

Rehabilitation of Flood Control Works, Yakima Authorized Right and Left Bank Levees

Yakima, Washington

AMENDED FINDING OF NO SIGNIFICANT IMPACT (FONSI)

1. Background.

The Yakima Authorized Right Bank and Left Bank Federal Levees, approximately 9 miles in total length, provide flood protection to the transportation infrastructure and commercial, residential, and agricultural properties in the City of Yakima and to surrounding areas. Flooding on the Yakima River in November and December, 2015, damaged two sections totaling 1,200 feet of the left bank levee and four sections totaling 2,995 feet of the right bank levee. Prior to the flood event, both levees provided protection up to the 100-year return period. In their damaged condition, the levees are estimated to provide a 5-year level of protection. On 22 May 2017, the FONSI, supported by the 2017 Environmental Assessment (EA), was signed for the Rehabilitation of the Yakima Right Bank and Left Bank Levees. Repairs to these damaged locations were substantially completed in summer of 2017.

Low flows in the summer of 2017 revealed a fifth site with additional damage from spring 2017 flooding along 880 feet on the right bank levee. The local sponsor requested Corps assistance for repairs to this new site. A Supplemental EA was prepared in 2018 to analyze potential environmental impacts from repair of the fifth site on the right bank, in conjunction with the impacts of repairs to the four other sites. The 2017 EA and 2018 Supplemental EA are incorporated by reference in this Amended FONSI.

2. Proposed Action.

The Seattle District, U.S. Army Corps of Engineers (Corps) has determined that the preferred alternative is the Repair In-Kind Alternative. Repairs will be similar at both the left and right bank levees. The action to be constructed is described in the 2017 EA and in Section 6.4 of the 2018 Supplemental EA. The Supplemental EA provides new data and analysis in relation to the fifth site. The actions for repairs to the five sites on these two levees are briefly summarized as follows:

- a. The repair will be in the footprint the levees occupied before flood damage. All repairs will be confined to the riverward slope of the levees, the levee crests and the adjacent river bed.
- b. Repairs will remove armor material from levee slopes and toes, restore the slope profiles, and restore protection with rock armor. Additional rock armor will be added to establish launchable toes. Willow bundles will be integrated into the levee repair. After

construction, drivable surfaces will be restored. Repairs will be constructed to transition smoothly into adjoining sections of the levees.

c. Existing access roads and previously disturbed staging areas will be used to support the action and as disposal sites for any excess material.

d. All work will be confined to the pre-damaged levee footprint. All access will be over existing roads and trails, and all staging will be in previously developed or disturbed uplands.

3. Impacts Summary.

Pursuant to the National Environmental Policy Act (NEPA) the Corps prepared an EA on the initial four sites, and then a Supplemental EA after discovery of the fifth site. These EAs evaluate the predicted environmental impacts associated with the proposed action and whether that action would cause significant impacts to the quality of the human environment as briefly summarized below.

a. The Corps does not issue permits for its own civil works activities. Nevertheless, the Corps has accepted responsibility for the compliance of its civil works projects with Section 404 of the Clean Water Act (CWA), as well as the obligation to seek water quality certification under Section 401. After examining the proposed repair, the Corps concluded that the proposed repair is not subject to regulation under Sections 401, 402, and 404 of the CWA. The exemption from the requirement to evaluate the effects of discharges of fill material into waters of the United States under 33 USC 1344(f)(1)(B) applies because all riverward work at the repair sites will be conducted on a currently serviceable structure (i.e., the levee and groin) within pre-damaged levee and groin footprints and the character, scope, and size of the resulting structures will not change as compared to the original fill design. Therefore, the proposed repair does not require a 404 (b)(1) evaluation or Section 401 Water quality Certification.

b. The Corps has determined that the project location is not located within the coastal zone and is not reasonably anticipated to affect the resources and uses of the coastal zone, and will therefore not require a Coastal Zone Management Consistency Determination.

c. Section 106 of the National Historic Preservation Act (16 USC 470) requires Federal agencies to take into account the effects of proposed federal undertakings on historic properties included or eligible for the National Register of Historic Places. The implementing regulations for Section 106 (36 C.F.R. § 800) require Federal agencies to consult with various parties, including the Advisory Council on Historic Preservation, the State Historic Preservation Office (SHPO) or Tribal Historic Preservation Office (THPO), and Indian tribes, to identify and evaluate historic properties, and to assess and resolve effects to historic properties.

The Corps has consulted with the Washington SHPO and the Confederated Tribes and Bands of the Yakama Nation for this project. Based on the results of both literature and records review and field investigation conducted by the Corps, the Corps has found that the Yakima Authorized Right and Left Bank levee area of potential effect contains no known historic properties. As a result, the Corps found that there would be no historic properties affected by emergency repair-in-kind of the Yakima Authorized Right and Left Bank levees. The Corps made a determination of No Historic Properties Affected and notified SHPO of this finding on 13 April 2017 and on 15 November 2017. The SHPO agreed with the Corps' findings in a letter dated 19 April 2017 and 15 November 2017. A letter requesting comment or concerns was sent to the Yakama Nation on 26 October 2016, 27 March 2017, and 11 September 2017. The Yakama Nation did not comment on the undertaking.

d. Per Section 7 of the Endangered Species Act (ESA), a Biological Assessment (BA) documenting the effects of the proposed action on listed species was submitted on 11 June 2016 to the United States Fish and Wildlife Services (USFWS) and National Marine Fisheries Service (NMFS) for informal consultation. On 17 November 2016 the USFWS concurred with the Corps determination of "may affect, not likely to adversely affect" bull trout and NMFS indicated non-concurrence with the Corps determination. In February 2017, two additional sites (right bank sites 3 & 4) were identified and the Corps reinitiated consultation with the Services. An update to the BA was provided to the Services on 13 March 2017 for the two additional sites. The Services did not conclude consultation under this updated BA, but did provide draft Reasonable and Prudent Measures (RPMs). One of these RPMs included mitigation plantings of a 1.5:1 ratio for all shrubs and trees removed during the repair. This RPM was implemented. Due to the urgent nature of completing the emergency actions to protect human life and property and because the repair was time-critical in light of the ensuing flood season, the Corps proceeded with signing and execution of the initial FONSI prior to concluding ESA consultation. However, consultation was completed with USFWS via email on 13 April 2017 and with NMFS after receipt of a Biological Opinion (BO) on 24 May 2017.

After discovery of the fifth site on the right bank levee, the Corps prepared and sent a BA to USFWS and NMFS on 20 April 2018 for informal consultation. On 1 May 2018 USFWS concurred with the Corps' determination of "may affect, not likely to adversely affect," and a BO was received from NMFS on 25 June 2018. The Corps reviewed and responded to conditions outlined in the BO on 18 July 2018 indicating how these conditions will be implemented by the agency, and explaining in one relevant instance how implementation would be technically infeasible. This response is found in Appendix E of the Supplemental EA.


e. Unavoidable adverse effects associated with the Repair In-Kind Alternative would be: (1) temporary and localized increases in noise, activity, and emissions which may affect fish and wildlife in the area; (2) temporary and localized disruption of local traffic by construction activity and vehicles; (3) irretrievable commitment of fuels and other

materials for repairs; (4) temporary and localized increase in turbidity levels during in-water construction which may affect aquatic organisms in the area; (5) removal of vegetation from within the proposed construction area in the riparian zone; and (6) degradation of riparian and aquatic habitat associated with impacts to a side channel at right bank site 3.

4. Conclusion.

I find that the proposed action, consisting of four repair actions largely implemented in 2017 in conjunction with a repair at Yakima Right Bank Site 5, will not result in significant adverse environmental impacts and complies with all applicable laws, regulations, and agency consultations, including the CWA, ESA, NHPA, and NEPA, as well as applicable Executive Orders. Based on the analysis described above and provided in more detail in the original NEPA documentation from 22 May 2017 and the accompanying Supplemental EA addressing the Site 5 repair in isolation as well as the two courses of work collectively, the Rehabilitation of the Yakima River Right and Left Bank Levee is not a major Federal action significantly affecting the quality of the human environment, and therefore, does not require preparation of an environmental impact statement.

23 Aug 18
DATE



MARK A. GERALDI
Colonel, Corps of Engineers
Commanding



Rehabilitation of Flood Control Works Yakima Authorized Right and Left Bank Levees

Supplemental Environmental Assessment for Right Bank Site 5

YAKIMA COUNTY, WASHINGTON



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

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1 INTRODUCTION

The purpose of an Environmental Assessment (EA), as reflected in 15 CFR sections 1500.1(c) and 1508.9(a)(1) of the Council on Environmental Quality (CEQ) regulations implementing the National Environmental Policy Act (NEPA) of 1969 (as amended), is to “provide sufficient evidence and analysis for determining whether to prepare an Environmental Impact Statement (EIS) or a Finding of No Significant Impact (FONSI)” on actions authorized, funded, or carried out by the Federal Government, and to assist agency officials in taking actions that are based on understanding of “environmental consequences, and take actions that protect, restore, and enhance the environment.”

This Supplemental EA provides an updated project description to account for one additional Yakima Authorized Right Bank Levee site damaged in 2017 spring flooding. The proposed repair would occur on the Naches River near the confluence with the Yakima River. The additional site is the fifth damaged site on the Yakima Right Bank levee and is identified as Site 5. Repairs would be conducted by the U.S. Army Corps of Engineers (Corps) and the local non-Federal sponsor, Yakima County.

2 BACKGROUND

Previous notices of preparation for the Rehabilitation of Flood Control Works Yakima Authorized Right and Left Bank Levees project were released for public review and comment from 15 September 2016 to 14 October 2016 and from 24 February 2017 to 10 March 2017 and associated NEPA documentation for that project concluded with a FONSI promulgated on 22 May 2017. The repairs discussed in these notices are substantially completed. Offsite plantings are still awaiting installation due to water levels blocking access to the planting location. This Supplemental EA addresses the addition of one more site to the Yakima Right Bank Levee that was not included in the initial NEPA documentation.

Low flows during the summer of 2017 revealed damages from spring 2017 flooding. Additionally, the local sponsor identified a failing portion of the bicycle path that passes underneath the I-82 Bridge. Although the damage occurred prior to the promulgation of the May 2017 FONSI, the non-Federal sponsor was unaware of these damages and so did not report it to the Corps for inclusion into the initial repair activities until after NEPA was completed. In light of the close connection between the sections of the Yakima River Right Bank Levee damaged in 2015 and 2017, it is appropriate that the Site 5 repair be viewed as the latest episode in an ongoing course of agency action, and addressed under NEPA in a Supplemental EA. This Supplemental EA incorporates the additional Right Bank Site 5 into the proposed action.

The initial FONSI and EA for the Yakima Right and Left Bank repairs concluded that the levee repairs were not a major Federal action significantly affecting the quality of the human environment. This Supplemental EA describes and analyzes the incremental effects of the Site 5 repair effort, in modification of and in addition to the repair work conducted at the initial four sites. The analysis conducted in the underlying EA on the initial four sites is incorporated herein by reference, and is used to form the basis of the conclusion regarding significance of effects drawn in this Supplemental EA.

3 PURPOSE AND NEED

The purpose of the project is to restore the damaged levee system in order to protect lives and property from flooding. The need is to take appropriate measures to address damage resulting from natural flood events of irregularly occurring severity which has reduced the level of protection (LOP) of the levee. Prior to the damage, the Yakima Authorized Right Bank levee offered a 100-year LOP. In the current damaged state, Site 5 provides protection from a 10-year flood event.

4 AUTHORITY

The proposed levee repair is authorized by Public Law 84-99 (33 U.S. Code Section 701n). Corps rehabilitation and restoration work under this authority is limited to flood control works damaged or destroyed by floods. The statute authorizes rehabilitation to the LOP exhibited by the flood control work prior to the damaging event. Yakima County is the non-Federal local sponsor for this project.

5 PROJECT LOCATION AND DESCRIPTION

Yakima Right Bank Site 5 is part of the Yakima Authorized Right Bank Federal Levee along the right bank of the Yakima River. The entire Right Bank levee is approximately 5 miles long. Along the opposite shore of the river is the Yakima Authorized Left Bank Federal Levee. The location of the damaged site discussed in this Supplemental EA, along with the locations of the previous repairs from the original 2017 EA, are shown in Figure 1. Repairs to the previous 4 damage locations on the Right Bank levee, along with those to the Left Bank, are completed. For more information regarding these sites please refer to the original 2017 EA which can be accessed at the Seattle District Corps' website environmental documents and searching "Yakima Authorized Right and Left Bank Levee PL 84-99 Repairs". The website is accessible at:

<http://www.nws.usace.army.mil/Missions/Environmental/Environmental-Documents/>

5.1 YAKIMA RIGHT BANK SITE 5

Yakima Right Bank Site 5 is located on the right bank of the Naches River, just upstream of the confluence with the Yakima River. This is at the end of the Naches Valley which is characterized by shrub-steppe/grassland. Within the Naches Valley floodplain, the Naches River meanders and braids, creating a wider and more diverse riparian band along the river than further upstream where it is more constrained by mountainous valley slopes. The extent of the natural shrub-steppe/grassland and riparian areas have been greatly diminished due to agricultural land use and urban development. Irrigation water drawn from the Naches River supports a large agricultural base which covers much of the Naches Valley floodplain and extends downstream into the Yakima Valley. The largest and closest town in the region is Yakima, located immediately landward and generally south of the Site 5 levee.

This stretch of the Naches River experiences the effects of increased water release from Rimrock Lake. This event, known colloquially as the 'flip-flop' consists of selectively releasing irrigation water between two locations, the upper Yakima Reservoirs or upper Naches reservoirs such as Rimrock Lake. Irrigation water is released from the upper Yakima reservoirs until early September. During this time releases from Rimrock Lake, the reservoir behind Tieton Dam, are reduced. Then in early September, the pattern of releases is reversed (flip-flopped), and releases from Rimrock, and to a lesser degree Bumping Lake, satisfy irrigation demand while Yakima releases are curtailed. Water release from Rimrock into the Naches River continue to ramp up, almost quadrupling late summer flows when natural flow fluctuations would be uncommon. Flows continue to rise and normally peak in mid-late September and eventually drop back down around mid-October.

In its undamaged condition, Right Bank Site 5 is approximately 2 to 8 feet high on the landward side and predominately composed of silty, sandy, gravel riverbed material with a rock armor blanket of Class IV riprap on the riverward slope. The landward slope of the levee is approximately 2H:1V, while the riverward slope ranges from 2H:1V to 3H:1V. The levee crest is about 10 feet wide and surfaced with an asphalt pavement. The toe at Site 5 has a variable length and height. Typical toes along the levee are 5 feet tall and extend 10 feet riverward from the base of the levee slope.

Damages to Site 5 extend from below the I-82 Bridge upstream 880 feet. This corresponds to Station 229+80 to 221+00. The damage consists mostly of loss of toe rock while a portion of the path under the bridge is falling into the river. Photographs of the damaged levee are found in Appendix A and Figure 1 illustrates the approximate extent of damage at Yakima Right Bank Site 5.

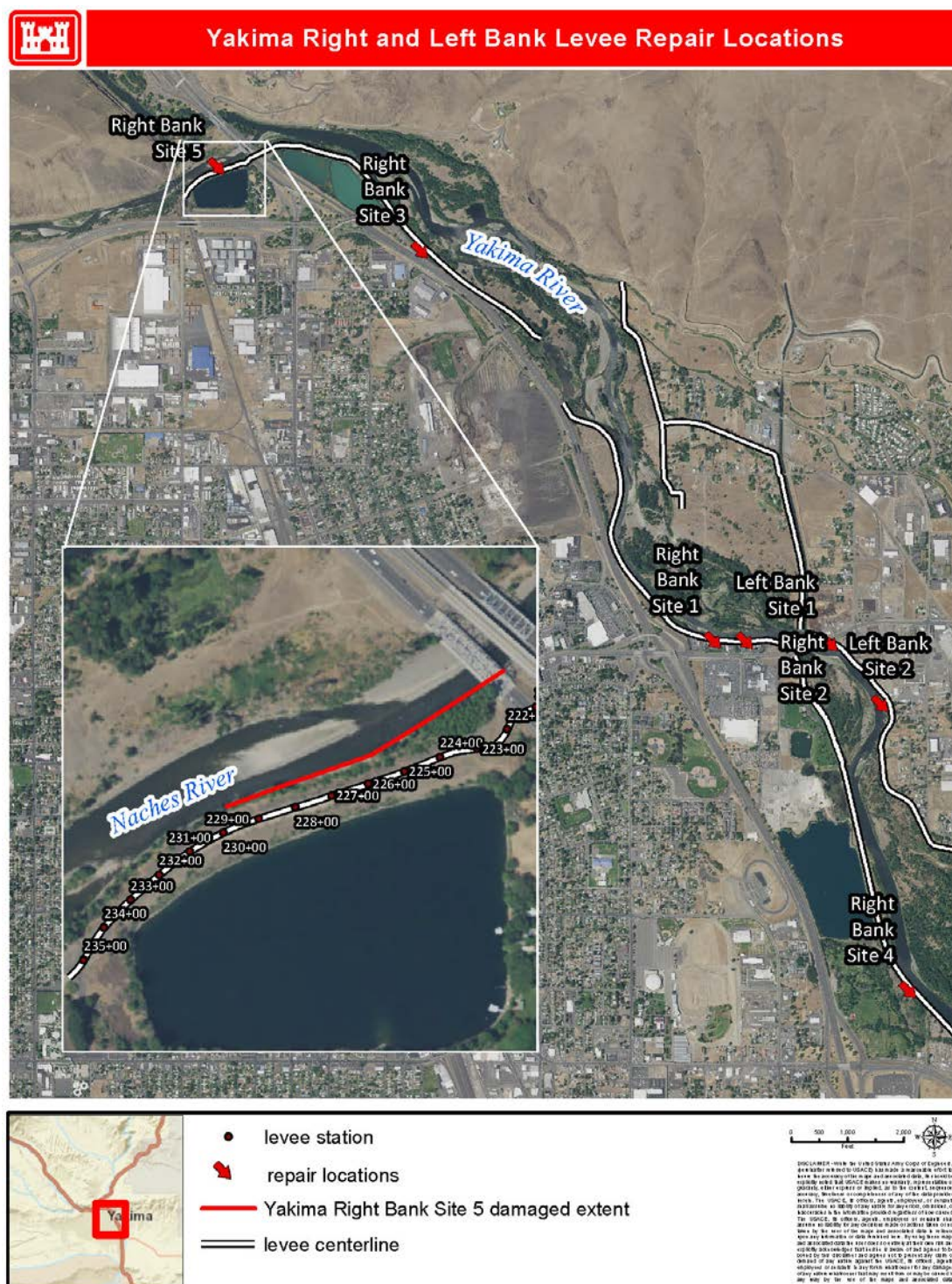


Figure 1. Location of all Yakima Right and Left Bank levee repairs and damage extent of Right Bank Site 5.

