROJECT NEED**

The need for the proposed Federal action arises from the significant degradation of natural processes that sustain the ecological functions of the river channel and floodplain habitat of the Gap to Gap reach of the Yakima River. This reach has the greatest potential for restoring fish habitat for ESA-listed fish in a basin that is impacted in various ways by human activity, including presence of Federal and non-Federal levees that disconnect the river from its historic floodplain, managed, non-normative hydrology, and agricultural runoff (nonpoint source pollution).

## **3.0 PROJECT PURPOSE**

The extent and function of the Gap to Gap reach of the Yakima River and its floodplain have been reduced by infrastructure and urban development adjacent to the cities of Yakima and Union Gap. Biological resources, including salmonid species listed under the Endangered Species Act, depend on a connected river and floodplain. The degradation and loss of aquatic habitat, especially side channels, are significant limiting factors for Endangered Species Act (ESA) -listed steelhead and bull trout, as well as other

salmonids and Pacific lamprey. In addition to aquatic habitat, the levees also negatively impact adjacent riparian habitat for birds and mammals by preventing overbank flooding and sediment deposition, and by reducing hydrologic connectivity with the river. This Yakima River Gap to Gap Ecosystem Restoration Project is proposed to improve conditions for important ecological resources that effect the Yakima Basin.

#### 4.0 PROPOSED ACTION AND ALTERNATIVES

Multiple alternatives were considered including the No-Action, Alternative #5, and Alternative #9. A preliminary evaluation has been performed on the three alternatives:

- a. **No Action:** Under the No Action plan, the Corps will not participate in developing solutions for environmental restoration within the Gap to Gap Reach. The reach will continue to degrade as a result of the existing levees systems. It is expected that the degradation will continue at its current pace because expansions to the current levee configurations are not expected at this time. The results of the No Action alternative reflect the future without project conditions for the study area if no action was taken by the Corps.
- b. **Alternative #5:** This alternative includes levee removals, spur dike removals, floodplain topographic restoration, side channel construction, hydrologic enhancement of a disconnected floodplain channel, replacement of barrier culverts, and wetland reconnection. Primarily through removal of fill and replacement of a headgate and of undersized culverts, hydrologic and habitat connectivity is restored between a stretch of the Yakima River in the Gap to Gap Reach and over 320 acres of its historic floodplain. Work will be completed in four areas, in order of size: the DID#1 Floodplain area, Sportsman Island, Blue Slough and Spring Creek.
- c. **Alternative #9:** This alternative includes the measure in Alternative #5 plus a four more measures. Additional areas where work will be implemented include Nob Hill, Lower Blue Slough, and the right bank of the Yakima River.

The preferred alternative for the proposed work is Alternative #5 (Fig. 1). Construction is anticipated to occur between **XXX DATES XXXX** and all in-water work will be completed during the fish window for this area (1 June – 15 September).

Measure 1.0 consists of removing 1.7 miles (all) of the DID 1 levee along its present alignment to restore hydrology and natural processes to the historic floodplain. The levee will be rebuilt eastward to maintain the existing level of protection presently enjoyed by a state road (SR 24), a county road (Riverside Road) and nearby homes and businesses. As shown in **Error! Reference source not found.** levee armor removal associated with this measure will reduce the total amount of hard armoring in the 10 mile long Gap to Gap reach by 8%. Approximately 300275 acres of floodplain will be reconnected to the river from this measure alone, which represents the single most beneficial action proposed as part of this project. An additional several hundred acres downstream could be directly benefited as a result of improved surface hydrology conditions; incidental downstream benefits are not included when conducting the cost-benefit analysis for this study.

Measure 1.1 is sited in the historic floodplain being connected to the river by Measure 1.0, just south of the SR 24 Bridge on left bank of the Yakima River. The area is characterized by three large decommissioned gravel pits (the Newland Pits). The measure consists of the following three project actions: 1) Removal of aggraded point bar material that has resulted from the fixed meander downstream of the SR 24 Bridge. This action, when implemented with Measure 1, will allow re-initiation of normal

channel migration processes. It will also distribute energy more evenly across the channel, and reduce the potential for immediate avulsion into the pits. 2) Place excavated material into the three pits strategically to reduce the risk and effect of floodplain pit capture and any associated headcutting upstream. 3) Remove remnant gravel pit spoils from the floodplain to allow the river more conveyance and wetted area within the floodplain area reconnected through Measure 1 and deposit that material in the former pits. These actions allow for a more active floodplain, lower flood elevations, and increased habitat within the reach, while ameliorating risk associated with potential pit capture by the main channel.

Measure 1.2 is located on the left bank between SR 24 on the downstream end and Sportsman's Park on the upstream end. In 2012, a large portion of the Federal levee was rebuilt along a setback alignment under PL 84-99; approximately 1,500 feet of remnant levee was left in place, impairing riparian process and isolating the river from about 15 acres of floodplain. This measure will remove the remnant portion of levee, reconnecting the river with its historic floodplain. It will also remove an approximately 800-foot spur dike isolating this area from the DID #1 floodplain area downstream. This measure will be dependent on Measure 1, which includes new levee construction tying into the south end of the Federal levee; as such this will not induce flooding offsite. Removal of the remnant levee and the spur dike at SR 24 will allow water to flow freely into the restored DID #1 floodplain area. Removed fill will be used as borrow material for the levee rebuild included as part of Measure 1. The Federal levee and new SR 24 Bridge and approach were designed to accommodate the increased erosion and scour risk associated with this restoration effort. A buried grade control sill will be installed to help mitigate the risks of floodplain overflows avulsing into the Newland Pits. Riparian revegetation will consist of natural recruitment from adjacent stands and seed sources.

