

Chapter 3 – Affected Environment, Impacts & Mitigation Measures

Roadway projects can potentially affect the natural environment (wetlands, vegetation, fish and wildlife, etc.), the built environment (residential areas, businesses and supporting infrastructure such as roads and services), and the social and economic conditions of an area. This chapter discusses those areas relevant to the Puyallup River crossing design revisions, the PRBR project, any changed conditions from the time of the 2006 FEIS, and the measures to be taken to mitigate adverse impacts.

3.1 How are environmental effects considered?

The following aspects of relevant potential environment effects are considered:

- **Direct temporary or short term** – These effects are typically related to a construction activity and go away when the construction activity stops.
- **Direct permanent or long term** – These effects are more lasting and are associated with the completed project. These effects are often called operational effects because they are associated with the opening and operation of the roadway.
- **Indirect** – Also known as secondary impacts, indirect effects are caused by the project and occur at a later time or some distance from the project.
- **Cumulative** – These are incremental impacts of the action when added to other past, present, and reasonably foreseeable future actions.

3.2 What are mitigation measures?

Using mitigation measures is a way for a project to lessen the effects and impacts of the Proposed Action. When impacts are unavoidable, we evaluate ways to compensate for these impacts. For example, compensating for unavoidable impacts such as wetland fill impacts or stream buffer clearing often means that a project will propose to enhance, restore, or create these important features somewhere else.

3.3 What types of environmental impacts are evaluated in this Draft Supplemental EIS?

This document supplements the 2006 FEIS by evaluating the environmental impacts associated with the PRBR as part of the 167 Extension project. The following resources were determined to be relevant to the changed conditions and revised design of the bridge replacement:

- Archaeological and Historic Resources (Section 106, and Section 4(f))
- Threatened and Endangered Species
- Water Resources
- Traffic

These aspects of the project are summarized in this document, and corresponding discipline reports or other supporting documentation is attached.

3.4 Archaeological and Historic Resources

Federal regulations, particularly Section 106 of the National Historic Preservation Act of 1966 and Section 4(f) of the Department of Transportation Act of 1966, require identification and evaluation of historic properties, including archaeological sites, within the Area of Potential Effect (APE) of proposed federally aided or sponsored projects. Projects must make every effort to avoid impacts to properties or sites that are listed, or are eligible for listing, on the National Register of Historic Places. A cultural resources survey and report is performed, which seeks to identify archaeological and historic resources within the project APE,

assesses any identified cultural or historic resources, and recommends measures for avoidance, or minimization of impacts to these resources. If impacts cannot be avoided, the report recommends mitigation measures.

3.4.1 How is the Area of Potential Effects different?

The APE defined for the 167 Extension project did not encompass the entire area that will be affected by the revised river crossing design of the PRBR project. WSDOT defined the APE for the 167 Extension project to include an area of direct effects within a 200 foot offset on either side of the proposed highway centerline, as well as any additional right of way required for interchanges, stormwater facilities and mitigation sites. The vertical extent of this area of potential direct effects was considered to be three feet. The APE also included an additional 200 foot offset, extending 400 feet from either side of the centerline, to account for potential indirect visual or audible effects.

WSDOT has revised the horizontal and vertical APE, for the supplemental survey, to include the revised bridge alignment to the west of the 1970 bridge. The APE encompasses all areas where ground disturbing activities associated with the proposed new bridge would occur, four feet deep in general, extending to 100 feet deep at the bridge abutment areas. The APE also includes the area within which the historic bridge and adjacent historic structures may be directly or indirectly affected by the project. **(See Exhibit 12)**