6 ALTERNATIVES CONSIDERED

Alternatives considered under NEPA must include the proposed action (preferred alternative), and the No Action Alternative, as well as a reasonable range of alternatives. Multiple alternatives to address damage to the Yakima Authorized Right Bank Site 5 Levee were considered including the No Action Alternative, the Repair In-Kind Alternative, the Setback Alternative, and the Non-Structural Alternative.

6.1 NO ACTION ALTERNATIVE

Under this alternative, the Corps would not provide assistance to Yakima County for repairs. In lieu of Federal assistance through the Corps, Yakima County, Washington State, the local communities, or some other entity could undertake the repairs. If none of these entities undertake repairs then the levee would remain damaged. During any flood event threatening the integrity of the levee system, the Corps or other Federal and non-Federal agencies may act under emergency authorities to preserve the levee system and, to the extent possible, maintain protection of life and property behind the levee. Responding to damages during a flood event, however, would be temporary, less certain of success, potentially more expensive, and could be less protective of environmental and cultural resources. A response would also take time to activate and execute, so there is risk that it would not prevent levee failure, such as overtopping or breaching.

The No Action Alternative is not recommended because it would risk failure of the levee system and would present unacceptable risk to life and property. This alternative does not meet the project purpose. While the No Action Alternative is not recommended, it is carried forward for further evaluation to serve as a base condition for evaluation of other alternatives.

6.2 NON-STRUCTURAL ALTERNATIVE

This alternative consists of floodplain management strategies generally involving changes in land use offered by other Federal and state programs. Such strategies would include zoning, easements, flood warning, floodplain evacuation, and flood insurance. Nonstructural strategies would also involve acquisition, relocation, elevation, and flood proofing existing structures. This alternative could also include relocation of some or all existing structures, utilities, and other infrastructure from the areas protected by the levee. The extensive array of structures, utilities, roads, or other infrastructure in some of the protected areas makes this alternative infeasible in the immediate future. The local sponsor has been informed of their option to pursue this alternative but has chosen not to. The Corps does not have authority to pursue a non-structural alternative in the absence of participation by the non-Federal interest. This alternative will thus not be considered further.

6.3 LEVEE SETBACK ALTERNATIVE

This alternative would shift the alignment of the levee embankments landward by a yet-to-be-determined distance in order to avoid or minimize direct contact with the river current. Typically, a setback would be a newly-constructed armored earth embankment structure with a buried toe. The old levee would likely be abandoned in place after salvaging material (armor and embankment) from it for reuse in the new structure. Construction of a setback levee may take longer and be far more expensive than other alternatives due to more extensive embankment material requirements and land acquisition; although it would likely result in less in-water work. Generally speaking, such an approach may encroach on public and privately owned properties used for residential, business, and other purposes. All real estate needs, including interests in the setback footprint, must be provided by the local sponsor (Yakima County). This alternative is often difficult to implement quickly if real estate takes long to acquire. If real estate is not available to be acquired in the setback alignment then this alternative would not be possible. In this case, the damaged levee is adjacent to major transportation routes and

infrastructure and thus real estate interests are not available within the rapid time frame needed for emergency repairs. Under some circumstances the non-Federal interest must incur the incremental cost of constructing a levee setback, in which case the setback alternative cannot be pursued without the affirmative participation of that non-Federal interest. Yakima County has not committed to sharing the cost and other responsibilities that construction of a setback levee would entail. While the absence of real estate and sponsor participation makes implementation of this alternative in the available time interval unlikely, it is carried forward into analysis for comparison purposes between the other alternatives.

6.4 REPAIR IN-KIND ALTERNATIVE (PREFERRED ALTERNATIVE)

In light of available real estate, sponsor support, and the need to conduct the repairs as quickly as possible, the Corps proposes to repair the levee to its pre-damaged footprint and alignment as the only feasible alternative that meets the project purpose. Riprap within reach of an excavator would be salvaged for reuse into the project. Most of this recycled riprap would be from the levee slope as none was visible within the adjacent river and is presumed to have been transported downstream out of the repair area. Total construction length of the repair, including smooth transitions into the existing slopes, would be 880 feet (Stations 229+80 to 221+00). All work would occur within the designed and pre-damage footprint and profile. Work would require removing streamside shrubs and trees from the levee within the construction project footprint. From start to completion, the repair is expected to take four weeks and would occur in the autumn of 2018 (October 15 to November 30) to remain within the fish window agreed upon with the U.S. Fish and Wildlife Service (USFWS) and the National Marine Fisheries Service (NMFS). This window occurs during a time of generally lower flows in the river and would result in less in-water work, which as a result would decrease impacts to aquatic organisms.

Work would occur in a single construction period with four major components, as described below. Specific existing conditions for the location(s) where the fill material would be purchased are unknown, as the materials would be purchased from local, privately owned companies. However, any borrow site, quarry, or gravel mine would be fully permitted by the state. Additionally, any onsite material suitable for reuse would be incorporated into the repair.

CONSTRUCTION SEQUENCING OVERVIEW:

1. Field-stake project footprints and install proper best management practices (BMPs).
2. Establish staging and material re-handling site.
3. Clear and prepare site.
4. Remove remnant riprap and other materials from levee slope. Salvage and stockpile materials to be re-used.
5. Excavate sloughed embankment material at the scoured riverward toe and restore slope with quarry spalls.
6. Construct launchable toe as shown on the plans.
7. Incorporate willow plantings from Stations 229+00 to approximately 222+00, approximately 780 feet along Section A and D (Appendix B).
8. Restore riprap along slope where it has been disturbed.
9. Repair asphalt path.
10. Clean up and mulch and hydroseed the soil on riverward slope and all disturbed areas.

SITE PREPARATION

The first component of construction includes the preparation of access routes and clearing the levee of vegetation. The site limits would be clearly marked using stakes or flagging. Storage and staging would occur along the levee and as depicted in the design plans (Appendix B). Staging activities would consist of temporarily stockpiling construction materials, supplies, equipment, and vehicles. Work would be limited to the areas shown in the plan set.

TOE REPAIR

After the slope is cleared an excavator would retrieve any salvageable riprap that was shed from the levee toe or along the damaged slope for reuse. Then the damaged levee toe would be deconstructed where damaged. All riprap and reusable material from these efforts would be stockpiled for reuse. Following this the launchable toe would be reconstructed as shown in the design plan (Appendix B) across the four typical cross sections between Station 229+80 to 221+00 (Sections A, B, C, and D in Appendix B). The repair would match the existing, undamaged slope and grade of the upstream and downstream levee. Whenever deconstruction reveals levee embankment material (soil), a layer of quarry spalls would be placed so that riprap is not sitting directly on soil. The design plan in Appendix B does not show quarry spalls in typical cross sections except at Section C. This is because Section C is the only location where quarry spalls are thought to be exposed and missing. Other sections have existing, but damaged, armor over an undamaged filter layer so spalls are not expected to be replaced unless disturbed during the repair activities. Any quarry spalls would be placed using small bucket loads. All riprap would be placed individually using the excavators' bucket-thumb attachment or small controlled bucketfuls.

The sequence of reconstruction through horizontal lifts along stations 229+80 to 222+00 (Sections A and D), would be interrupted to install willow bundles at the ordinary high water mark (OHWM). The OHWM would be determined on site to match the existing vegetation line. Willow bundles consist of a grouping between six to ten coyote willow stakes surrounded by soil, approximately 12 inches in diameter and inserted 3 feet deep into the slope. The bundles would be installed horizontally at the OHWM. Each bundle would be located 10 feet from one another embedded into the slope/topsoil pocket to a depth of 2/3 of the length of each bundle.

Section C (between approximately Station 222+00 and Station 221+50) and Section B, Station 221+50 to 221+00, constitute a transitional area from the upstream levee to the levee below the bridge. Flood waters caused greater damage at Section C resulting in more toe rock loss than the 800 feet upstream of it. This resulted in exposure and loss of the spall rock filter layer. Repairs here would require replacement of quarry spall rock and riprap armor that was washed away during the flood event. Replacement of this armor would extend up the slope to the trail located on the levee top. This trail is located below the levee crest in Section B and C as it curves down the levee slope to underneath the bridge.

Along part of Section B flood waters washed away the riprap toe, daylighting gabion boxes and parts of the concrete bridge foundation of the bridge. Since little to no soil or levee embankment material is exposed, quarry spalls are not required. Therefore, only riprap would be placed in this section.

UPPER SLOPE REPAIR

Repairs to the toe damage in Sections A and D is not accessible from the levee top. To reach the damage in these two sections construction equipment would need to cross the levee's upper slope. This is expected to damage existing riprap which would need to be restored to an undamaged state.

Along Section A these repairs would be straight forward. The slope is relatively consistent and free of vegetation. Equipment can drive over existing riprap and restore the surface with minimal disturbance. However, at Section D this upper slope restoration is expected to be more extensive. Between Stations 224+00 and 222+00 (see Section D in Appendix B) the slope has a bench of variable width and is heavily vegetated, including a number of shrubs and approximately 45 cottonwood and aspen trees larger than 20 feet in height. While the variable width is not an issue, the removal of shrubs and trees, including their root systems, are expected to disturb the levee embankment and armor. If conditions allow, a single ingress and egress path will be used to access the levee toe (See Section D in Appendix B). Doing so would reduce vegetation removal and require less work to restore the upper slope. However, if site conditions prevent a single path, potentially all vegetation between Sections 224+00 and 222+00 would need to be removed requiring extensive upper slope repairs.

LEVEE TOP

After work on the launchable toe and levee slope is completed, the levee top would be repaired. Damages to the levee top would not be a result of the flood event, but may result from heavy equipment utilized during the repair. Where damaged, the paved top would be removed from the site and replaced. Three inches of compacted crushed surfacing base course would be placed as a base for the repaired path finished with three inches of asphalt. The length of path to be repaired accounts for the sections of the path impacted by the haul route.

6.5 CONSERVATION MEASURES

Conservation measures for effects of the proposed action are evaluated as part of the NEPA process. Conservation measures could take any of the following forms:

- Avoiding effects altogether by not taking a certain action or parts of an action.
- Minimizing effects by limiting the degree or magnitude of the action and its implementation.
- Rectifying effects by repairing, rehabilitating, or restoring the affected environment.
- Reducing or eliminating effects over time by preservation and maintenance actions during the life of the action.
- Compensating for effects by replacing or providing substitute resources or environments.

The Corps has developed a list of conservation measures and incorporated these into the levee repair to reduce environmental impacts. For this project the measures are listed and elaborated below:

- Placement of woody debris generated onsite along completed levee toe
- Hydroseeding
- Willow bundle plantings and post project monitoring
- Reduced trimming to installed willow bundles.
- Offsite riparian plantings
- Minimizing access and vegetation removal between Stations 224+00 and 222+00 (See note 13 in design plan and example cross section D in Appendix B).
- Follow-up post-construction review of conservation measures

Any woody debris generated from the repair would be placed along the completed levee toe. This includes logs, rootwads, and woody shrub debris. The woody debris is typically placed along the levee toe above the waterline and would be placed to avoid damaging the willow plantings.

Upon completion of all construction activities, areas disturbed by the repairs, staging activities, or road access would be restored with native grasses or new road surfaces, as appropriate. Reseeding of native grasses would be conducted using hydroseed techniques where appropriate soil cover exists. Hydroseeding reduces soil erosion and helps prevent the establishment of invasive plants.

The Corps imposes rigorous safety considerations on levees, one aspect of which is restricting vegetation growth on levees within 15 feet of the levee toe (as determined by the elevation of the landward grade). Maintaining these safety measures is generally the responsibility of the local non-Federal sponsor, but in conducting repairs under PL 84-99 the Corps adheres to its vegetation standards. The Corps integrates vegetation in light of impacts to endangered and threatened listed species, but must consider levee structural integrity, as well as accessibility and inspectability. For the proposed repair the Corps is integrating willow bundles at the OHWM between Stations 229+80 and 222+00 (section A and D) as described above in Section 6.4. These willow bundles are to be monitored at the end of the first year of construction (fall 2019) and replanted as necessary. In the event that any replanting is necessary, the Corps would monitor these new plantings for one additional year. Additionally, the Corps is coordinating with the non-Federal sponsor to develop a maintenance plan which would maintain the bundles as a mitigation feature while preserving adequate visual fields necessary for inspection of the levee structure.

Offsite plantings would also be conducted to mitigate for the loss of riparian vegetation along the levee. The plantings compensating for losses at all five sites have not yet been installed by Yakima County due to water levels blocking access to the planting location, but will be installed as soon as the location is accessible. The plantings are to be installed in a large cobble bar adjacent to the Yakima River.

Approximately 200 trees, primarily sapling in size, are estimated to be within the repair area at Site 5. A majority of the trees are small, at most 3 to 5 feet tall. Of the 200, approximately 45 trees are larger (greater than 20 feet in height), consisting primarily of cottonwood and aspen between Stations 224+00 and 222+00 (Section D). Replacing this vegetation at a 1.5:1 ratio, 300 riparian plants would be planted in addition to the 104 trees and 645 shrubs compensating for the previous repairs at the other four Yakima River sites. These offsite plantings would consist of a mixture of black cottonwood, coyote willow, golden current, red osier dogwood, Nootka rose, and service berry. As described above and in Section 6.4, Section D contains a majority of this vegetation. If conditions allow, a single ingress and egress path would be used to reduce the amount of vegetation removed and upper slope repairs required. However, if this path is not possible then all vegetation could be removed in this area of the repair. Therefore, whether or not it is all removed, the amount of offsite plantings described above accounts for the maximum amount potentially affected from the repair.

The Site 5 repair will be examined after the repair is completed. If conservation measures and repairs are different than described here or what is depicted in the plans, they will be recorded and described. This will be provided to the USFWS and NMFS.

6.6 BEST MANAGEMENT PRACTICES

Below are best management practices (BMPs) that will be incorporated into the action. Some are integrated into the repair, while others are guides to operation and care of equipment. Note, some of these have been mentioned above.

1. In-water work is limited to a window from 15 October to 30 November which matches times of lower flows in the river.
2. Equipment used near the water would be cleaned prior to construction.
3. Rocks would only be placed within the project footprint, from the toe and up the levee slope. All placement would be done individually along the riverward slope and toe, or in small controlled bucketfuls if material is small. No end dumping of rock would occur.
4. Biodegradable hydraulic fluids would be used in machinery where appropriate.
5. Refueling would occur on the backside of the levee to avoid potential spills into the river.
6. Construction equipment shall be regularly checked for drips and leaks. Any leaks and drips would be cleaned up and fixed promptly, or the equipment would be removed from the project site.
7. At least one fuel spill kit with absorbent pads would be onsite at all times, and personnel would be properly trained in its use.
8. Drive trains of equipment would not operate in the water.
9. At least one Corps biologist and geotechnical engineer would be available via phone during construction. Corps biologists may visit the construction site and provide periodic updates to the Services on construction. The geotechnical engineer may also visit the construction site. All visits would be coordinated with the Project Manager and Construction Manager.
10. A preconstruction site visit would be scheduled with USFWS and NMFS.
11. Monitoring of turbidity levels upstream and downstream of the project site during construction would occur. If turbidity standards are exceeded, measures to stop or reduce turbidity would be taken. Sediment generating activities would be halted until standards are met and construction methods changed to avoid future exceedances if feasible. Results of turbidity monitoring would be recorded and provided to the project biologist once in-water work is completed. See Appendix C for more details.
12. Measures to minimize erosion and sedimentation caused by runoff from disturbed soils or from in-water work would be implemented. Measures would be tailored to site conditions and may include silt curtains, supersacks, hay bales, and/or coir logs and jute.
13. All construction materials would be contamination-free, such as oils and excessive sediment.
14. After construction is completed the riverward slope and all disturbed areas on the site would be reseeded using native hydroseed.
15. Vegetation removal would be limited to the repair site.
16. Willow bundles would be incorporated into the repair.
17. Removed woody vegetation would be placed along the completed toe of the repaired levee or where possible to provide habitat function to the aquatic environment. This includes any tree trunks and large shrubs.