Measure 2.0, located at the upper end of the project footprint, will include excavation of a relatively straight 3,400 long side channel requiring removal of approximately 100,000 cubic yards of deposited material and woody debris. Excavated material from this channel will be contributed towards Measure 1.2. A large channel mouth will be constructed at the head of the island that will then funnel into a 100-foot wide channel that will tie in to an existing channel towards the downstream end of the island. Construction of this side channel directly restores 20 acres of side channel habitat, reconnects the upstream and downstream ends of the island allowing for additional conveyance to mitigate risk associated with potential downstream pit capture and headcutting, creates a more even distribution of stream power across this leveed reach (improving spawning conditions), and reconnects various side channels along the alignment. Introduction of hydrology to the interior of the island will benefit the entire 262 acres of the island over the period of analysis through increased frequency of inundation. The as-built channel will be inundated at the 2-year flow which will relieve pressure on the adjacent right bank levee by redistributing flow away from the levee and reducing flood stages.

Measure 2.1 will remove the three most downstream groins to restore the natural flow pattern of the river and encourage access to the island and its side channel habitat. Groin removal will also allow more water to be funneled into the Sportsman's Park channel – Measure 2.0. Measure 2.2 proposes a series of low spurs along the existing right bank federal levee adjacent to Buchanan Lake to increase local water surface elevations directing flow into the new channel excavated through Sportsman island (measure 2.0) and reduce velocities and stream power in the main channel at the base of the right bank Federal project levee which separates the main stem from Buchanan Lake. The spurs will be located at two sites along the levee, spaced 120 feet apart, and will be constructed of large riprap.

Measure 4.0 includes replacement of the headgate with an automated structure that will allow floodplain managers to maintain a normative hydrograph in the slough without increasing flood risk. Regular flows in the slough will make it useable by the various ESA-listed salmonids and other native fish species that inhabit the reach. Benefits will accrue to approximately 12 acres of this historic channel as a result of this hydrologic restoration measure. Measure 4.1 will upgrade all of the culverts less than 12 feet wide (4 culverts) to 6 feet wide (to match the span of 2 of 3 of the largest culverts). Upgrading the undersized culverts significantly improves passage for all native salmonids and life stages.

Measure 7.0 will reconnect Spring Creek by removing compacted road bed from the mouth of Spring Creek, a groundwater fed stream, providing access to rare cold water off-channel habitat for listed fish species. This hydrologic restoration measure will directly benefit approximately 14 acres

The measure construction footprints are depicted below in Figures 1 and 2.