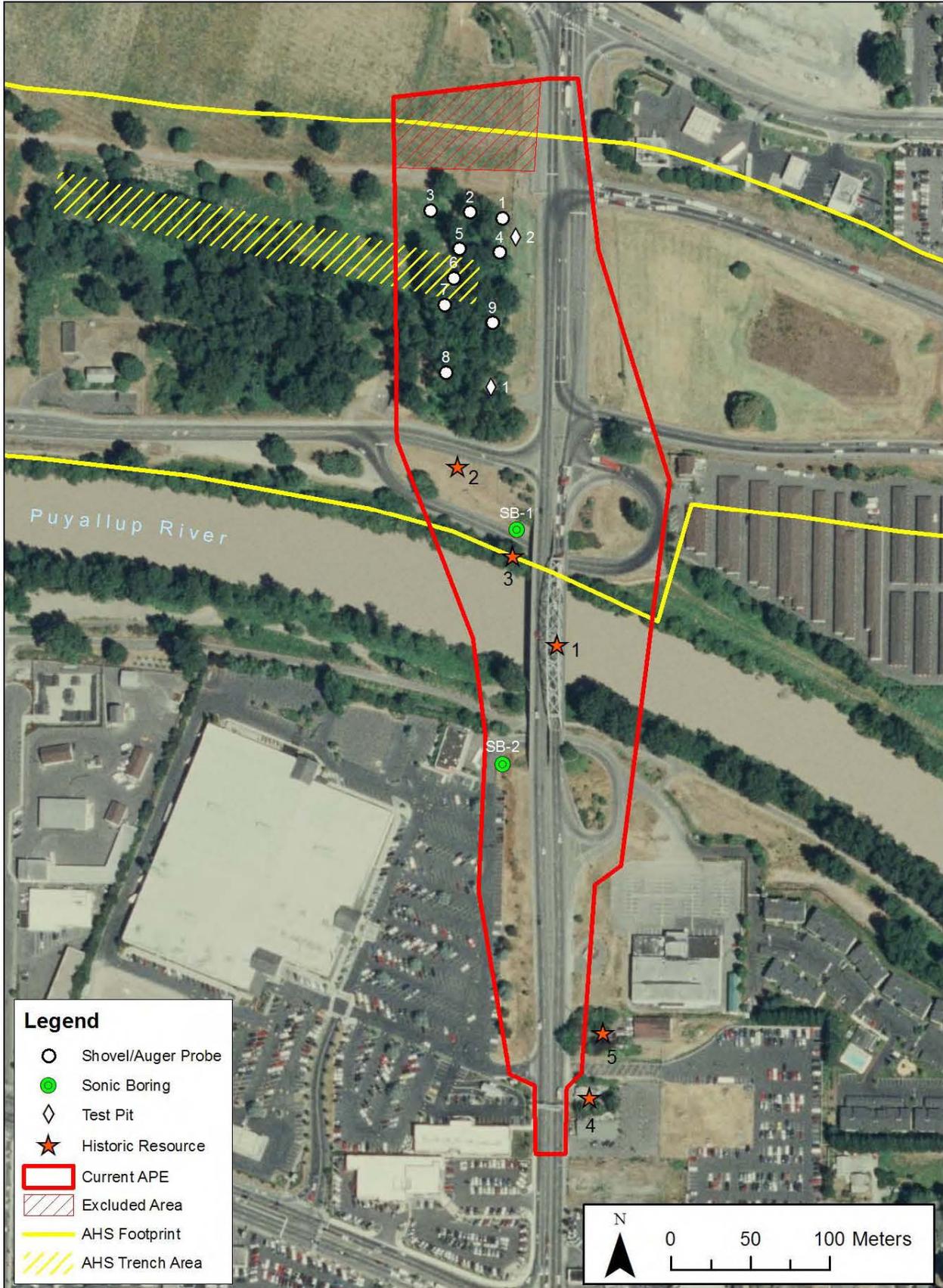


Exhibit 12 – Area of Potential Effects, (showing locations of previous survey work, and survey locations within the present study.)

Only the revised river crossing design study area, which encompasses the proposed PRBR project, was surveyed for the supplemental report. Any other areas of the 167 Extension project APE requiring Section 106 review or reevaluation will be addressed during future project phases.

3.4.2 What new studies and consultations have been undertaken?

Consultation with area tribes was reinitiated as soon as it was known that the APE may be revised. See Section 4.2 for more detail on consultation and coordination with tribes. A cultural resources survey was performed within the additional APE, and a report that supplements the previous cultural resources survey for the 167 Extension project, was completed in August 2012. The change in the current PRBR project is that the Meridian Street Bridge is eligible for listing on the NRHP, while it had not been determined eligible when the 2006 Final EIS was prepared. Therefore, the report includes the finding of an adverse effect to the historic bridge. The State Historic Preservation Officer (SHPO) concurred with WSDOT's determination of eligibility and affect call. Since historic resources are also Section 4(f) resources, an addendum to the Section 4(f) evaluation was completed. See Chapter 5 of this Draft Supplemental EIS for discussion of the Section 4(f) evaluation. See Appendix A for the cultural resources survey and Appendix B for the addendum to the Section 4(f) evaluation, for more detail.