7 AFFECTED ENVIRONMENT AND ENVIRONMENTAL EFFECTS

7.1 HYDROLOGY, TOPOGRAPHY, AND SOILS

Floodplain development has replaced what was once a large and diverse floodplain that provided a variety of riparian and aquatic habitats (multiple channels, forest, undercut banks, gravel bars, large woody debris). The majority of the floodplain is now occupied by agricultural, suburban, and urban development. Additionally, most of the floodplain in the action area is isolated from the river by levees

and transportation infrastructure. Floodplain development has significantly reduced riparian habitat and has altered river conditions, impacting the aquatic environment. Development has increased runoff, carrying nutrients, chemicals and wastes into streams.

In a natural state, the Naches River is dominated by snowmelt-driven discharges in May or June that then decline to ground-water driven base flows in August and September. Late autumn rainfall and minor snowmelt augment summer base flow. Managed flows now provide discharges out of phase with the natural hydrograph to meet irrigation demands for agriculture.

Flows in the Naches River can almost quadruple in late August/early September until dropping back down in late September/early October. This rapid increase in flow in the Tieton and lower Naches River takes place during a time of year when natural flow fluctuations would be uncommon.

The Naches River flows into the Naches Valley shortly after its confluence with the Tieton River. The area below the confluence with the Tieton is less constricted than the river's upper reaches in the Nile Valley which is surrounded by rugged hills and mountains. The more open Naches Valley, now more constricted than in the past due to human development, has a wide floodplain in which the Naches River can meander and support a wider riparian area with occasional river braiding. The Naches River continues to flow east until it enters the Yakima Valley and the Yakima River near the City of Yakima, Washington. Yakima Right Bank Site 5 is located on the lower Naches River just upstream of its confluence with the Yakima River.

Soils at Site 5 consist of the Weirman Series of soils, specifically Weirman sandy loam. This soil is made of very deep and somewhat excessively drained soils that are formed in alluvium. These soils are found on terraces and floodplains on 0 to 5 percent slopes. Levee embankment material consists of compacted, sandy gravel with spalls and clay. Underlying the levee and surface soil the substrate is comprised of brown clay and gravel with cobbles and boulders.

7.1.1 No Action Alternative

Basin-wide hydrological functions would not be affected. Taking no action to repair the damaged levee may lead to emergency flood fight actions during flood events. Such actions may repair the levee but would be constructed under demanding conditions that may result in poor structural quality. If no flood fight actions are taken, or if flood damage is significant enough, the levee may breach. This would cause flooding and could potentially result in a new river alignment.

Topography and soils would not be substantially affected, aside from any continued localized erosion at the site from normal conditions or floods. The amount of erosion would depend on flood severity and the kind of response to the flooding taken at the damaged site.

7.1.2 Levee Setback Alternative

The impacts to hydrology, topology, and soils would be dependent on the scope of the setback. Setbacks are widely regarded as beneficial as they restore natural conditions, such as a widened floodplain. No significant negative changes to hydrology, topology and soils would be expected.

7.1.3 Repair In-Kind Alternative

The Repair In-Kind Alternative would maintain local topographic, hydrologic and soil conditions. Construction activities would cause minor, temporary alterations of soil conditions and hydrology. After construction, the area would be returned to pre-damaged conditions.

7.2 VEGETATION

Riparian vegetation is important for recruitment of large woody debris, shading, cover, food, complexity of shoreline, nutrient input, and as perching and nesting habitat for birds. The impacts to the function of vegetation in relation to fish and wildlife are discussed further in Sections 7.3 and 7.4. Vegetation communities outside of the riparian zones differ between the upper and lower Naches River. Within the upper Naches River, the vegetation community consists primarily of open ponderosa pine forest while in the lower Naches River ponderosa pine forest diminishes and the natural habitat is characterized by shrub-steppe/grassland and agricultural fields. A typical riparian area would consist of cottonwood, willow, red osier dogwood, red alder, and other trees and shrubs growing within the floodplain.

The Corps imposes rigorous safety considerations on levees, one aspect of which is restricting vegetation growth on levees within 15 feet of the levee toe (as determined by the elevation of the landward grade). Maintaining these safety measures is generally the responsibility of the local non-Federal sponsor, but in conducting repairs under PL 84-99 the Corps adheres to its vegetation standards. This standard, along with the hardened condition of the riverward slopes typically alters the riparian condition, as compared to an unarmored levee slope. Maintenance and armor can remove, preclude, stunt, or slow down natural riparian growth, especially in dryer climates such as those found in central Washington.

Yakima Right Bank Site 5 is located along a recreational path. The path is managed to a degree along the upper slopes; however, the lower slope and toe have been left relatively untouched and a thin ribbon of riparian vegetation has developed. However, the local sponsor has done some site maintenance, trimming and removing large trees near the bridge. The vegetation on the levee consists primarily of saplings, most of which are 3 to 5 feet tall. Larger trees are present that are greater than 20 feet tall and consist mostly of cottonwood and aspen. See Appendix A for site photos.

7.2.1 No Action Alternative

Under the No Action Alternative, vegetation at the project site would continue to be managed by the local non-Federal sponsor. The Local non-Federal sponsor's practices have included trimming levee vegetation to maintain levee access, levee inspectability, and levee structural integrity. If flood fight actions are taken, the area affected would likely lose any vegetation along the levee slope.

7.2.2 Levee Setback Alternative

A setback would disturb any vegetation along its alignment while moving the new levee centerline away from the river. This would open up the floodplain and remove the potential application of the Corps vegetation standards along the old alignment. Material from the old alignment would likely be reused in the new, with the remaining material left in place. After completion, a setback would open up the floodplain for more natural riverine conditions to occur and would likely result in a net benefit for riparian vegetation as it recruits in the widened floodplain.

7.2.3 Repair In-Kind Alternative

Repairing the levee in-kind would remove existing vegetation within the repair area. An estimated 200 trees, primarily sapling in size, would be removed. Approximately 45 of these trees are greater than 20 feet high. To mitigate for this loss the Corps would place willow bundles along 800 feet of the repair and replace the lost vegetation offsite at a 1.5:1 ratio (300 plantings). These 300 offsite riparian plantings would be in addition to the number from the previous repairs to the Yakima Right and Left Bank repairs. The plantings would be placed by Yakima County using a stinger to place the vegetation in large cobble bars adjacent to the river.

7.3 FISH AND WILDLIFE

The Naches River system supports Middle Columbia River Evolutionarily Significant Units (ESU) spring Chinook (*Oncorhynchus tshawytscha*), Upper Columbia River ESU fall Chinook, summer steelhead (*O. mykiss*), and bull trout (*Salvelinus confluentus*), as well as several other salmonid and non-salmonid species. Both steelhead and bull trout are listed as threatened under the Endangered Species Act (ESA) which is discussed in Sections 7.4 and 11.1.5.

As discussed in Section 5.1, the altered hydrological conditions of the river has negatively affected aquatic species like steelhead, which have key life stage processes that no longer align with conditions under which they originally evolved. The unnatural fluctuation can displace and even injure or kill juvenile fishes that are not mature enough to maintain position in high river flows. Although flip-flop flows in the lower Naches may open access to side- and off-channel areas that could be used by fish, the rapid increase and decrease in flow can cause dewatering and stranding of fish.

Mammals in the upper Naches River are typical of species found in the eastern forested Cascade Mountains such as bighorn sheep (*Ovis canadensis*), American badger (*Taxidea taxus*), cougar (*Puma concolor*), bobcat (*Lynx rufus*), and black bear (*Ursus americanus*). In the lower Naches area, the habitat is dryer shrub-steppe which either does not support these species or does so at a smaller density than in the mountains. Ranges of some species overlap between the upper and lower Naches including elk (*Cervus elaphus*), the Townsend's ground squirrel (*Spermophilus townsendii*), mule deer (*Odocoileus hemionus hemionus*) and Columbian white-tailed deer (*O. virginianus leucurus*), coyote (*Canis latrans*), and various bat species.

Eastern Washington is part of the Pacific Flyway, and open areas such as the Naches River, are stopover locations for avian species. Water loving birds such as ducks, geese, herons, egrets, and grebes congregate in open water. Avian predators include bald eagles (*Haliaeetus leucocephalus*), golden eagles (*Aquila chrysaetos*), northern goshawk (*Accipiter gentilis*), and osprey (*Pandion haliaetus*), however no nests were observed near the project site. Notable bird species in the upper Naches include the dusky grouse (*Dendragapus obscurus*) and Flammulated owls (*Psilosops flammeolus*). While in the lower Naches burrowing owls (*Athene cunicularia*) and greater sage grouse (*Centrocercus urophasianus*) are found in shrub-steppe habitat.

7.3.1 No Action Alternative

Under the No Action Alternative, the site would continue to erode naturally in the damaged state, potentially resulting in increased turbidity, especially during a flood event and during a levee breach. A breach would result in inundation behind the levee with associated severe turbidity and potential pollution impacts to the river. Flood fight actions would likely be undertaken to prevent a breach and would likely include in-water work. Emergency actions would entail more in-water work and could have greater impact on fish and wildlife than a scheduled repair action. If no flood response is taken and no breach occurs or flood fight actions instigated, then natural processes would continue. This may result in additional riparian vegetation growth and undercut banks which would benefit fish and wildlife, but harm the structural integrity of the levee, increasing structural issues and the chance of future failure. The local sponsor would likely continue maintenance on the levee, stunting riparian growth according to its maintenance schedule.

7.3.2 Levee Setback Alternative

Under the levee setback alternative and assuming this alignment is within the developed location behind the existing levee, there would be a benefit for fish and wildlife, especially to those that utilize riparian and aquatic habitats. By setting back the levee, the river and riparian zone would have more

area to develop. An increase in river complexity and vegetation cover would provide more habitat for birds, fish, and mammals. However, the degree of this benefit is dependent on the extent and orientation of a levee setback. Construction related impacts would include noise, vibration, and possibly removal of vegetation. These impacts would be minimal and temporary, with vegetation disturbance being the longest lasting impact depending on setback alignment.

7.3.3 Repair In-Kind Alternative

Use of the site by fish and wildlife would be temporarily affected under this alternative. There would be short-term construction-related impacts during repairs such as noise, turbidity, and vibration which could impact how fish and wildlife utilize the area. Repair work could also deter wildlife from approaching and utilizing the area. Animals could also be directly affected by localized impacts from repair activities. Most impacts would be to the aquatic and riparian habitat.

Repairs to the riverward face of a levee simplifies the bank, such as areas of undercut bank and bank complexity at levee toes. This would reduce the quality of fish habitat, although existing conditions are poor to begin with as the shoreline is already leveed and existing complexity results primarily from the damaged condition. Effects of bank simplification would be minor as compared to existing conditions and would restore the bank to the pre-damage – or baseline – state, but would be enduring for the foreseeable future.

Construction-related (short-term) noise, vibration, elevated turbidity, and human activity are expected to displace fish temporarily, but within timing restrictions that aim to minimize effects to fish, primarily listed ESA species, during important life history periods. Impacts from in-water work may include elevated turbidity, physical disturbance, and noise from the excavation and placement of material that could result in interruption of foraging and migration behavior, elevated stress levels, and physical damage.

Elevated noise can result in a behavioral response and/or physical damage. There are thresholds established in the literature for the impacts of noise on fish. Noise generated by rock dumping is characterized as continuous (or non-pulsed), since the elevated sound pressure occurs over seconds (not milliseconds, as is the case with pulsed noise) (Agness, NMFS, pers comm., July 23, 2013). The following are noise thresholds for various forms of effects on salmonids for pile driving (which apply to both impact and vibratory) from NMFS. Note that vibratory pile driving is also considered continuous:

- 150 dB_{RMS}¹ for harassment for continuous noise² for fish of all sizes
- 187dB cumulative SEL³ for injury of fish ≥ 2 grams⁴
- 183dB cumulative SEL for injury of fish < 2 grams
- 206 dB_{peak}⁵ for injury of fish of all sizes

The following are noise thresholds based on Popper et al. 2014:

Continuous sound (drilling, vibratory pile driving, other noise activities that are not impulsive sound):

- For fish with swim bladders that are involved in hearing (e.g. minnows)

¹ Decibels root mean square over a period of time

² Vibratory pile driving is characterized as continuous noise

³ Decibels sound exposure level over a 24 hour period (cumulative)

⁴ Injury thresholds are based on pile driving (pulsed noise)

⁵ Peak sounds in decibels

- 170 dB_{RMS} for 48 hours for recoverable injury
- 158 dB_{RMS} for 12 hours for TTS (Temporary Threshold Shift, or complete recovery of hearing loss)
- There is no direct evidence for mortality or potential mortal injury for continuous noise.
- There are no continuous noise thresholds set for fish without swim bladders (sculpin) or those with bladders that are not involved in hearing (salmonids).

It is unlikely that noise thresholds would be exceeded during the placement of rock since riprap would not be end dumped in the river, but rather each rock would be individually placed, or in small bucket loads for smaller materials. Typical construction site noise ranges from 73 to 101 dB (WSDOT 2013) which is well below the injury thresholds for salmonids.

Any fish that do not leave the construction area during in-water work could be injured or killed by manipulation and placement of armor. Effects of noise, vibration and human activity would be temporary.

Potential project-induced effects to water quality, including temperature, dissolved oxygen, and turbidity are addressed in Section 7.6, but are expected to be minor. Activities in and near the water may elevate turbidity and suspended solids downstream and may affect ability of sight-feeding fish to locate prey. Very heavy silt loading, at much greater levels than which is expected to be produced by the repairs, can have adverse physiological effects to aquatic organisms. Physiological effects of increased turbidity can include gill trauma (Servizi and Martens 1987; Noggle 1978; Redding and Schreck 1987), and affect osmoregulation, blood chemistry (Sigler, 1988), growth, and reproduction. Behavioral responses include feeding disruption from olfactory and visual impairment (Sigler, 1988); gill flaring; and curtailment of territorial defense (LaSalle 1988). Turbidity would be monitored during in-water work and action taken to address turbidity if exceedances are detected.

Any sediment suspension, turbidity, and biochemical oxygen demand changes from levee repair would be of low intensity, local, and temporary. Effects to fish from water quality degradation are expected to be local and temporary.

Vegetation removal can be expected to have minor adverse effects to water quality parameters, to reduce organic input to the system, and to reduce nesting, foraging and cover for insects, mammals and birds. Due to the presence of mature riparian vegetation in the project area, those effects resulting from the removal of the vegetation are expected to be negative. However, onsite and offsite plantings would offset this negative impact.

The Repair In-Kind alternative would likely displace mammals in the area during construction, but no substantial short or long-term effects are expected. Confining work to the existing levee footprint and placement of staging and access routing in developed areas would minimize potential for impacts to mammals, birds, reptiles, and amphibians. Project impacts to wildlife are expected to be highly localized as similar habitats exist around the site in better conditions than at the levee. Repairing in-kind is not expected to significantly affect fish and wildlife populations. Impacts resulting in vegetation loss would be the most long lasting effect, but would likely be offset with plantings.

7.4 THREATENED AND ENDANGERED SPECIES

In accordance with Section 7(a)(2) of the ESA, federally funded, constructed, permitted, or licensed projects must take into consideration impacts to federally listed and proposed threatened or endangered species. Species and their critical habitat listed or proposed under the ESA in the project vicinity are listed in Table 1. Other listed species may occur in Yakima County (USFWS 2017), but are unlikely to occur in the action area and thus would not be affected by the proposed action. This is due

to their sensitivities to human encroachment, lack of suitable and critical habitat, or because their presence is so transitory that any temporal effects to these species from construction activities would not be perceived as unusual, cause disruption of behavior or lead to measurable reductions in their prey base. As such, no effects to these species or their critical habitat are expected and they will not be discussed further. These threatened (T) or endangered (E) species are: Canada Lynx (*Lynx canadensis*) (T), gray wolf (*Canis lupus*) (E), grizzly bear (*Ursus arctos horribilis*) (T), North American Wolverine (*Gulo gulo luscus*) (proposed T), marbled murrelet (*Brachyramphus marmoratus*) (T), and yellow-billed cuckoo (*Coccyzus americanus*) (T).

Table 1. ESA protected species listed in the project vicinity (NOAA 2006, USFWS 2017).

SPECIES	LISTING STATUS	CRITICAL HABITAT	CRITICAL HABITAT WITHIN PROJECT AREA?
Columbia DPS Bull Trout <i>Salvelinus confluentus</i>	Threatened	Designated (NOAA 2005)	Yes
Middle Columbia River Steelhead DPS <i>Oncorhynchus mykiss</i>	Threatened	Designated (USFWS 2010)	Yes

BULL TROUT

The Yakima River Core Area supports up to 15 local bull trout populations. The Ahtanum population is resident and located downstream of the project area. The remaining populations are fluvial and adfluvial and assigned to spawning tributaries in the Naches River and tributaries to three upper Yakima storage reservoirs operated by the Bureau of Reclamation (USFWS 2015). Population trends, based on basin redd counts, have ranged from recent highs of 700-800 redds (2008-2012) to lows of 400 redds in 2013-2015 (Mizell and Anderson 2015). The Naches River and its tributaries harbor a large portion of the bull trout in the Yakima River Core Area (USFWS 2015). The three populations of bull trout in the Naches River have averaged 80 redds per year (10 years, 2005-2014). Bull trout presence is known from the upper reaches of the Yakima and Naches river basin with rare sightings downstream to the Terrace Heights Bridge in Yakima, Washington (Mizell and Anderson 2015). Bull trout do not use the Naches River adjacent to the Yakima Right Bank levee for spawning, but do use the mainstem for forage, migration, and overwintering habitat. Spawning occurs in the tributaries of the Naches River (WDFW 2017).