# Yakima River Gap to Gap Section 1135 Ecosystem Restoration Alternative 1 - North Section

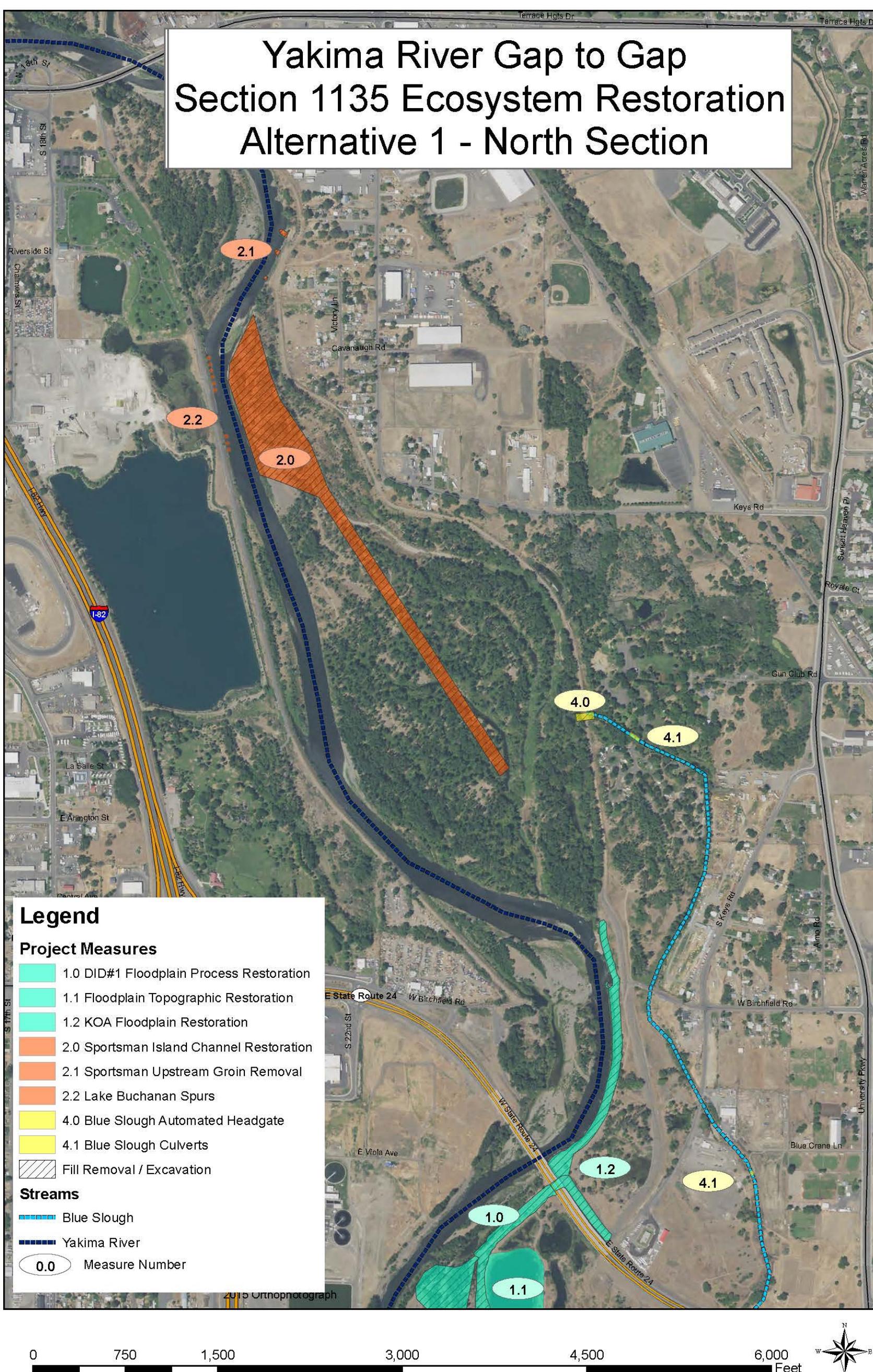


Figure 1. Recommended Alternative – North Portion

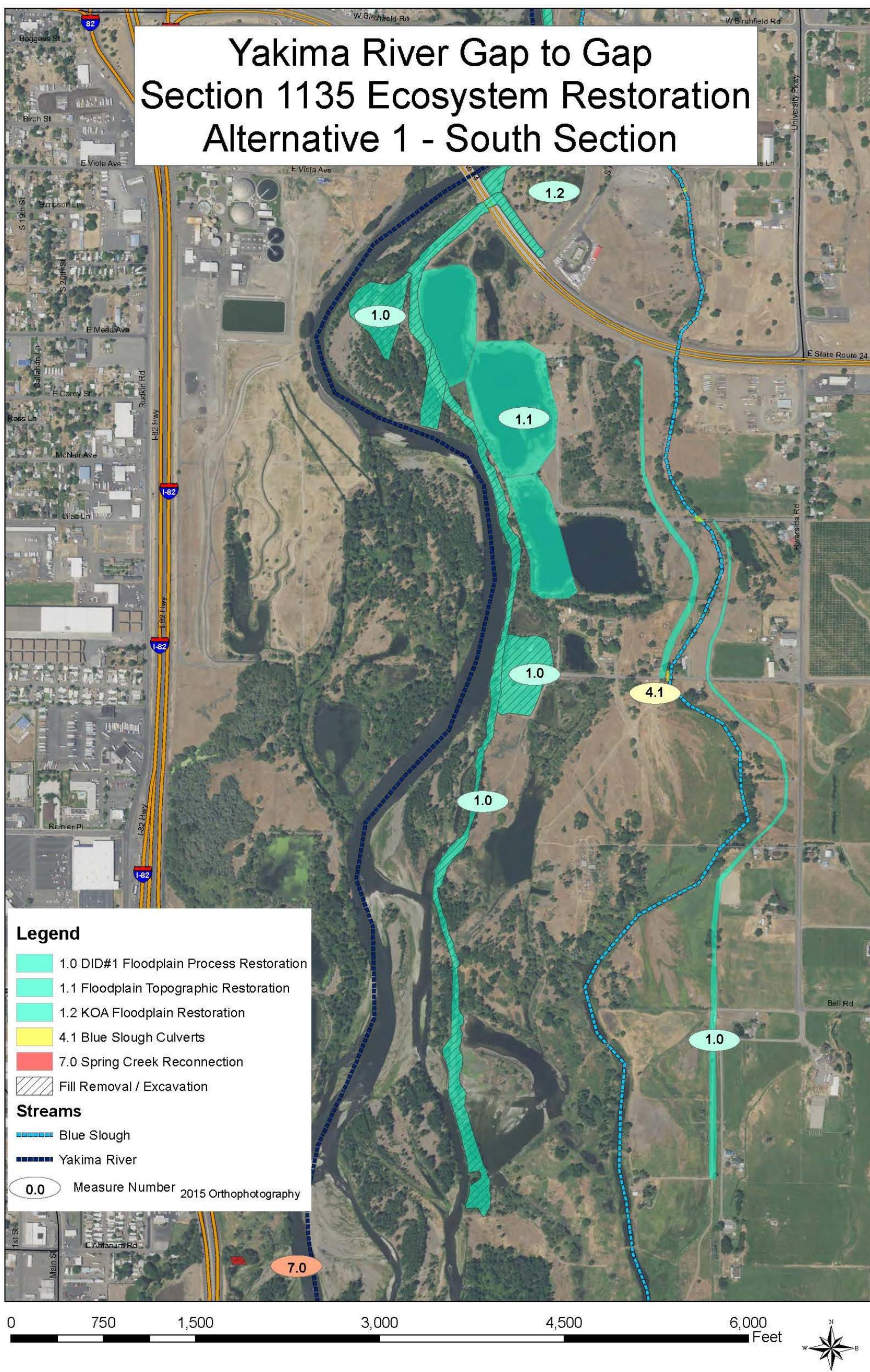


Figure 2. Recommended Alternative – South Portion

## **Potentially Adverse Effects (Individually or Cumulatively) on the Aquatic Environment**

### **a. Effects on Physical, Chemical, or Biological Characteristics of the Aquatic Ecosystem**

There will be a pulse of sedimentation following the opening of the new Sportsman Island side channel, resulting in short-term turbidity increases as the streambed adjusts to the new flow. Small amounts of turbidity may be generated during the levee removal and the installation of ELJs. Turbidity monitoring will occur during these sediment generating activities. Localized shifting of sediments could continue sporadically after construction as the new and existing side channels adjust. High flows during the winter and spring following construction may continue to mobilize sediments in the project area, potentially contributing to small increases in turbidity over that normally seen during high flow events.