Bull trout originating from the Naches River and its tributaries are the population most likely to be found in the project area. Occurrence is infrequent in the lower Naches River, but has been recorded during colder months when low water temperatures do not create a barrier. In winter, the Naches and Yakima Rivers provide foraging, migrating, and overwintering habitats for bull trout. During times of elevated water temperatures (above 18°C) bull trout are not expected to occur in mainstem river areas. In summer, bull trout remain in the upper reaches of the Naches River and its tributaries where water temperatures remain cold (Mizell and Anderson 2015). Thermal imagery shows high river temperatures in the mainstem Naches River in August (Figure 2). Summer temperatures on the mainstem Naches above the Tieton confluence can reach into the mid-70s°F (23°C), while tributaries are in the low to mid-50s°F (10-12°C) and mid-to-upper 40s°F on the spawning grounds. By late June to early July, most of the fish moved into their natal tributary streams and continued to move slowly upstream to spawning grounds (Mizell and Anderson 2015). In August, most bull trout are in cooler tributary spawning streams or in thermal refugia such as in the pool below the Wapatox Diversion Dam (Mizell and Anderson 2015).

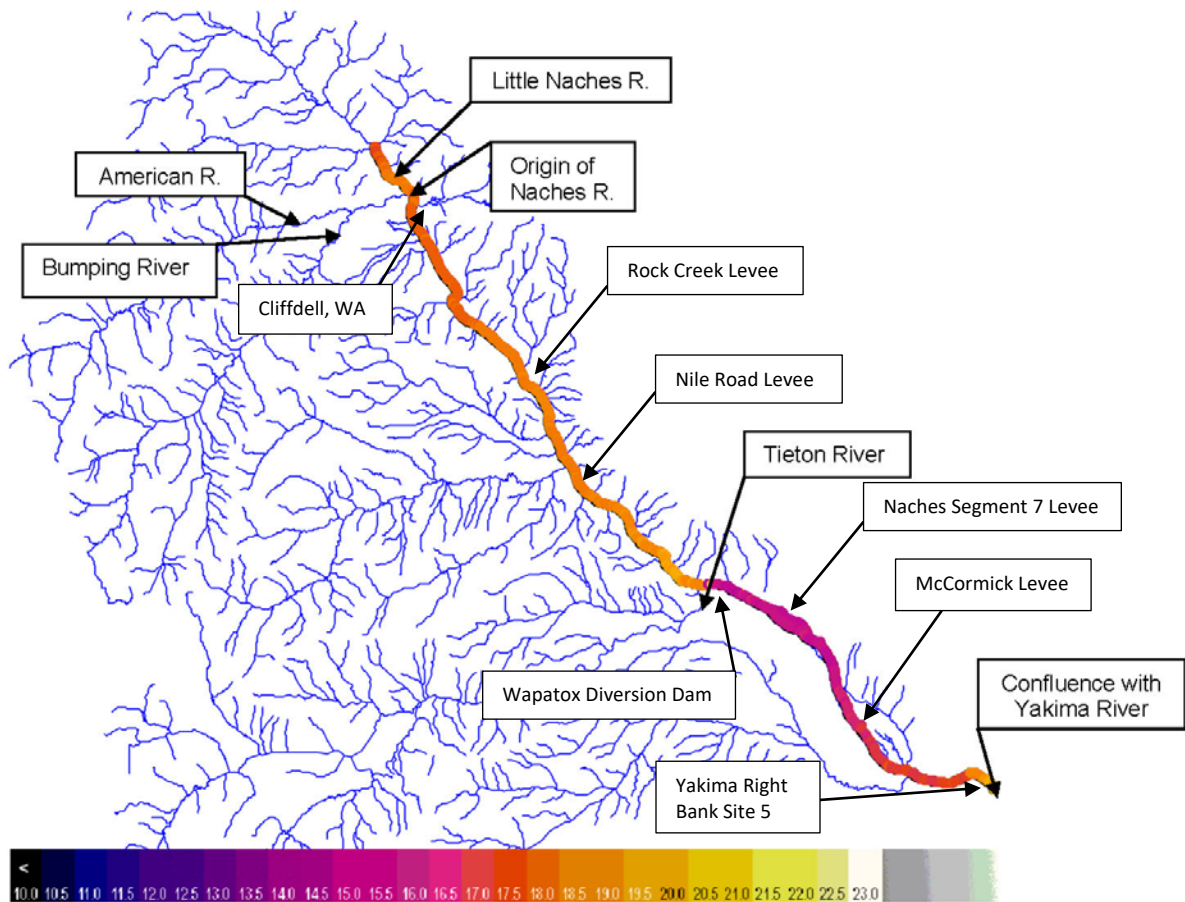


Figure 2. Thermal imaging overlay of the Naches River on August 2004 (Mizell and Anderson 2015). Major tributaries and approximate project locations are shown. Naches River temperatures below the Tieton drop due to the influx of colder water. Yakima Right Bank Site 5 is located upstream of the Naches-Yakima River confluence (bottom left corner).

A telemetry study by the Washington Department of Fish and Wildlife (WDFW) tracked bull trout movement in the Naches River basin (Mizell and Anderson 2015). The study noted upstream movement of pre-spawn fish in the lower to mid reaches of the Naches River beginning in late May to early July and downstream movement of post-spawners from October through December. Post-spawned fish settled into their over-winter locations in the mid to lower Naches River by December and stayed through March (Mizell and Anderson 2015). Over-wintering area comprises the entire mainstem Naches River and major tributaries, which serves as the primary foraging, migration and overwintering habitat for the entire Naches drainage bull trout population. Over-wintering primarily occurs in pools where the fish spend lengthy periods of time, generally moving very little after settling-in for the winter. WDFW identified a number of large pools in the mid to upper Naches River from the Wapatox Diversion Dam (RM 17.7) upstream to a pool near Cliffdale, WA (RM 40.5) as the prime wintering locations on the Naches.

MIDDLE COLUMBIA STEELHEAD

Generally, run timing is from November through April with a majority of steelhead adults crossing Prosser Dam between mid-September and November (CBR 2017). According to the Hockersmith study (as cited in YBFWRB 2009), after crossing Prosser dam, most steelhead overwinter in the Yakima River

between Prosser and Sunnyside dams in reaches with deep pools and low velocity. The final migration from holding areas to the spawning grounds begins between January and May (YBFWRB 2009). Spawning of Yakima summer steelhead occurs between March and May. Most spawning occurs in tributaries to the Yakima River. Steelhead fry typically emerge from river gravels from April through June or July, depending on tributaries (YSFWPB 2005). After spending 2 to 3 years rearing in freshwater, steelhead smolts outmigrate from the subbasin from early spring through June.

Juvenile steelhead rear in the mainstem of the Yakima River year-round. Between March and August irrigation withdrawals from the Naches reduces river flow and availability of juvenile rearing habitat. Then in late August through September flow rapidly increases as the Tieton Dam gates are opened, flushing early juvenile steelhead downstream. This rapid increase in flow in the Tieton and lower Naches rivers displaces and may even injure or kill steelhead fry or small juveniles, which are not large enough to maintain their position in high river flows. As a result, most rearing occurs in the Yakima River rather than the Naches.

The 2017 run of steelhead returning to Yakima River, 1,600 counted at Prosser Dam, was less than half the number the year before and the lowest number in more than a decade. The general thought is that recent declines in the steelhead returns are due to droughts in 2014 and 2015, along with warming ocean temperatures (Yakima Herald 2017).

7.4.1 No Action Alternative

Under the levee setback alternative, impacts to ESA listed species would be similar to those impacts discussed above to fish and wildlife. If an emergency flood fight action is taken at the site during flooding, in-water work is likely to occur and could potentially affect listed aquatic species depending on the extent, type, and timing of the action. In-water impacts are discussed further below in Section 7.4.3.

7.4.2 Levee Setback Alternative

Under the levee setback alternative, impacts to ESA listed species would be similar to those impacts discussed above to fish. A setback would be a benefit to bull trout and steelhead by increasing the floodplain width and complexity. A setback would likely result in more overhanging vegetation as the riparian area reestablishes, reducing temperatures to lower levels during summer and providing organic input for prey items. Some minor impacts may occur where the setback requires work in bull trout critical habitat. Overall, impacts to ESA listed species is expected to be minor and primarily beneficial under this alternative.

7.4.3 Repair In-Kind Alternative

Impacts under this alternative would be similar to those described in Section 7.3.3.

BULL TROUT

Construction-related effects from the proposed repairs could result from deconstructing the damaged levee sections and rebuilding. Such activities are typically related to using an excavator to remove or place rock. Effects resulting from this are mostly temporary and local, and include noise, vibration, turbidity, and potential physical harm to fish in the area. Longer lasting impacts include removal of vegetation.

Rock placement could cause injury or death if an individual is within the repair location at the time of material placement or removal; however, such an event is expected to be rare. Disturbance from elevated turbidity and noise is also likely if bull trout are present. Most bull trout in the mainstem Naches are larger and able to rapidly swim away from sources of disturbance or would not be present during parts of the year due to high temperatures. Whether it is injured or not, rock placement could

disturb and displace such an individual if in the immediate vicinity of the action. No bull trout fry are expected to be affected as they occur in spawning areas outside of the project area. Juvenile and adult bull trout could be found rearing in the river near the site during low temperature periods, such as at construction. However, there is low likelihood of bull trout presence in the project area during the repair due to its location at the lower range of recorded bull trout range in the Yakima River basin. By 15 October bull trout have spawned and started moving out of their spawning locations to move to overwintering habitat. A WDFW study (Mizell and Anderson 2015) examined migratory behavior and habitat use of the Yakima River basin bull trout population and identified the overwintering period ranging from November through March. This study identified the mid- to upper Naches River from the Wapatox Irrigation Diversion and upstream as the prime wintering locations for bull trout. Only two bull trout were detected below Wapatox dam, the lowest of which was detected just downstream of Naches, Washington, well outside of the proposed repair site.

Most bull trout are expected to be overwintering above the Wapatox diversion dam. Therefore, increases in sediment and noise disturbance during construction activities are expected to result in discountable effects to bull trout. If bull trout were to be present within the project area the impacts would be similar to those described further below.

Disturbance from vibration and noise from the movement of heavy construction equipment or delivery and placement of rock could also occur (see Section 7.3.3). Van Derwalker (1967) found that steelhead responded maximally to sounds between 35 and 170 Hz, but the fish did not move more than 60 cm from the sound source. Construction-generated vibration would be in a low-frequency range, and salmonids may be able to hear only in low ranges (Hawkins and Johnstone 1978). Abbott (1972) observed no response at 600 Hz in rainbow trout which otherwise responded generally to signals at 150 and 300 Hz. It is possible that vibrations below the hearing range of salmonids would still be perceived and might elicit a startle response. Hawkins and Johnstone (1978) said that Atlantic salmon were sensitive to sounds transmitted through substrate in a river environment. Vibration and noise could cause any fish in the area to move away from the construction zone. Repeated events, which are likely to occur here during in-water work, may either scare the fish away from the project area or cause prolonged stress.

Bank excavation and placement of rock in the water may lead to elevated turbidity levels downstream. Suspension of sediments can increase biochemical oxygen demand, and reduce dissolved oxygen levels in the water. Bull trout may be naturally exposed to some elevation in suspended sediment levels in streams carrying heavy sediment loads (Gregory and Northcote 1993). Therefore, it is not inevitable that salmonids would suffer major impacts from such levels of turbidity, but ideal conditions tend toward lower turbidity levels. However, the Naches River is relatively clean of sediment in its upper forested reaches but worsens as it moves into developed areas and mixes with discharges from streams, agricultural drains, and runoff. For the proposed levee repair, clean rock would be used and turbidity monitoring would occur during project construction (see BMP 11 and Appendix C). Similar levee repairs have been closely monitored in the past without any exceedance. If rain occurs during construction, it is possible that soil could be washed into the river. Best management practices would then be employed for erosion control. However, any turbidity generated is expected to stay close to shore, and not permeate throughout the entire channel, leaving most of the river free from impact.

The temporary loss of riparian vegetation could decrease organic input to the river and decrease shading. Loss of riparian vegetation negatively impacts foraging opportunities from insect fall for fish that fish preyed on by bull trout or juvenile steelhead forage on. This loss would be offset by onsite and offsite plantings. Growth in good conditions can reach 6-8 feet a year for willows. Additionally, any

woody debris generated by the repair would be placed along the toe of the repair so that it can provide additional cover and organic input within the basin.

MIDDLE COLUMBIA STEELHEAD

Impacts to steelhead are similar to those of bull trout. This includes construction related effects from the proposed repair causing noise, vibration, turbidity, and potential physical harm to fish in the area from rock placement/removal. Longer lasting impacts include removal of vegetation.

As with bull trout, impacts to steelhead depends on location and timing of the repair. Repairs in autumn (15 October to 30 November) would occur after flip-flop during a time when water levels have decreased and juvenile steelhead have been washed out/migrated into the Yakima River. This time period also occurs when adult steelhead are overwintering between Prosser and Sunnyside dams in areas with deep pools and low velocity, therefore, adults are not expected to be present during repairs.

7.5 CULTURAL RESOURCES

The Corps has coordinated its environmental review of impacts on cultural resources for NEPA with its responsibilities to take into account effects on historic properties as required by Section 106 of the National Historic Preservation Act (NHPA). The Corps has determined and documented the area of potential effects (APE) for both direct and indirect effects, as required at 36 C.F.R § 800.4 of the regulations implementing Section 106. The APE includes the length of the repair and all staging and access areas. The Corps conducted a record search and literature review of information on file in the Corps' cultural resources library and at the Washington State Department of Archaeology and Historic Preservation. A Corps archaeologist also conducted a field investigation of the APE on 16 October 2017; and the Confederated Tribes and Bands of the Yakama Nation were notified about the undertaking to identify properties to which they may attach religious or cultural significance or to voice other concerns with historic properties that may be affected. The Yakama Nation did not comment on the undertaking. During the cultural resource survey only one cultural resource, the levee itself, was identified. The Corps determined that the levee was not eligible for inclusion on the National Register of Historic Places (NRHP). The results indicate that there are no historic properties eligible for listing on the NRHP within the APE. The Corps has consulted with the Washington State Historic Preservation Officer (SHPO) and the Confederated Tribes and Bands of the Yakama Nation for this undertaking.

7.5.1 No-Action Alternative

Under this alternative, the Corps would not repair the levee. Future flooding events or the emergency actions taken for flood fighting could result in the erosion or destruction of cultural resources within the floodplain protected by the levee. Uncontrolled flooding could cause erosion, structural damage to, and/or inundation of historic properties—both previously described and as of yet unknown.

7.5.2 Levee Setback Alternative

Levee setback would push the levee from its original and historic footprint. Setback would require survey of the footprint to determine what is and is not eligible under NRHP. Structural complications aside, levee setback may require new groundbreaking in an area where both historic and prehistoric archaeological artifacts and/or features may be found. It is possible that levee setback would result in adverse effects to historic properties and require extensive consultation and mitigation efforts.

7.5.3 Repair In-Kind Alternative

Based on a records search, literature review, and the result of field investigation, no NRHP-eligible historic properties have been identified in the APE. As a repair in-kind, the levee would be restored to its original appearance and function. No damage to cultural resources would be expected, and

restoration of function would prevent potential flood damage to unknown cultural resources in the lands protected by the levee.

7.6 WATER QUALITY

A Total Maximum Daily Load (TMDL) study identifies pollution problems in the watershed, and then specifies how much pollution needs to be reduced or eliminated to achieve clean water. In Washington, the Washington Department of Ecology (Ecology), with the assistance of local governments, agencies, and the community develops a plan that describes actions to control the pollution and a monitoring plan to assess the effectiveness of the water quality improvement activities. A Water Quality Improvement (WQI) project report consists of the TMDL study and implementation plan.

Areas within the upper Naches River have impairment problems with water temperature and are being resolved by Ecology under an EPA-approved TMDL. These waters are designated as Category 4A by Ecology and have an approved WQI project to improve conditions.

In the lower Naches River, stretches are designated as Category 5 waters (Ecology 2018a). This category means that the water quality standards have been violated for one or more pollutants and does not have an Environmental Protection Agency (EPA) approved TMDL or WQI project in place. Near the cities of Naches and Glee, the river is designated as a Category 5 for temperature. Near the confluence with the Yakima River, the Naches River is also designated as Category 5 for pH.

Beside temperature and pH a wide variety of other parameters are tested for in waters of the state. These include, but are not limited to turbidity, bacteria, arsenic, lead, and a wide range of other elements and chemicals. While these are present and listed as Category 4 or 5 throughout the state no areas are designated as such in the Naches River.

7.6.1 No Action Alternative

Water quality would continue to progress along current trends under this alternative. The existing upper Naches River WQI project would progress to improve temperature issues and any work towards implementation of a WQI project to address lower Naches TMDLs for temperature and pH would continue as is. However, taking no action to repair the damaged levee may lead to emergency flood fight measures during flood events. Such action may repair the levee but is not expected to worsen water quality in the long-term. Nor is it expected to promote the listing of additional parameters. However, water quality may be negatively affected during emergency repairs, such as turbidity, but these would be temporary and possibly lost in flood water conditions. Conversely, flood fights are not expected to contribute to improving water quality. If no flood fight actions are taken, or if flood damage is significant enough, the levee may breach. This would cause flooding and potentially worsen existing water quality conditions with the influx of whatever contaminants may be located in the flooded areas. The degree to which water quality could worsen is dependent on the flood severity, when and where a breach could occur, and the kind of response to the flooding taken at the damaged site. During flood fights or a breach turbidity is expected to temporarily increase during the event. Additionally, the amount of riparian vegetation removed could impact water temperatures. Riparian vegetation provides shade, blocking solar energy that would otherwise be absorbed into the water causing increases in temperature. Riparian vegetation also creates thermal microclimates that generally maintain cooler air temperatures, higher relative humidity, lower wind speeds, and cooler ground temperatures along stream corridors. Mature riparian vegetation, such as tall cottonwood and conifers, removed from emergency flood fight actions may have a significant effect on water temperature due to shade reduction, increasing direct solar input. Lower stature vegetation, like that found at the repair site,

generally provide less shade and their removal would impact the thermal microclimate to a greater degree than direct shade.

7.6.2 Levee Setback Alternative

Setbacks are widely regarded as beneficial as they restore natural conditions, such as a wide floodplain, and allows for more room for vegetation to establish and removal of bare rock from the shoreline. A setback would likely improve water quality in the project area considering that water temperature is the primary contaminant of concern, however, the degree of improvement is dependent on a setback's alignment. Water quality issues during construction are expected to be minimal as most work would occur landward and vegetation impacts are likely minimal. Runoff would be controlled and not expected to worsen.

7.6.3 Repair In-Kind Alternative

Impacts to water quality under this alternative would likely resemble those of the No-Action Alternative if a flood fight occurs. Repairs would remove existing vegetation within the repair footprint and return the levee slopes to an undamaged condition. Removing riparian vegetation during repairs would increase the amount of warming to the river. However, the degree to which this would occur is unknown and would be offset with the plantings incorporated into the project plan. During repairs any in-water construction could cause a short and temporary spike in turbidity. Cleared vegetation may also increase runoff potential, but this would be addressed by conservation measures and during construction by BMPs. Any change to water quality is expected to be minimal and temporary.

7.7 AIR QUALITY AND NOISE

The Clean Air Act requires EPA to set standards for air quality, regulating pollutants that are considered harmful. Areas of the country where air pollution levels persistently exceed the National Ambient Air Quality Standards (NAAQS) are designated as "non-attainment" areas. The EPA sets *de minimis* threshold levels for six common air pollutants: ozone, carbon monoxide, nitrogen dioxide, particulate matter (solid and liquid particles suspended in the air), sulfur dioxide, and lead. Areas that do not meet the minimum threshold levels are designated non-attainment areas. Washington meets the NAAQS across the state but 12 communities are at risk of violating standards (Ecology 2018b). The areas at risk are shown below in Figure 3.

Maintenance areas are areas that were classified as non-attainment but which are now consistently meeting the set standards, and as such have been designated as attainment areas with a maintenance plan. There are currently 10 maintenance areas in the state, two of which are in Yakima for particulate matter and carbon monoxide. While these two maintenance areas are in-compliance with NAAQS, they continue to be under maintenance plans for 20 years. The project area partially overlaps with the maintenance area for particulate matter. The maintenance plan for this area focuses on stationary sources, residential wood combustion, paved and unpaved roads, fugitive dust, and on-road and off-road mobile sources. The end of the 20 year period for it is 10 March 2025 (EPA 2018).

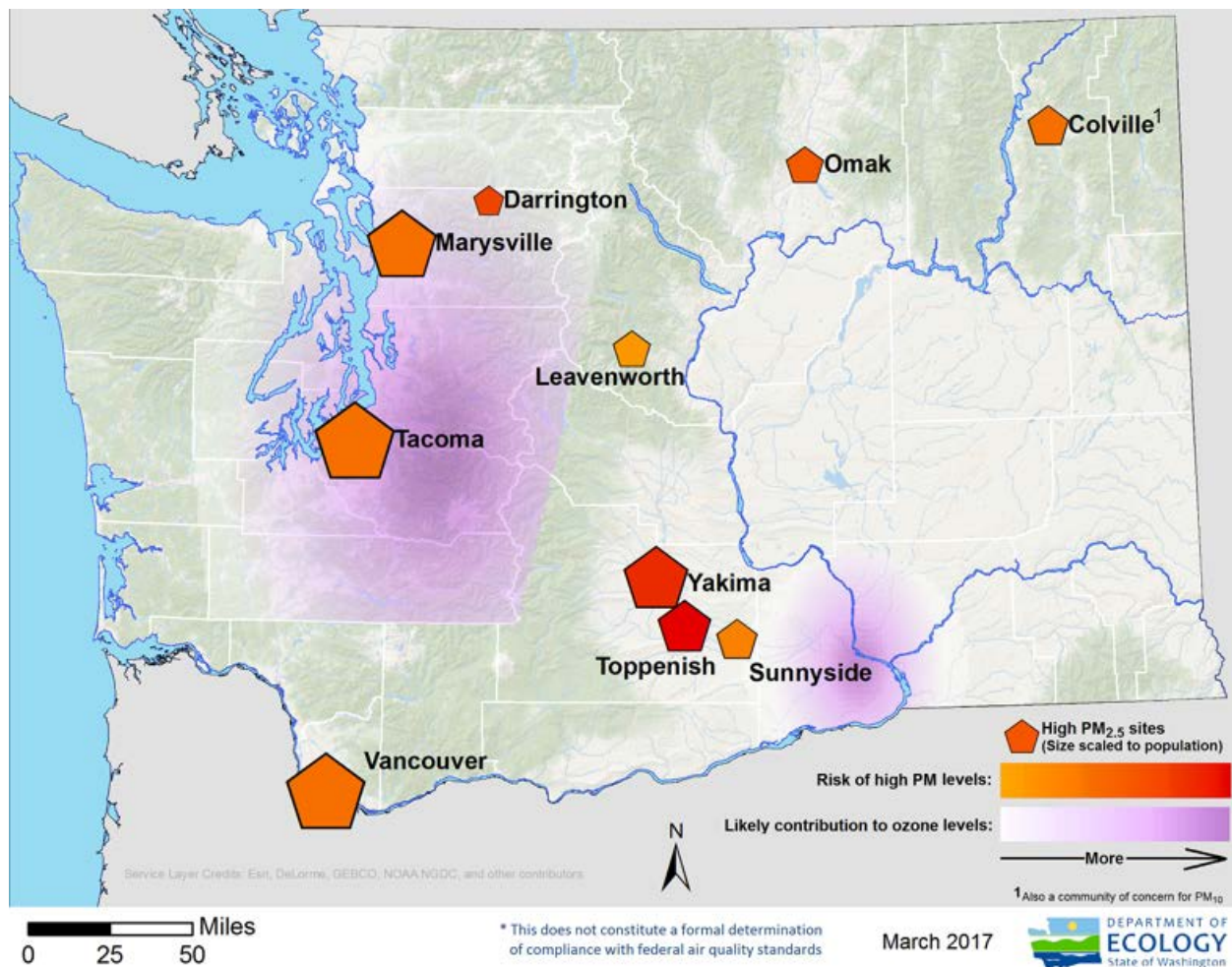


Figure 3. Areas of Washington at risk of not meeting air quality standards for particulate matter (pentagons) and ozone (purple shading)(Ecology 2018b).

The Clean Air Act also designates noise as a pollutant. Noise becomes a pollutant when it either interferes with normal activities such as sleeping, conversation, or disrupts or diminishes the quality of life. While noise is generated from a variety of sources, the largest source at the repair site is expected to be related to traffic and vehicle noises.

7.7.1 No Action Alternative

The No-Action Alternative would have no direct effect on air quality or noise. However, taking no action to repair the damaged levee may lead to emergency flood fight measures during flood events. While it is not possible to accurately predict the amount of emissions and noise generated for an unknown event and extent of damage, it is assumed that effects to air quality and noise would be similar to past repairs. This means that impacts to air quality would be temporary and are unlikely to exceed *de minimis* thresholds for attainment zones, and therefore would not require a conformity determination under 40 CFR 93.153(c)(2)(iv). A temporary increase in noise during night hours could occur if flood fight activities require night work to address the situation. Effects from noise would also be temporary and consist of construction related sounds at variable intensity.

7.7.2 Levee Setback Alternative

Emissions from construction activities such as material placement, compaction, and hauling are estimated using emission factors from the Off-Road model (AQMD 2018). This model contains emission factors for calculating emissions from construction equipment. The emission factors, type and number of equipment and the length of construction were used in calculating construction emissions for the repair. The results of this analysis and comparison with emission thresholds for maintenance areas per 40 CFR 93.153(b)(2) are shown in Table 2. Like past levee repairs, increases in emissions resulting from a levee repair would remain well below the *de minimis* thresholds for non-attainment zones and clearly would be exempted by 40 CFR Section 93.153(c)(2)(iv) from the conformity determination requirements. Unquantifiable but minor exacerbation of effects of carbon dioxide and other greenhouse gas (GHG) emissions on global climate change would be anticipated. Although GHG emissions associated with this alternative are not expected to significantly increase the rate of climate change and sea level rise, fuel consumption from construction activities are a part of world-wide cumulative contributions to change in climate by way of increases in greenhouse gas emissions. In addition, equipment such as dump trucks and excavators would have mufflers and exhaust systems in accordance with state and Federal standards.

Impacts from noise would be similar to that under a flood fight as described in the No Action Alternative. However, all construction would take place during daylight hours to avoid disturbing local residents and businesses. All noise impacts would be temporary.

Table 2. Combined estimated emissions for a levee setback repair.

	Metric Tons per Year					
	NO ₂	SO _x	CO	VOC	PM ¹	GHG ²
Construction	2.8	0.005	1.8	0.4	0.1	548.8
Threshold	100	100	100	100	100	25,000 ^a

¹PM2.5 and PM10 are combined in this table. Each is regulated at 100 tons/year for emissions.
²Green House Gases (GHG) represents the sum of carbon dioxide and methane.
^aCEQ benchmark of 25,000 metric tons total (Sutley 2010).

7.7.3 Repair In-Kind Alternative

Impacts to air quality and noise would be similar to the Levee Setback Alternative above, remaining below threshold levels. Construction would remain well below *de minimis* thresholds for maintenance areas and comply with the maintenance plans developed for particulate matter and carbon monoxide and exempted by 40 CFR Section 93.153(c)(2)(iv) from the conformity determination requirements. Additionally, noise impacts would be similar, resulting in temporary noise increases during daylight hours. No significant negative effects are expected.

7.8 UTILITIES, PUBLIC SERVICES AND RECREATION

No utilities such as electricity, phone, and water are known within the levee footprints. However, utilities are known to exist behind the levee and service residential, infrastructure, and businesses nearby. A utility locate would be requested prior to construction within the project footprint to ensure that none would be affected. The levee provides flood risk reduction for major roads, including U.S.

Route 12 which provides an important connection between Yakima, King, and Pierce counties. People and goods utilize this road to transport goods and services. Additionally, the Yakima Greenway trail is a 10-mile-long walking and biking path that runs along top of the levee in the project area. The levee also protects transportation connections between population centers and recreational areas such as the Mount Rainier National Park and Pacific Crest Trail. The river also is a source of recreation for watercraft; however, the levee does not support boating access.

7.8.1 No Action Alternative

No impacts to utilities, public services, and recreation would occur under this alternative unless a flooding event requires flood fight action or is breached. During flood fight actions, vehicles and equipment associated with the action could disrupt local traffic. Increases in traffic would be localized and of short duration, with no long-term impacts. If utilities were disturbed during repairs they would be replaced. If an emergency action is not implemented in time or is not sufficient, a breach in the levee could cause significant impacts to these resources, such as road closures or power outages. Recreation is not expected to be affected by flood fighting activities except for temporary closures during flooding and flood fight actions. Long-term damage to these resources could occur if a breach develops by destroying utilities or blocking transportation to recreational sources.

7.8.2 Levee Setback Alternative

Impacts to utilities, public services, and recreation would depend on the extent and alignment of a new setback levee. For example, a setback may require moving power poles from one location to another, or altering existing roads. During construction activities, vehicles and equipment may disrupt local traffic due to merging, turning and traveling together. Utilities and transportation could be affected but would be replaced or rerouted. Recreational use on top of the levee would also be interrupted during construction and most likely be different from its current condition after a setback is completed. However, any setback would likely address this by rerouting the path or integrating it into the new setback. Transportation to and from recreational areas could also be disrupted if those transportation routes are affected by construction. Boaters passing the levee may experience elevated noise, but this is not expected to be significant.

7.8.3 Repair In-Kind Alternative

No utilities are known to occur within the existing levee footprints or the proposed setback alignments which could be affected by the Repair In-Kind Alternative. A utility locate would be implemented to ensure avoidance, and if it is discovered that utilities are disturbed or destroyed, they would be avoided or replaced. No public services other than minor traffic impacts would likely result from the repair. Only temporary impacts to recreation are expected as repairs would close trail use during the duration of the repair and the trail surface would be replaced if damaged. Signs, cones, and other markings would be used to detour recreational trail users during the repair. No significant effects to utilities, public services, and recreation are expected from this alternative.

7.9 LAND USE

The Naches basin is predominantly rural. Areas of the floodplain are developed with residential, transportation, and recreation facilities centered on towns like Naches. Ownership is largely private, with government ownership in the upper and lower reaches. The Yakima Right Bank River protects the City of Yakima, the major city in the region. Immediately behind the levee are residential and business facilities.

7.9.1 No Action Alternative

Under this alternative, the current damaged state of the levee does not provide designed level of flood protection. Therefore, a higher risk exists for flood damage to the surrounding area. Failure to repair the levee could impact flood insurance rates in the protected area, which in turn could impact land use, especially for residential and retail areas. If the levee is breached during a flood event, the extent and location may change how the land is used. However, it is expected that an emergency flood fight action would occur prior to this happening, and if successful, land use would not change.

7.9.2 Levee Setback Alternative

The impacts to land use would be dependent on the scope of the setback. Transportation routes would likely remain in place, however, residential and commercial property could be altered. Any land riverward of the new levee would likely be changed to undeveloped lands and restricted from further development, while the land within the footprint of the new setback alignment would be removed from its previous use.

7.9.3 Repair In-Kind Alternative

Impacts to land use under this alternative would likely resemble those of the No-Action Alternative if a flood fight, but no breach, occurs. Repairs would return the levee to an undamaged state and retain existing land use.

8 UNAVOIDABLE ADVERSE EFFECTS OF THE PREFERRED ALTERNATIVE

Unavoidable adverse effects associated with the Repair In-Kind Alternative would be: (1) temporary and localized increases in noise, activity, and emissions which may affect fish and wildlife in the area; (2) temporary and localized disruption of local traffic by construction activity and vehicles; (3) irretrievable commitment of fuels and other materials for repairs; (4) temporary and localized increase in turbidity levels during in-water construction which may affect aquatic organisms in the area; (5) removal of vegetation from within the proposed construction area in the riparian zone. The vegetation removal has the longest duration of impact due to the length of time needed for onsite plantings to grow to a similar size and possible future vegetation maintenance that could stunt growth on these plantings if taken by the local sponsor. To offset these impacts, offsite plantings are also being planted which are not under rigorous levee vegetation maintenance standards.

9 CUMULATIVE EFFECTS

Cumulative effects include effects resulting from future Federal, State, tribal, local or private actions that are reasonably foreseeable to occur in the project area.

The Yakima River Basin, which includes the Naches River, has been substantially modified in the last 150 years. Dams, levees, irrigation projects and other water extraction and control projects have confined the river, impacted water quality, and altered flows. Riparian habitat has been lost, side channel and other floodplain features have been cut-off, and salmonid populations have steeply declined. The proposed repair contributes to these impacts. Site 5, and all other recent Yakima Right and Left Bank levee repairs have removed and affected vegetation cover along more than 10 percent of the combined length of the two levee systems.

As the local non-Federal sponsor, Yakima County continues to maintain the levee system and conducts periodic repairs and vegetation maintenance to the levees it oversees. These actions by the local sponsor maintain the *status quo*. Future flooding on the Naches River and its tributaries would be likely to damage Federal and non-Federal structures. Non-Federal entities would likely undertake at least

some repair actions under those circumstances and may seek Federal assistance with repairs or emergency responses. In May 2018 the Naches River again experienced high flows. It is possible that additional damage sites were created by this event and the local sponsors could request Federal assistance from the Corps for additional repairs. If the Corps determines that the damages are eligible for assistance under the Public Law 84-99 Levee Rehabilitation Program then additional repairs would take place. The scope and effects of those actions would likely be similar to those of the present action.