The majority of the excavation work will be completed in the dry by completing much of the excavation prior to removal of the levee and avoiding connection to the existing channel until the project is complete. Connections to the existing channel and any other in-water work will be completed during the fish window. The fish window is estimated at 1 June to 15 September.

Setting back the DID#1 levee (and associated pit filling and upstream improvements) will significantly alter the hydrology, hydraulics, and resulting habitat within the existing river channel, floodplain, and restored area within the project reach and for a significant distance upstream and downstream. The diversion of flow into the restored area will reduce the discharge, velocity, depth and shear stress in the main channel, but increase them in the restored area and in connected floodplain areas downstream of the project. The diversion of flow will restore natural erosional, depositional and successional processes important for creating and sustaining riparian habitat such as pool riffle complexes, bars, logjams, islands, shallow water, and deep water and off channel wetlands. Flow into and through the Newland ponds will restore cold water habitat and native fish.

### **b. Effects on Recreational, Aesthetic, Historical, and Economic Values**

Recreational opportunities will be improved in the project area. The restored floodplain at the DID1 site will improve fish and wildlife habitat, enhancing the recreation and aesthetic experiences available to visitors. Also, the realigned DID1 levee will be available for local residents to walk, run, and bird watch.

Short-term disruptions to traffic and/or recreation will occur during construction. Access to Sportsman's Park and the DID1 levee will be limited to visitors until construction completion. During construction activities, vehicles and equipment associated with the project may disrupt local traffic. This increase in traffic will be localized and of short duration, with no long term impacts. A traffic control plan will be developed and implemented to minimize traffic impacts during construction. Realignment of the DID1 levee will retain the existing level of flood protection to residences, businesses and associated public infrastructure. There will be no impacts to the WWTP during or after construction completion. No significant short or long-term effects to transportation, utilities, and public services will occur from the implementation of the project.

### **ADD CULTURAL RESOURCES**

### **c. Findings**

There will be no significant adverse impacts to aquatic ecosystem functions and values. The site is likely to increase the amount of wetland in the reach. Based on the analysis of the proposed work, the environmental restoration project not have a significant environmental impact.

## **5.0 ALL APPROPRIATE AND PRACTICABLE MEASURES TO MINIMIZE POTENTIAL**

## **HARM TO THE AQUATIC ECOSYSTEM**

### **a. Impact Avoidance Measures**

Three project alternatives have been proposed to select the best alternative for minimizing cost and impact to the environment while generating gains in habitat value and ecosystem function. The proposed project action was selected because it is a complete project offering significant benefit to the ecosystem in and of itself, and because it can be more efficiently implemented under the CAP Section 1135 program. Potential impacts to aquatic animals and fish will be avoided by constructing the new Sportsman Island side channel in the dry, delaying connection to the Yakima River. Any in-water work will be conducted during the designated fish window, June 1 to September 15.

### **b. Impact Minimization Measures**

The Corps will take all practicable steps during construction of the project to minimize impacts to aquatic and terrestrial resources. Contingencies will be in place if any of the water quality protection measures fail to achieve their intended function. The minimization measures will be as follows:

- Best management practices (BMPs), such as stormwater runoff prevention, will be used to ensure that no unnecessary damage to the environment occurs.
- In-water work will only occur during June 1 to September 15 work window.
- During side channel construction, appropriate turbidity control measures (temporary coffer dam, silt curtains, or similar) will be used to isolate construction from the Yakima River in order to minimize turbidity impacts.
- All required de-watering activities during construction will use appropriate devices (i.e. pumps, sand bags, sumps). All water removed from the site will be discharged in a vegetated upland location, a de-siltation basin, or location that will not incur damage due to water discharge.
- Drive trains of equipment will not operate in the water.
- All equipment will be cleaned prior to in-water construction work.
- No refueling will occur near rivers, streams, or wetlands.
- Construction equipment shall be regularly checked for drips or leaks.
- Construction equipment will include dust suppression methods to minimize airborne particulate matter that will be created during any ground disturbing activities that could create dust. Additionally, all equipment and vehicles will be required to be kept in good operating condition to minimize exhaust emissions. Standard practices will be used to control fugitive dust during the construction phase and during daily operations and maintenance of the proposed project

### **c. Compensatory Mitigation Measures**

The project is an ecosystem restoration project, with the overall effect of enhancing floodplain, wetland, and aquatic habitat and increasing their total area in the Gap to Gap reach of the Yakima River, which offsets any wetland impact. Access roads and staging areas will be located as far from wetlands as is practicable and will be re-planted and replaced to function in-kind after the project is completed.

### **d. Findings**

The Corps has determined that all appropriate and practicable measures have been taken to minimize potential harm to the environment.