Future projects of larger scope in the Yakima River basin are likely to include aspects of, or be driven by habitat mitigation and enhancement features. The U.S. Bureau of Reclamation, in partnership with Ecology and other partners developed measures that would restore and enhance habitat in the river basin. The integrated plan identified measures that would substantially modify the Yakima River. Those measures would include actions to:

- Improve fish passage
- Floodplain improvements
- Channel reconnection
- Implement structural and operational changes at dams, canals, and other water control features
- Increase surface water and groundwater storage capacity
- Protect and enhance habitat

Plans for specific actions are being spun off the integrated plan. One of them is the *Yakima River at Union Gap, WA Ecosystem Restoration Project* (USACE 2014). This has developed into a large-scale levee setback and riparian restoration project, located in Yakima, proposed under the Section 1135 ecosystem restoration authority. Other future actions are likely to incorporate measures identified in the integrated plan, including set back levees that would restore or improve channel and habitat inter-connectivity (Yakima County 2014).

Repair to the Site 5 levee, as addressed in this Supplemental EA, would maintain but not appreciably add an increment of ecological losses in the active floodplain. When evaluated in the context of past, present, and reasonably foreseeable future actions, the proposed project would not result in significant incremental effects when considered in conjunction with other past and present actions, and future anticipated activities.

10 COORDINATION

The following agencies and entities have been contacted in the environmental coordination of this project:

- U.S. Fish and Wildlife Service
- National Marine Fisheries Service
- Confederated Bands and Tribes of the Yakama Nation
- Washington Department of Ecology
- Washington State Historic Preservation Officer
- Yakima County

A Notice of Preparation for this Supplemental EA for the proposed rehabilitation of Site 5 (PME-17-10) was issued on 29 September 2017. One comment was received from the Washington Department of Fish and Wildlife (Appendix D).

11 ENVIRONMENTAL COMPLIANCE

11.1 FEDERAL STATUTES

11.1.1 Native American Tribal Treaty Rights

The Federal trust responsibility to Native American Tribes arises from the treaties signed between Tribes and the U.S. Government. Under Article VI, Clause 2 of the U.S. Constitution, treaties with the Tribes are the supreme law of the land, superior to State laws, and equal to Federal laws. In these treaties, the United States made a set of commitments in exchange for tribal lands, including the promise that the United States would protect the tribe's people. The Supreme Court has held that these commitments create a trust relationship between the United States and each Treaty Tribe, and impose upon the federal government "moral obligations of the highest responsibility and trust." The scope of the Federal trust responsibility is broad and incumbent upon all Federal agencies. The U.S. government has an obligation to protect tribal land, assets, and resources that it holds in trust for the Tribes, and a responsibility to ensure that its actions do not abrogate Tribal treaty rights.

In the mid-1850s, the United States entered into treaties with many Native American tribes in the Northwest. These treaties guaranteed the signatory tribes the right to "take fish at usual and accustomed grounds and stations . . . in common with all citizens of the territory" [U.S. v. Washington, 384 F. Supp. 312 at 332 (WDWA 1974)]. In U.S. v. Washington, 384 F. Supp. 312 at 343 - 344, the court resolved that the Treaty tribes had the right to take up to 50 percent of the harvestable anadromous fish runs passing through those grounds, as needed to provide them with a moderate standard of living (Fair Share). Over the years, the courts have held that this right comprehends certain subsidiary rights, such as access to their "usual and accustomed" fishing grounds. More than de minimis effects to access to usual and accustomed (U&A) fishing area may violate this treaty right [Northwest Sea Farms v. Wynn, F. Supp. 931 F. Supp. 1515 at 1522 (WDWA 1996)]. In U.S. v. Washington, 759 F.2d 1353 (9th Cir 1985) the court indicated that the obligation to prevent degradation of the fish habitat would be determined on a case-by-case basis. The Ninth Circuit has held that this right encompasses the right to take shellfish [U.S. v. Washington, 135 F.3d 618 (9th Cir 1998)].

The proposed project has been analyzed with respect to its effects on the treaty rights described above. Project information was sent to the Yakama Nation. No comments were received.

The proposed repair is limited to the landward slope of the levee. With the proposed design, the Corps believes the following:

1. The work would have no impact on access to usual and accustomed fishing and gathering areas;
2. The work would not cause the degradation of fish runs in usual and accustomed fishing grounds or with fishing activities or shellfish harvesting and habitat; and
3. The work would not impair the Treaty tribe's ability to meet moderate living needs.

11.1.2 Bald and Golden Eagle Protection Act

The Bald and Golden Eagle Protection Act (16 U.S.C. 668-668d) prohibits the taking, possession or commerce of bald and golden eagles, except under certain circumstances. Amendments in 1972 added penalties for violations of the Act or related regulations.

No take of bald or golden eagles is expected resulting from repairing the levee In-Kind. No mature trees that are known to be used for nesting or roosting would be removed. There is no known nesting in the project vicinity. Eagles in the area are expected to be acclimated to human presence and noise and as such, the construction is not expected to disrupt eagles in the area.

11.1.3 Clean Water Act

The Clean Water Act (CWA) is the primary legislative vehicle for Federal water pollution control programs and the basic structure for regulating discharges of pollutants into waters of the United States. The CWA was established to “restore and maintain the chemical, physical, and biological integrity of the nation’s waters.” The CWA sets goals to eliminate discharges of pollutants into navigable waters, protect fish and wildlife, and prohibit the discharge of toxic pollutants in quantities that could adversely affect the environment. The many sections of the CWA address different types of discharges into waters of the United States. Three sections of the CWA could be pertinent to the proposed action: Section 401 covers water quality standards and evaluation of the effects discharges would have on those standards, Section 402 addresses stormwater runoff from disturbed areas, and Section 404 addresses discharge of fill. Requirements of those three CWA sections are briefly discussed below.

Sections 404 and 401: The CWA exempts some activities from Section 404 jurisdiction. Among the exemptions is 33 USC 1344(F)(1)(B), which provides that discharge of material “for the purpose of maintenance, including emergency reconstruction of recently damaged parts, of currently serviceable structures such as dikes, dams, levees, groins, riprap, breakwaters, causeways, and bridge abutments or approaches, and transportation structures” is exempt from regulation as fill. Pursuant to the definition at 33 CFR 323.4(a), the preferred alternative would constitute maintenance, which extends to reconstruction of levees, that does not consist of any modification that changes the character, scope or size of the original fill design. The preferred alternative would thus be exempt from regulation under Section 404; because the proposed action is exempt from Section 404, a water quality certification under Section 401 is not required.

Section 402: Section 402 of the CWA is triggered when a construction site would have greater than 1 acre of ground disturbance. Repairing Yakima Right Bank Site 5 would cause less than 1 acre of ground disturbance. A Section 402 permit is not required.

11.1.4 Clean Air Act

The Clean Air Act requires states to develop plans, called State Implementation Plans (SIP), for eliminating or reducing the severity and number of violations of NAAQS while achieving expeditious attainment of the NAAQS. The Act also requires Federal actions to conform to the appropriate SIP. An action that conforms with a SIP is defined as an action that would not: (1) cause or contribute to any new violation of any standard in any area; (2) increase the frequency or severity of any existing violation of any standard in any area; or (3) delay timely attainment of any standard or any required interim emission reductions or other milestones in any area.

The Corps has determined that the project constitutes routine facility repair generating an increase in emissions that is clearly *de minimis* (see Section 7.7), and thus a conformity determination is not required, pursuant to 40 CFR 93.153 (c)(2)(iv).

11.1.5 Coastal Zone Management Act

The proposed repair is not in a coastal management zone and would not affect the uses or resources of any federally recognized coastal management zone.

11.1.6 Endangered Species Act

The Endangered Species Act (16 U.S.C. 1531-1544), amended in 1988, establishes a national program for the conservation of threatened and endangered species of fish, wildlife, and plants and the habitat upon which they depend. Section 7(a) of the ESA requires that Federal agencies consult with USFWS and NMFS, as appropriate, to ensure that proposed actions are not likely to jeopardize the continued existence of endangered or threatened species or to adversely modify or destroy designated critical habitats. The Corps submitted a Biological Assessment (BA) documenting the effects of the proposed repair to listed species on 20 April 2018 to USFWS and NMFS to initiate consultation. On 1 May 2018 USFWS concurred with the Corps determination of not likely to adversely affect listed species or designated critical habitat within the jurisdiction of USFWS. On 2 May 2018 NMFS sent an email requesting additional information and proposing changes to the proposed project. The Corps prepared a response and sent it back to the NMFS on 21 May 2018. On 25 June 2018 the Corps received a Biological Opinion (BO) from NMFS completing consultation. The BO Incidental Take Statement contained a list of reasonable and prudent measures (RPMs) and terms and conditions. Of the 13 terms and conditions, implementation at Site 5 of one need not be conducted as planting willow stakes in the orientation and at the depth specified would constitute an alteration of the basic design of the action and would entail more than only minor changes in the design, and is thus not necessary and appropriate. The Corps response to the RPMs and terms and conditions are found in Appendix E. RPM 2, term and condition (e) is the condition the Corps would not be able to implement at Site 5.

11.1.7 Magnuson-Stevens Fishery Conservation and Management Act

The Magnuson-Stevens Fishery Conservation and Management Act (MSA), (16 U.S.C. 1801 et. seq.) requires Federal agencies to consult with NMFS on activities that may adversely affect Essential Fish Habitat (EFH). The objective of an EFH assessment is to determine whether the proposed action(s) “may adversely affect” designated EFH for relevant commercial or Federally managed fisheries species within the proposed action area. The assessment describes conservation measures proposed to avoid, minimize, or otherwise offset potential adverse effects to designated EFH resulting from the proposed action.

EFH includes those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity (16 U.S.C. 1801 et seq.). In order to qualify as freshwater EFH for Pacific salmon, four major components must exist:

- Spawning and incubation
- Juvenile rearing
- Juvenile migration corridors
- Adult migration corridors and adult holding habitat

Important features of EFH for spawning, rearing, and migration include adequate substrate composition, water quality (e.g. dissolved oxygen, nutrients, temperature, etc.), water quantity, depth and velocity, channel gradient and stability, food, cover and habitat (e.g. large woody debris, pools, channel complexity, aquatic vegetation), space, access and passage, and floodplain and habitat connectivity. EFH for Chinook and coho salmon occurs in the project area.

Effects of the proposed action on EFH would be essentially identical to those discussed in Sections 7.3 and 7.4, including temporary turbidity increases. Substrate composition would be largely unchanged from pre-flood conditions. Short-term adverse water quality changes may occur during construction due to increased turbidity. Water quantity, depth, velocity, channel gradient, stability, access, and passage would be unaffected or returned to pre-flood conditions after construction. Levees artificially

create channel stability and reduce floodplain connectivity. This levee repair would maintain diminished habitat function within the repair reach.

Consultation under the MSA was initiated in the BA transmitted to NMFS on 20 April 2018. In the BO received on 25 June 2018, NMFS outlined recommended EFH conservation measures. The EFH conservation recommendation outlined in the BO is to implement all of the RPMs and terms and conditions described in the Incidental Take Statement. The Corps responded to the NMFS in a letter on 18 July 2018 outlining the Corps' ability to fulfill the BO conditions. Appendix E provides this response.

11.1.8 National Environmental Policy Act

NEPA (42 U.S.C. 4321 et seq.) requires that Federal agencies consider the environmental effects of their actions. It requires that an EIS be included in every recommendation or report on proposals for legislation and other major Federal actions significantly affecting the quality of the human environment. The EIS must provide detailed information regarding the proposed action and alternatives, the environmental effects of the alternatives, appropriate mitigation measures, and any adverse environmental effects that cannot be avoided if the proposal is implemented. Agencies are required to demonstrate that decision makers have considered these factors prior to undertaking actions. Major Federal actions determined not to have a significant adverse effect on the quality of the human environment may be evaluated through an EA.

In accordance with NEPA, Federal projects are required to disclose potential environmental impacts and solicit public comment. A Notice of Preparation for repairs to Yakima Right Bank Site 5 was released on 29 September 2017. The Notice of Preparation was also sent to the Yakama Nation on this date via email and letter.

This Supplemental EA has been prepared pursuant to NEPA Sec. 102(C). Effects on the quality of the human environment as a result of the proposed repairs to Site 5 are anticipated to be less than significant. Likewise, the collective effects when added to those previously completed and discussed in the initial NEPA documents for repairs to the Yakima Right and Left Bank Levees, are anticipated to be less than significant. The Supplemental EA has incorporated any necessary and applicable modifications to the scope and/or nature of the project originally outlined in the initial EA and FONSI, any effects to the human environment resulting from these modifications, the procedures and practices used to implement the project, and/or the type and extent of compensatory mitigation associated with the project. Accompanying this Supplemental EA is an Amended FONSI.

11.1.9 National Historic Preservation Act

Section 106 of the National Historic Preservation Act (16 USC 470) requires Federal agencies to take into account the effects of proposed Federal undertakings on historic properties included or eligible for the National Register of Historic Places. The implementing regulations for Section 106 (36 C.F.R. § 800) require Federal agencies to consult with various parties, including the Advisory Council on Historic Preservation, SHPO, and Indian tribes to identify and evaluate historic properties, and to assess and resolve effects to historic properties.

The Corps initiated consultation with SHPO and the Confederated Bands and Tribes of the Yakama Nation on the proposed repairs. Based on field investigation and the results of review of Corps' archives and the Washington SHPO's online records, the Corps found that there would be no historic properties affected by a Repair In-Kind to Yakima Right Bank Site 5. Letters to document the APE and submit the Corps' finding of No Adverse Effect to Historic Properties for the Repair In-Kind Alternative were sent to the SHPO on 8 September 2017 and 15 November 2017, respectively. The SHPO agreed with the Corps' determination of the APE on 11 September 2017 and with the Corps' findings in a letter dated 15

November 2017. A letter requesting comment was sent to the Yakama Nation on 11 September 2017. The Yakama Nation did not comment on the undertaking. See Appendix F for record of consultation.

11.2 EXECUTIVE ORDERS

11.2.1 Executive Order 11990, Protection of Wetlands

Executive Order 11990 encourages Federal agencies to take actions to minimize the destruction, loss or degradation of wetlands, and to preserve and enhance the natural and beneficial values of wetlands when undertaking Federal activities and programs. No wetlands exist within the proposed construction area. The proposed action is consistent with this Order.

11.2.2 Executive Order 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low Income Populations

Executive Order 12898 requires Federal agencies to consider and address environmental justice by identifying and assessing whether agency actions may have disproportionately high and adverse human health or environmental effects on minority or low income populations. Disproportionately high and adverse effects are those effects that are predominately borne by minority and/or low income populations and are appreciably more severe or greater in magnitude than the effects on non-minority or non-low income populations.

The proposed action would not have a disproportionate adverse impact on low-income or minority populations since the preferred alternative would restore pre-existing levels of flood protection to the floodplain. Therefore, the proposed action complies with this Order.

11.2.3 Executive Order 11988, Floodplain Management

Executive Order 11988 requires Federal agencies to avoid, to the extent possible, the long and short-term adverse impacts associated with the occupancy of the floodplain, and to avoid direct and indirect support of floodplain development where there is a practicable alternative. In accomplishing this objective, “each agency shall provide leadership and shall take action to reduce the risk of flood loss, to minimize the impact of floods on human safety, health and welfare, and to restore and preserve the natural and beneficial values served by flood plains.”

Under Engineering Regulation 500-1-1(Chapter 5 Section 3 Paragraph 5-13.f), the provisions of Executive Order 11988 are normally not applicable to the repair of flood control works to the pre-disaster condition, as the repair actions do not directly affect either the modification or occupancy of floodplains, and do not directly or indirectly impact floodplain development. The proposed project does not constitute a major rehabilitation project, require extensive engineering and design, or significantly change the project footprint and therefore is not required to be evaluated for its impact on the floodplain.

12 CONCLUSION

Based on the above analysis in this supplemental EA and the analysis in the original EA and FONSI for repairs to the Yakima Authorized Right and Left Bank Levees, rehabilitation of the Yakima Right Bank Site 5 under the Repair In-Kind Alternative is not a major Federal action significantly affecting the quality of the human environment, when viewed in isolation or collectively in conjunction with the initial four levee repair efforts, and therefore does not require preparation of an EIS.

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14 LIST OF ACRONYMS

APE	Area of Potential Effect
BA	Biological Assessment
BMP	Best Management Practice
BO	Biological Opinion
CWA	Clean Water Act
CFR	Code of Federal Regulations
CEQ	Council on Environmental Quality
E	Endangered
EA	Environmental Assessment
Ecology	Washington Department of Ecology
EFH	Essential Fish Habitat
EIS	Environmental Impact Statement
EPA	Environmental Protection Agency
ESA	Endangered Species Act
ESU	Evolutionarily Significant Unit
FONSI	Finding of No Significant Impact
GHG	Greenhouse Gas
LOP	Level of Protection
MSA	Magnuson-Stevens Fishery Conservation and Management Act
NAAQS	National Ambient Air Quality Standards
NEPA	National Environmental Policy Act
NHPA	National Historic Preservation Act
NMFS	National Marine Fisheries Service
OHWM	Ordinary High Water Mark
RM	River Mile
RPM	Reasonable and Prudent Measure
SHPO	State Historic Preservation Officer
SIP	State Implementation Plans
T	Threatened
TDML	Total Maximum Daily Load
USFWS	U.S. Fish and Wildlife Service
WDFW	Washington Department of Fish and Wildlife
WQI	Water Quality Improvement

APPENDIX A – SITE PHOTOS



Photo 1. Photo taken from under the I-82 Bridge, looking upstream along the Naches.



Photo 2. Damage located under the bridge includes erosion along the toe and undermining of the trail so that it is falling into the river. Photo is taken looking upstream along the Naches River from under I-82.



Photo 3. Another view of the damage underneath the bridge showing material eroding into the river below the bridge.



Photo 4. Another view of the damage underneath the bridge, including armor and exposed gabion boxes and concrete bridge foundation.



Photo 5. On levee top looking down the path which snakes along the levee downstream towards the I-82 Bridge.



Photo 6. On top of levee looking downstream towards the I-82 Bridge. Upper slopes of riverward levee relatively free of vegetation for a majority of its length.



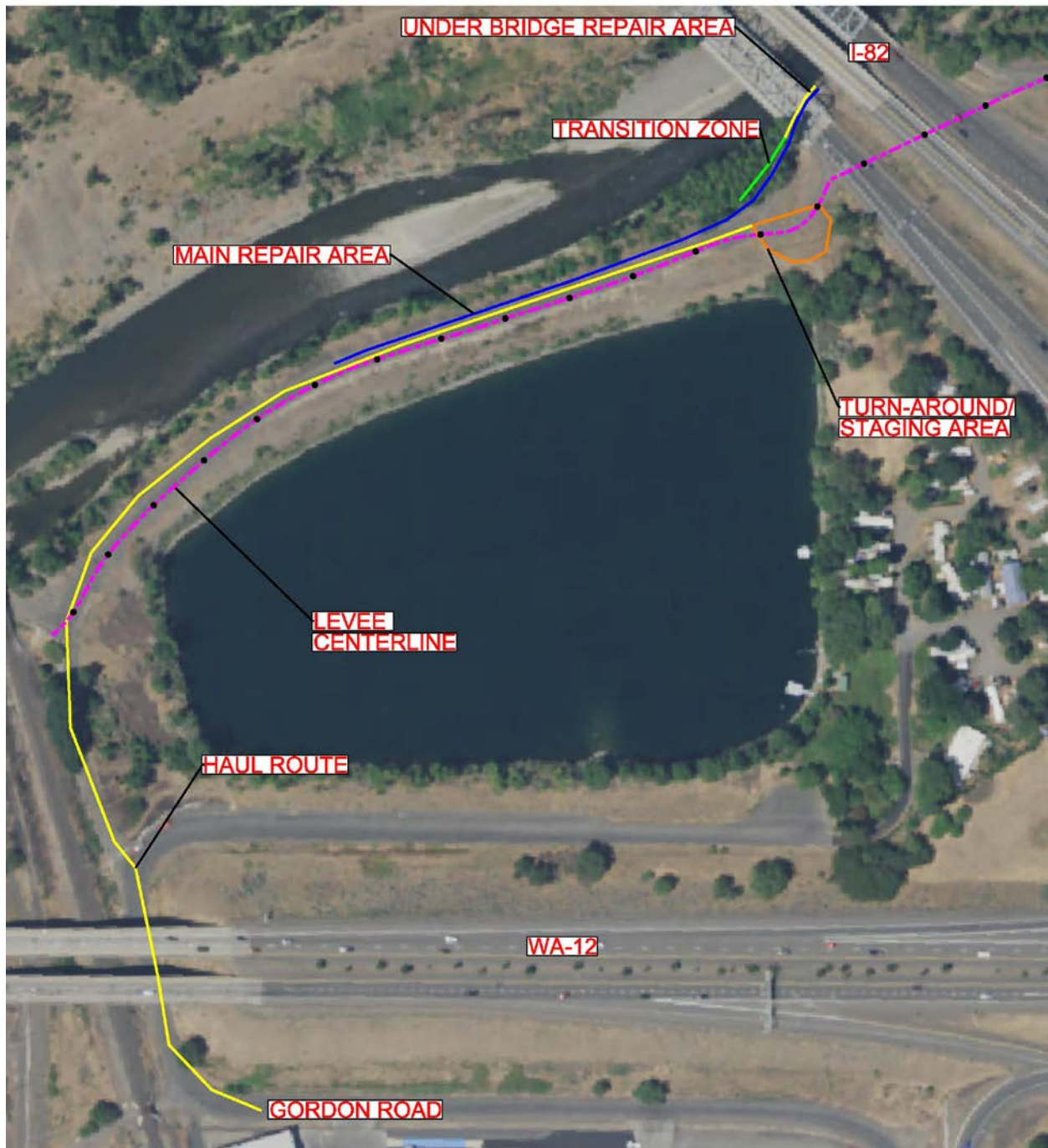
Photo 7. Photo taken below the I-82 Bridge looking upstream. Damages along levee riverward toe evident.



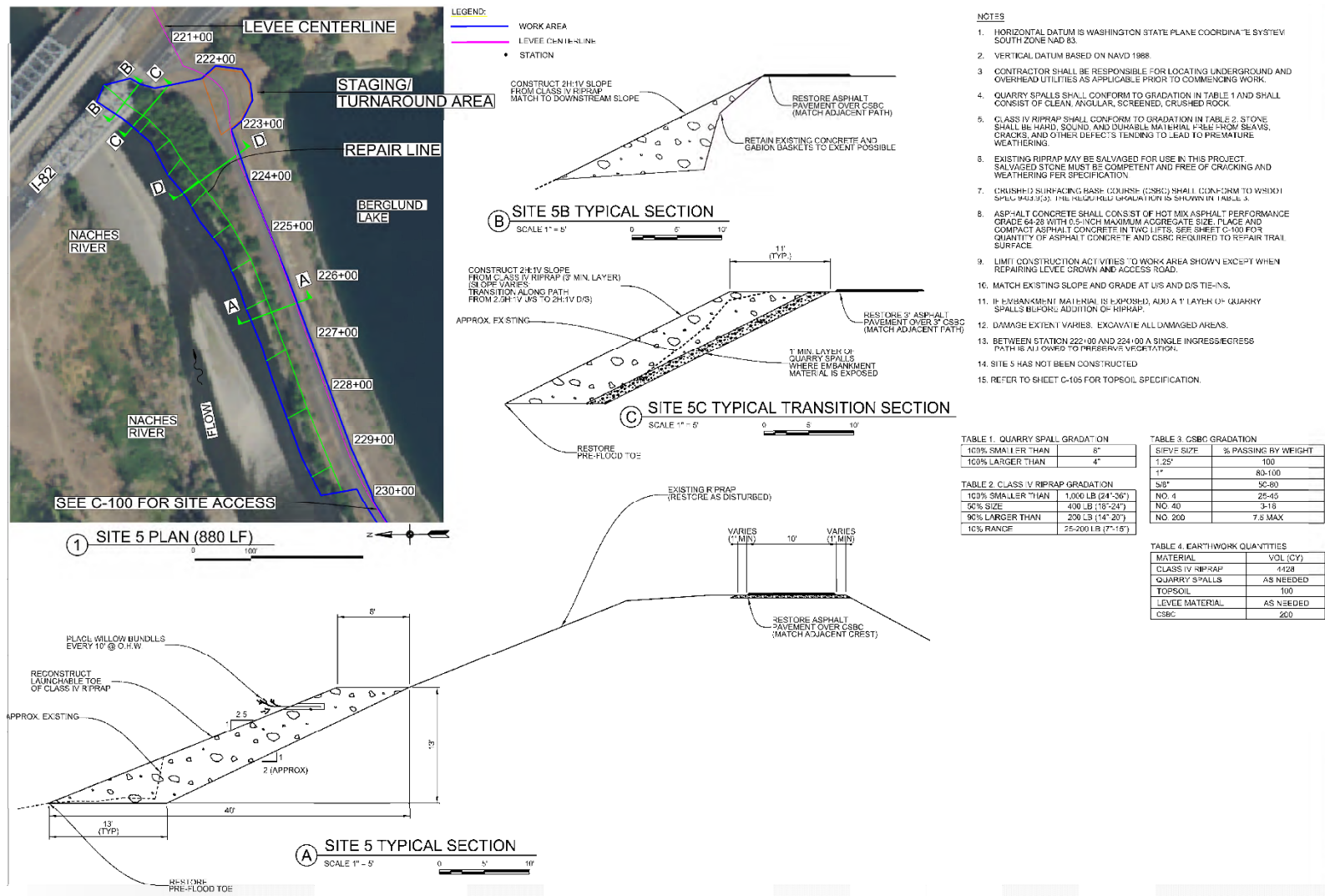
Photo 8. Close up on a section of the damage.

APPENDIX B – DESIGN DRAWINGS

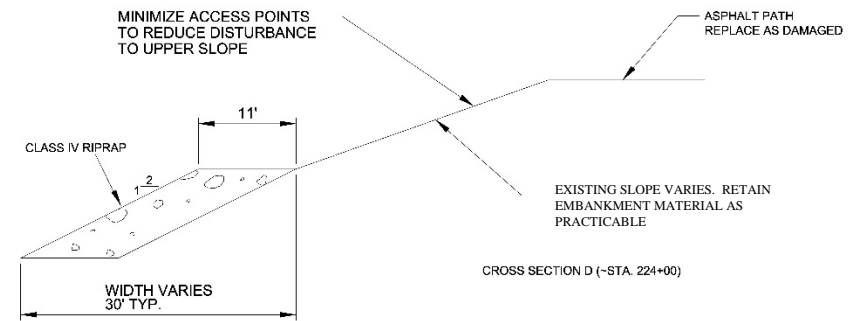
General Site Plan including damage and access.



Below is the plan and section for Right Bank Site 5 repairs. It is taken from the Yakima Right Bank Levee repair design plan packet.



This page contains details used in consultation with USFWS and NMFS. Cross Section D and this ingress path was created to show typical conditions at this part of the repair. Due to similarity in shape to Section A, it was not included in the final designs. However, it is included here to show the possible ingress to reduce vegetation impacts (See Note 13 above in the design plan).



Typical Section D cross section. Mid-slope bench width varies. Note this cross section is missing the willow bundles which are in the design plan packet drawing for Site 5 (previous page).

Approximate Upstream to Downstream Section Extents

Total Length: 229+80 to 221+00 (880 feet)
 Section A – 229+80 to 224+00 (580 feet)
 Section D – 224+00 to 222+00 (200 feet)
 Section C – 222+00 to 221+50 (50 feet)
 Section B – 221+50 to 221+00 (50 feet)

Possible single ingress-egress access to Section D, C, and B shown in red.

APPENDIX C – WATER QUALITY MONITORING PROTOCOLS

Monitoring will occur during in-water sediment-generating activities. Each new type of sediment-generating activity will be monitored. If monitoring shows that a particular type of activity is not causing exceedances for the state of Washington, then that type of activity will not be monitored unless conditions are notably different. For example, the in-water launchable toe construction will be monitored. If no exceedances occur, or if an exceedance is shown to be remedied by a modified construction method that can be repeated, then this sediment-generating activity will not be further monitored. However, in this example, sediment-generating activity may still need to be monitored if the river bottom and velocities are significantly different in areas.

Sediment-generating activities expected to occur during construction include, but are not limited to the following:

- In-water toe or bank excavation
- Rock placement for toe rock
- Rock placement for bank construction

Monitoring will consist of the following procedures:

- Sampling will be conducted using a Hach Turbidimeter, or equivalent, calibrated weekly at a minimum.
- Turbidity will be monitored 100 feet upstream (background level) and 300 feet downstream of the site (point of compliance, per WAC 173-201A-200), as safety permits, twice in the first hour of the work day and then once every 3 hours, if no exceedance is noted, until the end of the work day.
- Maximum turbidity levels will meet WAC 173-201A-210. Turbidity must not exceed 5 NTU over background when the background is 50 NTU or less; or a 10 percent increase in turbidity when the background turbidity is more than 50 NTU.
- If, after a minimum of one full day, the monitoring results verify that turbidity levels from a certain sediment-generating activity is remaining consistent with the above values, turbidity monitoring may be reduced or stopped for that activity. Monitoring would be resumed during new sediment-generating activities or if precipitation events or any other changes would result in higher or lower project-related turbidity.
- Visual monitoring for turbidity will continue throughout construction. Any noticeable plume will trigger re-commencement of physical monitoring to ensure compliance.
- If turbidity levels exceed the above values, activities will cease and actions will be taken to avoid or reduce turbidity levels. After an exceedance, the Corps will assess the site BMPs and update or improve BMPs to prevent recurrence. When construction recommences, downstream monitoring would occur every fifteen minutes, through construction until readings show three consecutive measurements below the thresholds. Then the Corps will continue monitoring as normal.

APPENDIX D – PUBLIC COMMENT



State of Washington
DEPARTMENT OF FISH AND WILDLIFE
South Central Region 3 – 1701 S. 24th Avenue, Yakima, WA 98902-5720
Telephone: (509) 575-2740 • Fax: (509) 575-2474

October 12, 2017

US Army Corps of Engineers
Seattle District
Attn: Environmental and Cultural
Resources Section
P.O. Box 3755
Seattle, WA 98124-3755
ATTN: Zachary Wilson

Dear Mr. Wilson:

**SUBJECT: NEPA, Notice of Preparation, PME-17-10, Environmental Assessment;
WDFW Comments on Additional Repairs to the Yakima Authorized Right Bank Levee,
Naches River, Yakima, Washington, WRIA 37.0001 & WRIA 38.001**

The Washington Department of Fish and Wildlife (WDFW) reviewed the above-referenced National Environmental Policy Act (NEPA) document dated September 29, 2017 and we offer the following comments and information. Other comments may be offered as the project progresses.

RETAIN MATURE RIPARIAN HABITAT

It will be preferable to avoid losses of well-established riparian corridors where levee protections can be safely reestablished streamward of the corridors. For instance, at Site 5 the Naches River can be shifted toward the left bank by a restored levee with minimal or no resource impacts. The existing vegetation and its root mass, which is growing within existing, remaining levee materials, are extremely resistant to scour. Planting benches and the restored levee toe, or perhaps bank barbs or groins; can be constructed next to and streamward of the existing protections with limited impacts to those existing protections.

INCORPORATION OF PLANTING BENCHES, WILLOW LIFTS, LWD

We support the bioengineering and mitigations specified in the Preferred Action. Yet, alternatives exist to removing established, functioning riparian vegetation where the channel alignment can be adjusted some toward an opposing bank. Bank barbs with anchored wood structures alternating between the rock fingers might also be more sensible implementations of the action at certain locations. Those might achieve more efficient uses of materials along with

greater safety afforded to boaters from the installed large wood pieces. These can also provide velocity refuges for fish and wildlife that are more scarce throughout the action reach.

REVEGETATION / MITIGATION

Lower-growing (15-20') shrubs such as willow or redosier dogwood may be better choices for levee vegetation versus taller cottonwood or willow. We understand that when larger vegetation topples, their weight can cause damage to the levee structure. Thus, both grass and shrubs can fulfill many of the riparian functions without presenting the same risks. Further, where taller-growing trees that are already on a levee must be removed, the full, intact stems should always be placed into the river to help offset potentially-lost habitat functions.

Thank you for the opportunity to provide these comments. If you have any questions, please contact me at (509) 457-9310.

Sincerely,



Eric L. Bartrand
Area Habitat Biologist

EB:eb

Ecc: Jody Walters, NMFS
Jeff Krupka, USFWS
David Lind, Yakama Nation
Terry Keenhan, Yakima County, Water Resources
Scott Schafer, City of Yakima, P.W.
Perry Harvester

Response: The Corps imposes rigorous safety considerations on levees, one aspect of which is restricting vegetation growth on levees within 15 feet of the levee toe (as determined by the elevation of the landward grade). Maintaining these safety measures is generally the responsibility of the local non-Federal Sponsor, but in conducting repairs under PL 84-99 the Corps adheres to its vegetation standards. The Corps integrates vegetation in light of impacts to endangered and threatened listed species, but must consider levee structural integrity, as well as accessibility and inspectability. For the proposed repair the Corps is integrating willow bundles into the repair. These willow bundles are to be monitored at the end of the first year of construction (fall 2019) and replanted as necessary. In the event that any replanting is necessary, the Corps would monitor these new plantings for one additional year. The willow bundles would be maintained by Yakima County to the minimal amount necessary to

retain adequate visual fields for inspection of the levee structure. Additionally, the Corps will retain existing slope vegetation as possible during repair activities. However, vegetation impacts are expected. Any large woody debris generated by the repair will be placed along the levee toe to continue providing habitat function. Offsite plantings are also being planted.

The addition of planting benches, bank barbs, groins, and anchored woody material does provide habitat benefits; however, it also greatly increases the complexity of the design and the size of the project footprint. These features typically require an increase in the volume of rock within the levee to protect against potential scour increase. The design also needs to consider expected flow velocities to ensure appropriate sizing. Placement of these features would likely require additional Clean Water Act certification consideration. Work waterward of the levee toe may also require real estate easement acquisition, depending on the site-specific details. In addition, the purchase of the anchor rocks, anchoring chain/bolts, and appropriate rootwad/bole materials can be quite expensive, as can the delivery, set up and installation of these features. These features can also be unsuitable in some high energy reaches due to extreme hydraulic forces that make it extremely difficult to design and sustain, especially with how hydrological changes may affect the bridge structure downstream. While these features can be of great habitat benefit, inclusion into a project requires added time for environmental permitting, design, and real estate that can jeopardize the Corps' ability to quickly repair the damage and restore flood protection. The Corps is not pursuing installation of planting benches, bank barbs, groins and anchored woody debris as it may increase the chances of future damage at the site, would increase the riverward extent of armoring, and would result in increase in cost that is not directly justified by a habitat impact that mandates mitigation.