## **6.0 OTHER FACTORS IN THE PUBLIC INTEREST**

- **a. Fish and Wildlife.** The Corps has found that there are minimal impacts to salmonid species, including their critical habitat. The project is being designed to provide long-term benefits to the species, although minor short-term negative impacts could occur as a result of the construction effort. Wildlife could be

temporarily displaced from the site due to increased noise during construction. Overall, fish and wildlife will benefit from the improved function of the site.

**b. Water Quality.** The Corps has concluded that this project will not violate Washington State Water Quality Standards. There will be a pulse of sedimentation following the opening of the new Sportsman Island side channel, resulting in short-term turbidity increases as the streambed adjusts to the new flow. Small amounts of turbidity may also be generated during the DID#1 levee removal. Turbidity monitoring will occur during these sediment generating activities. Localized shifting of sediments could continue sporadically after construction as the new channel heals and adjusts. High flows during the winter and spring following construction may continue to mobilize sediments in the project area, potentially contributing to small increases in turbidity over that normally seen during high flow events. During inlet/outlet construction and watering of the new channel, appropriate turbidity control measures (temporary coffer dam, silt curtains, or similar) will be used to isolate construction from the river and to minimize turbidity impacts. Long-term impacts of the project will be beneficial for water quality through the increased connection to the floodplain and improved riparian habitat.

**c. Historical and Cultural Resources**

ADD CULTURAL

**e. Environmental Benefits.**

The project will reconnect over 320 acres of floodplain and restore natural riverine processes beneficial to native fish through the realignment of the DID#1 levee. Pools, riffles, boulders, logjams, side channels, wetlands and other features will be reconnected with the floodplain and the river. Realignment of the levee will improve fish habitat by giving the river channel the opportunity to migrate and promote bar, island, and side channel formation.

This project will also create and restore approximately 20 acres of side channel habitat at the Sportsman's Park Island that is currently lacking in this reach of the Yakima River. Side and back channels will have lower water velocities during floods, providing valuable fish habitat, and act as storage areas for sediment in the watershed. As these channels experience flooding, erosion, sedimentation, and debris recruitment the size and position of the channels, including the mainstem river will change. Maturation of native tree and shrub species in the restored riparian and floodplain habitat will contribute to the long-term recruitment of large wood into the river to further promote and maintain channel processes.

Restoration of flow to Blue Slough will restore surface water hydrology to 2 miles/12 acres of relic channel that currently is only wet seasonally when ground water elevations are high. Replacing the existing culvert in-kind and upgrading the slide gate to an automatic flow controlled gate will ensure the flows do not exceed thresholds that will result in downstream flooding. Upgrades to the culvert entrance include removal of accumulated sediment and debris, installation of a trash rack, and installation of flow control weirs to ensure adequate head at low flows is available. At the outlet the existing energy dissipater will be replaced with a large pre-formed scour pool lined with riprap or large river cobbles to dissipate energy at the culvert outlet, and provide resting areas to allow adult salmonids access to the culvert. A flow control weir will be added at the outlet of the scour pool to partially backwater the culvert outlet to facilitate upstream passage at low flows by juvenile salmonids.

Additionally, replacement of all undersized Blue Slough culverts less than 12 feet will significantly improve fish passage for all species and life stages. The existing culvert at SR 24 while wide, is also long. Modeling suggests that hydraulic conditions at the outlet could be adverse under some flow conditions. Detailed channel survey data will be collected during the design phase to better understand if this is an artifact of

limited data or something that needs more attention. Due to the existing constriction at the entrance culvert, upstream juvenile passage is only expected during low flow conditions when the head drop through the culvert is minimal. At all other times downstream passage should be adequate, and upstream passage to the headgate will be significantly improved.

Currently, the outlet of Spring Creek consists of an approximate 3 foot waterfall into a former gravel pit. Thus, valuable spawning and rearing habitat is disconnected from the Yakima River, preventing fish access to the fresh, cold water of Spring Creek. The reconnection of the Spring Creek will restore access to rare cold water off-channel fish habitat.

## **9. CONCLUSION**

The Corps finds that this project is within the public's interest and complies with the substantive elements of Section 404 of the Clean Water Act.

## Attachment A

### Clean Water Act 404(b)(1) Evaluation [40 CFR §230] Permit Application Evaluation [33 CFR §320.4]

#### 404(b)(1) Evaluation [40 CFR §230]

#### Potential Impacts on Physical and Chemical Characteristics [Subpart C]:

##### **1. Substrate [230.20]**

The construction will move substrate around within the project area. The material excavated to create the Sportsman Island side channel and DID#1 floodplain topographic restoration will be reused on site to fill existing gravel pits. This will allow for a more active floodplain, lower flood elevations, and increased habitat within the reach, while ameliorating risk associated with potential pit capture by the main channel. Additionally the material excavated for the DID#1 levee removal will be reused in the construction of the realigned levee. No significant change in substrate will occur.

##### **2. Suspended particulates/turbidity [230.21]**

Minimal turbidity is expected during construction. Best management practices (BMPs) for sediment control will be used throughout construction to minimize any potential turbidity issues. There will be a pulse of sedimentation following the opening of the new side channel, resulting in short-term turbidity increases as the streambed adjusts to the new flow. Small amounts of turbidity may also be generated during the levee removals. Turbidity monitoring will occur during these sediment generating activities. Localized shifting of sediments could continue sporadically after construction as the new stream and floodplain heals and adjusts. High flows during the winter and spring following construction may continue to mobilize sediments in the project area, potentially contributing to small increases in turbidity over that normally seen during high flow events. During inlet/outlet construction and watering of the new channel, appropriate turbidity control measures (temporary coffer dam, silt curtains, or similar) will be used to isolate construction from the river and to minimize turbidity impacts. All “in-water” construction work will take place during the established fish window (June 1 through September 15).

##### **3. Water [230.22]**

The work is not expected to add any nutrients to the water that could affect the clarity, color, odor, or aesthetic value of the water, or that could reduce the suitability of the Yakima River for aquatic organisms or recreation. Long-term impacts of the project will be beneficial for water quality through the increased connection to the floodplain and improved riparian habitat. The reconnected floodplain and associated wetlands will remove nutrients, suspended sediment, metals, and bacteria and help moderate the temperature of the water. Plants will filter receding floodwaters, trapping fine-grained sediments and capturing pollutants. Fecal coliform bacteria adsorbed to particulates will be retained in the onsite wetlands and floodplains, promoting bacteria die-off since many of the microorganisms associated with fecal matter cannot survive for long periods of time without a host organism (Hemond and Benoit 1988, Johnston et al., 1990). The increased floodplain connections and inundation will also result in increased groundwater recharge and subsequent discharge that could provide cooler water to the river during low flows.

##### **4. Current patterns and water circulation [230.23]**

The purpose of the ecosystem restoration project is to restore natural processes of current patterns and circulation in the Yakima River that have been degraded due to historical levee construction. Setting back the DID#1 levee (and associated pit filling and upstream improvements) will significantly alter the hydrology, hydraulics, and resulting habitat within the existing river channel, floodplain, and restored area within the project reach and for a significant distance upstream and downstream. The diversion of flow into the restored area will reduce the discharge, velocity, depth and shear stress in the main channel, but increase them in the restored area and in connected floodplain areas

downstream of the project. The diversion of flow will restore natural erosional, depositional and successional processes important for creating and sustaining riparian habitat such as pool riffle complexes, bars, logjams, islands, shallow water, and deep water and off channel wetlands.

Restoration of flow to Blue Slough will restore surface water hydrology to 9,200 lineal feet of relic channel that is only wet seasonally when ground water elevations are high. By replacing the existing culvert and headgate on Blue Slough, flow frequency, duration, and depths will be increased significantly in the slough. By replacing undersized culverts downstream of the headgate, connected channel length will increase and habitat restored can be accessed for spawning and rearing (connectivity). Because flows will be controlled, the frequency of flood disturbance will not be high, however seasonal inundation of near bank vegetation will occur more frequently.

#### **5. Normal water fluctuations [230.24].**

None of the components of this project will affect the hydrologic regime of the Yakima River. Flow is regulated by the five Yakima Project reservoirs in the upper basin operated by the USBR for agricultural flow augmentation and for flood control beginning in the early 1900s. However, the restoration strategy removes engineered hard points and obstructions to flow in the Gap to Gap reach and allows the river to access previous floodplain channels and riparian areas. The river is then allowed to perform geomorphic work to modify the floodplain topography through erosion, deposition, large wood recruitment, etc. Due to the topographic gradient between the river and restored area, the river is expected to quickly reoccupy disconnected channels and swales within the restored area, creating a large increase in connected aquatic habitat in a short time period.

The Sportsman's Channel area has two purposes – to help spread out the expected down cutting caused by lowering flood water surface elevations near SR 24 (caused by DID 1 levee removal and setback), and to restore side channel habitat degraded by historical channel improvement and levee works. The constructed side channel will divert up to half the river flow after the river begins to erode the channel banks and bed. Due to the large amount of trees along the banks and straight channel alignment, bank erosion is expected to occur which will recruit large wood to the channel, initiating erosion, deposition and formation of meanders, logjams, and pool-riffle sequences.

The Blue Slough projects are intended to provide a near-permanent surface water supply (and thus aquatic habitat) to a large, isolated relic channel that currently flows ephemerally when groundwater elevations are above the bottom of the channel. The existing diversion culvert will be replaced in kind, and the inlet and outlet works upgraded to provide reliable performance and flow control. The flow rate in the channel will be much higher than at present but much lower than the flows that formed the channel prior to being disconnected from the river by levee construction, which indicates that the Slough will not be dynamic once surface water hydrology is restored.

#### **6. Salinity gradients [230.25]**

No effect to salinity gradients will occur.

### **Potential Impacts on Biological Characteristics of the Aquatic Ecosystem [Subpart D]:**

#### **1. Threatened and endangered species [230.30]**

No adverse impact to terrestrial animals or plants are expected with this project. Construction of the project will occur during the fish window to limit impacts on listed salmonids. The project is designed to improve long-term conditions for listed salmonids and other wildlife by increasing floodplain connection, creating side channel habitat, and improving riparian habitat.

#### **2. Fish, crustaceans, mollusks, and other aquatic organisms in the food web [230.31]**

Fish, crustaceans, mollusks, and other aquatic organisms may be temporarily impacted by small

turbidity increases. The long-term improvements to the project site are expected to benefit aquatic organisms.

**3. Other wildlife [230.32]**

Wildlife in the vicinity of the project are expected to be acclimated to human presence and noise as the project area is adjacent to residential, agricultural areas, and local access roads. Birds and other wildlife may be temporarily displaced due to increased noise and presence of equipment. Long-term benefits to wildlife include improved riparian conditions and a greater diversity of habitat.

**Potential Impacts on Special Aquatic Sites [Subpart E]:**

**1. Sanctuaries and refuges [230.40]**

The proposed and completed actions will have no effect on sanctuaries and refuges.