APPENDIX E – REASONABLE AND PRUDENT MEASURES AND TERMS AND CONDITIONS



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

Planning, Environmental and Cultural Resources Branch
CENWS-PMP-E

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

CC:
Mr. Sean Gross
Columbia Basin Branch
National Marine Fisheries Service
304 S. Water St. #201
Ellensburg, WA 98926

RE: Consultation under Endangered Species Act Section 7 and the Magnuson-Stevens Fishery Conservation and Management Act for the Rehabilitation of Yakima Right Bank Levee Site 5, and Rehabilitation of Four Naches River Levees for WCR-2018-9273 and WCR-2018-9618

Dear Mr. Thom,

On 25 June 2018 the Seattle District, U.S. Army Corps of Engineers (Corps) received a Biological Opinion (BiOp) from the National Marine Fisheries Service (NMFS). The BiOp addresses Federally-listed species potentially affected by repairs to 5 levees in Yakima County, Washington: Rock Creek, Nile Road, Naches Segment 7, McCormick, and Yakima Right Bank (Site 5). This letter constitutes a response to the BiOp pursuant to the provisions of 50 C.F.R. § 402.14(i). Also, as required by Section 305(b)(4)(B) of the Magnuson-Stevens Act, a detailed response to NMFS is required after receiving the Essential Fish Habitat (EFH) conservation recommendations. The EFH conservation recommendation outlined in the BiOp is to implement all of the Reasonable and Prudent Measures (RPMs) and terms and conditions described in the Incidental Take Statement.

The Corps regrets that the emergency nature of this repair action and the associated Section 7 and EFH consultations, as emphasized in section 1 of the Biological Assessment (BA), precluded the opportunity for an exchange of comments on a Draft BiOp as contemplated by 50 C.F.R. § 402.14(g)(5) in which the action agency's perspective could have been more thoroughly discussed.

Terms and conditions outlined in the BiOp are listed below followed by the Corps response. The Corps has determined that it cannot fully implement two of the terms and conditions (b and d) outlined in the BiOp for RPM 2.

1. The following terms and conditions implement RPM 1:

- a. *Do not exceed an in-water construction footprint of 35,854 sq. ft.*

Response: The Corps will implement this RPM.

2. The following terms and conditions implement RPM 2:

- a. *Ensure that willows grow on the repaired sections of levee.*

Response: It is inferred that this generally-phrased measure is fully encompassed within the conditions specified in terms and conditions 2.b. through 2.g., and invokes no additional operative requirements. See responses below.

- b. *Install live willow poles and necessary soil substrate along all repaired sections of the following levees: 550 feet of Rock Creek, 125 feet of Nile Road, and 1,200 feet of McCormick Site 1.*

Response: The Corps will install willows and substrate along Rock Creek Site 2 (125 feet¹) but not Rock Creek Site 1 (375 feet). As described in the Corps' Biological Assessment, the river makes a sharp bend at Rock Creek Site 1 such that the full force of the Naches River hits the levee. The sharp bend in the river combined with the river velocity causes the water surface on the outside of the bend (along Site 1) to rise. The river width at this location is also constrained by a bedrock outcrop on the right bank and the levee on the left bank. As river flow increases, velocity through this narrow channel increases. Any topsoil placed would be eroded soon after installation due to the nature of the flow at this site. As is also described in sections 3.1.1 and 6.1.5 of the BA, no vegetation existed in this reach in the pre-flood-damage condition.

At Nile Road the likely location of the ordinary high water elevation near the top of the lower slope of the Class V riprap blanket precludes effective installation of willow bundles. Installing willow bundles at or near the top of the lower slope of Class V riprap would leave the soil pockets exposed and without erosion protection. High flows would erode the soil pockets rendering survival of willows in that location infeasible. As is also described in section 3.1.1 of the BA, no vegetation existed in this reach in the pre-flood-damage condition.

Installing willows at either the Rock Creek Site 1 or Nile Road segments would be technically infeasible from the perspective of plantings survivability and/or structural integrity of the repaired levee. As conducting these plantings would

¹The Corps' Biological Assessment estimated the repair length at Rock Creek Site 2 as 175 feet long and has since been shortened to 125 feet for a total length of 500 feet of repairs at Rock Creek. Site 1 length of 375 feet remains unchanged.

thus constitute an “alter[ation] of the basic design” of the action and would entail more than “only minor changes” pursuant to 50 C.F.R. § 402.14(i)(2), Term and Condition 2.b. is not both “necessary and appropriate.”

Willow bundles will be installed along the 1,200 feet of McCormick Site 1.

- c. *Install live willow poles and necessary soil substrate along 780 feet at the Yakima Right Bank Site 5 levee (referred to as Sections A and D of the levee in the Corps' draft plans).*

Response: The Corps will implement this term and condition.

- d. *Install willow poles according to the specifications of the NRCS publication: TN Plant Materials No. 21: Planting Willows and Cottonwood Poles under Rock Riprap (NRCS 2007), including but not limited to:*
- i. *Willow poles will be installed in bundles installed between 45 degrees and vertical along every 6 feet of repaired bank length.*
 - ii. *Willows poles must be installed to reach a minimum of 6 inches deep into the seasonal low water table and extend above the typical high water line and 6-12 inches above the riprap.*

Response: Construction of a properly graded riprap layer that will remain stable and functional is best achieved by placing compacted horizontal lifts from the bottom up. Installing willow poles oriented between vertical and 45 degrees cannot be accomplished without either creating weak spots in the erosion protection or destroying the willow poles as successive lifts of riprap are placed. Avoiding the latter risk by installing the willow poles after constructing the riprap layer is also impractical, cost-prohibitive, and would damage the stability and functionality of the completed riprap layer.

Installing willows at the angle and depth as indicated in the cited NRCS publication would be technically infeasible from the perspective of structural integrity of the completed engineered facility. As conducting the plantings in this manner would thus constitute an “alter[ation] of the basic design” of the action and would entail more than “only minor changes” pursuant to 50 C.F.R. § 402.14(i)(2), Term and Condition 2.d. is not both “necessary and appropriate.”

- e. *Soil must be installed such that at least the lowest 60 percent of the length of each pole is in contact with soil substrate that is stabilized by a filter layer.*

Response: Bundles will be installed so that 60 to 80% of each bundle is covered. The empty voids between riprap will be filled with embankment material and spall rock where plantings are placed. This will reduce soil loss from voids and gaps. Additionally, the soil used in plantings will be sorted through a ½” sieve so that small rocks may be retained for soil structure.

- f. *Ensure that willow poles survive the establishment period by watering as necessary. This will be most important for willows installed during summer and early fall.*

Response: The Corps will water plantings as necessary. Plantings will be watered throughout construction. Aside from Rock Creek, the remaining repair sites are to be repaired in autumn and winter when willows are dormant.

- g. *Ensure that willows are allowed to grow and provide habitat functions by coordinating with entities responsible for levee maintenance, including Yakima County and others as appropriate.*

Response:

The Corps will coordinate with the sponsor to ensure that the plantings survival standard is met. The Corps will inform the sponsor that these plantings are part of the repair as mitigation and should only be trimmed to the minimal amount necessary to retain adequate visual fields for inspection of the structure.

- h. *Ensure that at least 80 percent of bundles have at least one live pole surviving in October 2019. If less than 80 percent of the bundles have at least one live pole, replace the failed bundles and soil (as necessary), and monitor for an additional year.*

Response: The Corps will go back at the end of the first year of construction (fall 2019) to monitor the plantings and replant as necessary. In the event that any replanting is necessary, the Corps will monitor those new plantings for an additional year. The method of installing the replacements will be completed by one of the following methods: hand installation, mechanical installation, or deconstruction of the upper slope to facilitate the replacement of the willows.

3. The following terms and conditions implement RPM 3:

- a. *By December 31, 2019, the Corps shall report monitoring items to include, at a minimum, the following:*
- i. *Project identification*
 - 1. *Project name: Rehabilitation of Yakima Right Bank Levee Site 5 (WCR-2018-9273) and Rehabilitation of Four Naches River Levees (WCR-2018-9618).*
 - 2. *Corps contact person.*
 - ii. *Construction details*
 - 1. *Starting and ending dates for work completed for construction*
 - 2. *Total area (sq ft) of in-water construction footprint*
 - 3. *Total area (sq ft) of riparian area disturbance (i.e., water-ward face of the levee)*
 - 4. *Results of turbidity monitoring*
 - 5. *A description of any elements of the project that were constructed differently than depicted in the BA, associated addendums and communications, or this opinion.*

iii. *Willow bundle survival at the end of the 2019 growing season, and if necessary, remedial measures planned to replace failed bundles.*

Response: The Corps will complete the above described report and provide it to NMFS by December 31, 2019.

b. *If less than 80 percent of willow bundles have at least one live pole surviving by October, 2019, submit an additional monitoring report following one growing season after bundles are replaced.*

Response: If any replanting is conducted as a result of monitoring for achievement of the survival standard in the fall of 2019 at the end of the first year, the Corps will complete an additional monitoring report detailing willow bundle survival at the end of the 2020 growing season.

c. *If take is exceeded, contact NMFS promptly to determine a course of action.*

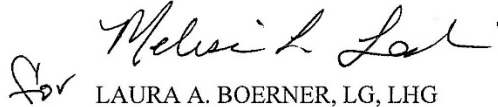
Response: The Corps will contact NMFS promptly if take is exceeded.

d. *All reports will be sent to National Marine Fisheries Service, Washington State Habitat Office, Attention Sean Gross, 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.*

Response: The Corps will send the report(s) to the above specified address.

Mr. Zachary Wilson is the Environmental Coordinator for this project and can be reached at (206) 316-3896 or zachary.m.wilson@usace.army.mil; and Mr. Fred Goetz, Endangered Species Coordinator, can be reached at (206) 764-3515 or Frederick.A.Goetz@usace.army.mil. I encourage you to contact them to discuss any questions or concerns you have.

Sincerely,

A handwritten signature in black ink, appearing to read "Laura A. Boerner". To the left of the signature is a small, stylized mark that looks like a checkmark or the letters "L" and "B" combined.

LAURA A. BOERNER, LG, LHG
Chief, Planning, Environmental and
Cultural Resources Branch

APPENDIX F – CULTURAL RESOURCE CONSULTATION LETTER



Allyson Brooks Ph.D., Director
State Historic Preservation Officer

September 11, 2017

Mr. Evan R. Lewis
Environmental Resources Section
Corps of Engineers – Seattle District
PO Box 3755
Seattle, Washington 98124-3755

Re: Yakima Authorized Right Bank Levee Repair Project
Log No.: 2017-09-06525-COE-S

Dear Mr. Lewis:

Thank you for contacting our department. We have reviewed the materials you provided for the Area of Potential Effect (APE) for the proposed Yakima Authorized Right Bank Levee Repair Project near Yakima, Yakima County, Washington

We concur with your determination of the Area of Potential Effect (APE) as described and presented in your figures and text.

We look forward to further consultations as consult you with the concerned tribal governments, provide the results of the professional cultural resources review, and your finalized determination of effect.

We would also appreciate receiving any correspondence or comments from concerned tribes or other parties that you receive as you consult under the requirements of 36CFR800.4(a)(4).

These comments are based on the information available at the time of this review and on behalf of the State Historic Preservation Officer in compliance with the Section 106 of the National Historic Preservation Act, as amended, and its implementing regulations 36CFR800.4. Should additional information become available, our assessment may be revised. Thank you for the opportunity to comment.

Sincerely,

Robert G. Whitlam, Ph.D.
State Archaeologist
(360) 890-2615
email: rob.whitlam@dahp.wa.gov

State of Washington • Department of Archaeology & Historic Preservation
P.O. Box 48343 • Olympia, Washington 98504-8343 • (360) 586-3065
www.dahp.wa.gov





Allyson Brooks Ph.D., Director
State Historic Preservation Officer

November 15, 2017

Mr. Evan Lewis
Environmental & Cultural Resources
Seattle District
Corps of Engineers
PO Box 3755
Seattle, Washington 98124

Re: Yakima Authorized Right Bank Levee Repair Project
Log No.: 2017-09-06525-COE-S

Dear Mr. Lewis:

Thank you for contacting our department. We have reviewed the materials you provided for the proposed Yakima Authorized Right Bank Levee Repair Project along the Naches River in Yakima County, Washington

We concur with your Determination of No Historic Properties Affected.

We would appreciate receiving any correspondence or comments from concerned tribes or other parties that you receive as you consult under the requirements of 36CFR800.4(a)(4).

In the event that archaeological or historic materials are discovered during project activities, work in the immediate vicinity must stop, the area secured, and the concerned tribe's cultural staff and cultural committee and this department notified.

These comments are based on the information available at the time of this review and on behalf of the State Historic Preservation Officer in compliance with the Section 106 of the National Historic Preservation Act, as amended, and its implementing regulations 36CFR800.4. Should additional information become available, our assessment may be revised, including information regarding historic properties that have not yet been identified. Thank you for the opportunity to comment and a copy of these comments should be included in subsequent environmental documents.

Sincerely,

Robert G. Whitlam, Ph.D.
State Archaeologist
(360) 890-2615
email: rob.whitlam@dahp.wa.gov

State of Washington • Department of Archaeology & Historic Preservation
P.O. Box 48343 • Olympia, Washington 98504-8343 • (360) 586-3065
www.dahp.wa.gov





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

The Honorable JoDe Goudy
Chairman
The Confederated Tribes and Bands of the Yakama Nation
P. O. Box 151
Toppenish, WA 98948

SUBJECT: Yakima Authorized Right Bank Levee Repair Project: Yakima County, WA

Dear Chairman Goudy:

The U.S. Army Corps of Engineers (Corps) proposes to conduct emergency levee repair along the Naches River as a change in project scope of a July 2017 Yakima River levee repair project following the discovery of an additional damage site. The site is located near Yakima, Washington (Figure 1). The purpose of the undertaking is to restore flood protection along an additional 830' of the Naches River. To assist in our review, we are notifying you about the project, requesting your assistance in identifying any issues or concerns you might have, and seeking information to identify properties which may be of religious or cultural significance that may be affected by the project as specified by the implementing regulations for Section 106 at 36 C.F.R. § 800.4(a)(4). The letter also summarizes efforts that the Corps has taken to date to identify historic properties that may be affected by the undertaking.

The proposed work involves replacement of the levee toe, riverward armor, and embankment material along 830' of levee.

The undertaking is located in Township 13 North, Range 18 East, Section 12 in Yakima County, Washington (Figures 2 and 3). The Corps has determined the area of potential effect (APE) for the Yakima Authorized Right Bank Levee Repair Project additional site repair to be the areas of construction disturbance, access, and staging. The Corps believes that the APE is sufficient to identify and consider both direct and indirect effects of the proposed project.

We would like to summarize efforts taken to date to identify cultural resources within the APE. The Corps staff archaeologist has completed a records and literature search in the Washington Information System for Architectural & Archaeological Records Data (WISAARD). While no sites exist within the APE, the area is considered very high risk for archaeological resources according to WISAARD's predictive model, and no previous surveys are known to have been conducted in the area. Moreover, a portion of the planned access falls within the buffer zone for a site within the Yakima Valley Transportation Company register district; the

bridge under which the repair is taking place is listed in WISAARD without a National Historic Preservation Act eligibility determination; and access skirts a cemetery buffer zone.

If the Tribe has information or concerns regarding properties which may be of religious or cultural significance that you believe may be affected by this project, please contact us as soon as possible so that we may consult with you and ensure consideration of the information in a timely manner. A copy of this letter with enclosures will be furnished to Kate Valdez, Tribal Historic Preservation Officer, Confederated Tribes and Bands of the Yakama Nation, P. O. Box 151, Toppenish, WA 98948.

If you have any questions or desire additional information, please contact the project archaeologist, Ms. Alaina Harmon, at alaina.harmon@usace.army.mil or (206) 764-3630. You may also contact Ms. Lori Morris (Tribal Liaison) at (206) 764-3625 or by email at frances.morris@usace.army.mil. I may be reached by telephone at (760) 764-6922 or by email at evan.r.lewis@usace.army.mil. Thank you for your assistance with this undertaking.

Sincerely,



Evan R. Lewis, Chief
Environmental and Cultural
Resources Branch

Enclosure

Figure 1. Vicinity Map

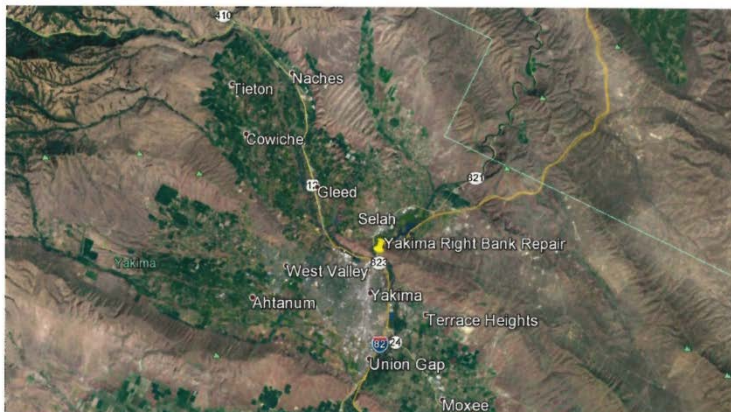


Figure 2. Project Location Overview



Figure 3. Project APE