**2. Wetlands [230.41]**

Based on the USFWS National Wetland Inventory (NWI) maps, there is an assemblage of different wetland types on the DID#1 portion of the site. All work to remove the DID#1 levee will occur in the footprint of the levee prism, thus no impacts to wetlands will occur. The current design path of the realigned levee appears to avoid impacts to the various segmented wetlands and Blue Slough. As design progresses, the alignment will be field verified to ensure wetland and vegetation impacts are avoided or minimized to the greatest extent practicable.

**3. Mud flats [230.42]**

No mud flats are present at the project site; therefore, the proposed and completed action will have no effect on mudflats.

**4. Vegetated shallows [230.43]**

No vegetated shallows are present at the project site; therefore, the proposed and completed action will have no effect on vegetated shallows.

**5. Corral reefs [230.44]**

Not applicable.

**6. Riffle and pool complexes [230.45]**

For the Sportsman Island side channel construction and spur dike removal, no LWD structures, pool riffle sequences, or bioengineering of streambanks will be included as high flows and natural processes are expected to rapidly sculpt the banks and bed of the side channel, adding complexity (sinuosity, large wood, pool-riffle sequences, bars, side channels) that will be initially absent from the as-built channel.

The diversion of flow into the reconnected DID#1 floodplain will restore natural erosional, depositional and successional processes important for creating and sustaining riparian habitat such as pool riffle complexes, bars, logjams, islands, shallow water, and deep water and off channel wetlands.

**Potential Effects on Human Use Characteristics [Subpart F]:**

**1. Municipal and private water supplies [230.50]**

The proposed and completed action will have no effect on municipal or private water supplies.

**2. Recreational and commercial fisheries [230.51]**

Recreational opportunities will be improved in the project area. The restored floodplain at the DID#1 site will improve fish and wildlife habitat, enhancing the recreation and aesthetic experiences available to visitors. Also, the realigned DID1 levee will be available for local residents to walk, run, and bird watch

**3. Water-related recreation [230.53]**

The proposed and completed action will have no effect on water-related recreation.

**4. Aesthetics [230.53]**

Aesthetics are expected to change slightly at the DID#1 and Sportsman Island sites due to the reconnection of the area to the floodplain and side channel creation.

**5. Parks, national and historic monuments, national seashores, wilderness areas, research sites and similar preserves [230.54]**

Not applicable.

**Evaluation and Testing [Subpart G]:**

**1. General evaluation of dredged or fill material [230.60]**

The Sportsman Island channel will require excavation of a relatively straight 3,400 long side channel requiring removal of approximately 100,000 cubic yards of deposited material and woody debris. Excavated material from this channel will be contributed towards Measure 1.2

Excavated material that is unsuitable for levee construction will be strategically placed into the three decommissioned gravel pits to reduce the risk and effect of floodplain pit capture and any associated headcutting upstream.

**2. Chemical, biological, and physical evaluation and testing [230.61]**

No soil sampling is required as no contamination is known or expected. Turbidity monitoring will be completed as necessary to ensure compliance with state water quality standards during construction.

**Actions to Minimize Adverse Effects [Subpart H]:**

**1. Actions concerning the location of the discharge [230.70]**

The materials to be discharged (levee material and topographic restoration material) are clean and the materials to be excavated will be reused on site. Staging areas will be located in uplands.

**2. Actions concerning the material to be discharged [230.71]**

All of the borrow material required for new setback levee construction will be obtained from demolition activities associated with this ecosystem restoration project. For levee embankment locations requiring riprap armor, it is assumed that demolition of several existing features will provide more than the necessary material needed. Sources of riprap may include Sportsman Groin Removal, KOA Levee Removal, Cross Dike Removal, and DID#1 Levee Removal.

**3. Actions controlling the material after discharge [230.72]**

Turbidity monitoring will occur during sediment generating activities and BMPs will be in place to limit the impact to the river. Localized shifting of sediments could continue sporadically after construction as the new side channel heals and adjusts. High flows during the winter and spring following construction may continue to mobilize sediments in the entire project area, potentially contributing to small increases in turbidity over that normally seen during high flow events.

**4. Actions affecting the method of dispersion [230.73]**

Moving the DID#1 levee away from the river channel to the floodplain will reduce risks of levee failure due to toe erosion. Setting back the levee reduces flood elevations and loading at the toe. Reconstructing the levee to modern standards combined with above reduces risk of levee failure and flood risk. The diversion of flow into the floodplain will restore natural erosional, depositional and successional processes important for creating and sustaining riparian habitat such as pool riffle complexes, bars, logjams, islands, shallow water, and deep water and off channel wetlands.

**5. Actions related to technology [230.74]**

The technology used in the proposed project is considered acceptable for this scope of work. Best management practices will be used, including drive trains of equipment will not operate in the water, all equipment will be cleaned prior to in-water construction work, no refueling will occur near the Yakima River, construction equipment will be regularly checked for drips or leaks, all equipment and vehicles will be required to be kept in good operating condition to minimize exhaust emissions, and standard practices will be used to control fugitive dust during the construction phase.

**6. Actions affecting plant and animal populations [230.75]**

The Corps will coordinate construction activities with state and federal resource agencies to minimize impacts to fishery and wildlife resources. There will be temporary disturbance to wildlife in the project vicinity due to noise from operation of machinery. Timing of construction will avoid impacts to sensitive species.

**7. Actions affecting human use [230.76]**

The Corps has taken all appropriate and practicable steps to assure minimal impacts to human use, safety and general appreciation of the area. A traffic control plan will be developed and implemented to minimize traffic impacts during construction. Realignment of the DID1 levee will retain the existing level of flood protection to residences, businesses and associated public infrastructure. Construction will occur during daylight hours to minimize noise impacts to nearby houses.

**8. Other actions [230.77]**

Best management practices will be used in the proposed construction to ensure that no unnecessary damage to the environment occurs.

**General Policies for Evaluating Permit Applications [33 CFR §320.4]**

**1. Public Interest Review [320.4(a)]**

The Corps finds this ecosystem restoration project to be in compliance with the 404(b)(1) guidelines and not contrary to public interest.

**2. Effects on wetlands [320.4(b)]**

See 404(b)(1) evaluation above. Reconnection of the river to a large portion of the floodplain is expected to create new wetlands and improve conditions in existing wetlands. All work to remove the DID#1 levee will occur in the footprint of the levee prism, thus no impacts to wetlands will occur. The current design path of the realigned levee appears to avoid impacts to the various segmented wetlands and Blue Slough. As design progresses, the alignment will be field verified to ensure wetland and vegetation impacts are avoided or minimized to the greatest extent practicable.

**3. Fish and wildlife [320.4(c)]**

The Corps has found that no negative impacts will occur to sensitive species and impacts to fish and wildlife will be temporary and minimal.

**4. Water quality [320.4(d)]**

The project will involve a discharge of fill material into waters of the United States. The Corps does not issue permits for its own civil works activities. Nevertheless, the Corps will comply substantively with Section 404, and will obtain a water quality certification under Section 401 prior to construction. When project drawings are advanced in the design phase, the Corps will provide these and all other necessary documentation for the Washington State Department of Ecology to certify that the action will not violate established water quality standards.

Section 402 of the Act requires a National Pollutant Discharge Elimination System (NPDES) permit and the associated implementing regulations for General Permit for Discharges from large and small construction activities for construction disturbance over one acre. This project will have land disturbance well over one acre; therefore, a NPDES permit will need to be obtained.

**5. Historic, cultural, scenic, and recreational values [320.4(e)]**

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**6. Effects on limits of the Territorial Sea [320.4(f)]**

Not applicable.

**7. Consideration of property ownership [320.4(g)]**

Federal involvement in ecosystem restoration is supported in law and Executive Order.

**8. Activities affecting coastal zones [320.4(h)]**

The proposed project is not in a coastal management zone and will not affect resources in any Federally recognized coastal management zone.

**9. Activities in marine sanctuaries [320.4(i)]**

Not applicable.

**10. Other federal, state, or local requirements [320.4(j)]**

The Corps will send information about the proposed action to all applicable federal, state, local, and tribal parties. The project will have no effect on terrestrial ESA-listed species and is not likely to adversely affect listed fish species. A Biological Assessment will be provided to the U.S. Fish and Wildlife Services and the National Marine Fisheries Service to ensure compliance with ESA. A Joint Aquatic Resources Form will be filed with the Washington Department of Ecology to ensure compliance with Clean Water Act Section 401. Additionally a Stormwater Pollution Prevention Plan will be developed and a Construction General permit will be sought from the Environmental Protection Agency for compliance with Clean Water Act Section 402.

**11. Safety of impoundment structures [320.4(k)]**

Not applicable.

**12. Floodplain Management [320.4(l)]**

The project is in compliance. The Corps considered alternatives to reduce hazards and risks associated with floods and to minimize the impact of floods on human safety, health and welfare, and restoring and preserving the natural and beneficial values of the base floodplain. The project maintains the status quo of the level of protection for local residences.

**13. Water supply and conservation [320.4(m)]**

No impacts to water supply are anticipated.

**14. Energy conservation and development [320.4(n)]**

Not applicable.

**15. Navigation [320.4(o)]**

This project will not impede current navigability within the Yakima River.

**16. Environmental benefits [320.4(p)]**

The project will reconnect over 320 acres of floodplain and restore natural riverine processes beneficial to native fish through the realignment of the DID#1 levee. Pools, riffles, boulders, logjams, side channels, wetlands and other features will be reconnected with the floodplain and the river. Realignment of the levee will improve fish habitat by giving the river channel the opportunity to migrate and promote bar, island, and side channel formation. This project will also create and restore approximately 20 acres of side channel habitat at the Sportsman's Park Island that is currently lacking in this reach of the Yakima River. Restoration of flow to Blue Slough will restore surface water hydrology to 2 miles/12 acres of relic channel that currently is only wet seasonally when ground water elevations are high. Additionally, replacement of all undersized Blue Slough culverts less than 12 feet will significantly improve fish passage for all species and life stages. The reconnection of the Spring Creek will restore access to rare cold water off-channel fish habitat.

**17. Economics [320.4(q)]**

No impacts to economics are anticipated.

**18. Mitigation [320.4(r)].**

Compensatory mitigation is not anticipated to be required on this project as wetland impacts will be avoided to the greatest extent practicable and a net gain in wetlands is expected through the following actions: 1) The DID#1 Floodplain Topographic Restoration measure will convert relatively unproductive warm ponds to riparian wetland habitat for a variety of birds, mammals, and fish; 2) improved hydrology in Blue Slough will enhance adjacent wetlands, and 3) reconnection of the river to a large portion of the floodplain is expected to create new wetlands and improve conditions in existing wetlands.