3.4.3 What archaeological or historic resources have been identified in the APE?

No archaeological resources were identified within the extended area. Of the historic resources recorded within the APE, only the Meridian Street Bridge was determined to be eligible for listing on the NRHP. Reevaluation of the bridge for the supplemental survey yielded additional information on the unique nature of its design. The Meridian Street Bridge is currently the longest, simply supported, steel riveted Warren through truss span built prior to 1940 remaining on the Washington State highway system. The popularity of the Warren truss emerged in the late 1930s, and continued through the 1950s. Very few truss bridges were built on state-owned highways after 1960. Although a modest number of Warren trusses still remain on the system, the number has declined. Narrow bridges with restricted vertical clearance, such as through trusses, are routinely replaced by wider concrete bridges.

The Meridian Street Bridge is also significant for its unusual, perhaps unique truss configuration. As a variation from the standard Warren truss' horizontal top chord, the bridge has a parabolic top chord allowing for a longer span length than possible with the standard top chord. The parabolic configuration also avoided the need for heavier, or additional, truss components to reach the entire span length. Its subdivided panels and the addition of longitudinal members at the mid-panel heights in five truss panels achieved both strength and economy of steel. The bridge is significant for its design, which is the only one of its kind in Washington and may very well be unique in the United States if not the world, although additional research would be needed to confirm that conclusion. Despite modest alterations over the years, and additions made for safety and structural improvement, the bridge retains integrity of design, materials and workmanship, and is thus eligible for inclusion in the NRHP under Criterion C. The SHPO concurred with the WSDOT's determination of eligibility on February 8, 2012.

3.4.4 How will the Puyallup River crossing affect archaeological or historic resources?

The Puyallup River crossing would remove the existing NRHP eligible Meridian Street Bridge with either design. The funding for the PRBR project that would replace this bridge has been expedited because of the severe corrosion of the steel members and delamination of the concrete floor beams and piers. The structure is rated as *structurally deficient* based on the floor beam deterioration. The project will take the bridge out of service as part of SR 167, and remove the structure from its current location.

3.4.5 What measures will be taken to minimize effects to the Meridian Street Bridge?

WSDOT has undertaken a complete redesign of the Puyallup River crossing aspect of the 167 Extension project, in order to minimize the adverse effect to the Meridian Street Bridge. The original design required that the Meridian Street Bridge be removed as a first order of work, so that a new bridge could be constructed in its place. The revised design would construct a new bridge to the west side of the 1970 bridge, which allows the Meridian Street Bridge to remain in operation during construction of the new bridge. This also allows more time to achieve agreement on a mitigation plan, and to relocate the structure. WSDOT developed partnerships with the affected local jurisdictions and plans to reuse the Meridian Street Bridge steel truss structure in another location.

3.4.6 What measures will be taken to mitigate effects to the Meridian Street Bridge?

Because of its historic significance, WSDOT pursued ways to preserve the Meridian Street Bridge even though it will need to be removed from its present location. The local jurisdictions (King and Pierce Counties) are exploring the possibility of using the bridge on the Foothills Trail to connect Enumclaw and Buckley across the White River. If this plan does not work out, WSDOT is prepared to store the bridge and market its availability for preservation at an alternate site.

A Memorandum of Agreement (MOA) is being developed to stipulate the measures that will be taken to achieve this proposed mitigation. The MOA will also stipulate additional Section 106 review of future phases of the SR 167 Extension project in order to ensure that historic properties outside the Meridian Street Bridge, PRBR project area have been adequately taken into account. WSDOT and FHWA will continue consultation with interested parties in order to seek ways to minimize, or mitigate adverse effects to the Meridian Street Bridge that would result from the PRBR project.

3.4.7 Will there be an archaeological monitoring plan implemented during construction?

Any MOA developed for this project will include an archaeological monitoring plan as a stipulation. All stipulations of the MOA will be developed through consultation between FHWA, WSDOT, SHPO and other interested parties. The *Amended Memorandum of Agreement Between the Federal Highway Administration and the Washington State Historic Preservation Officer Pursuant to 36 CFR Part 800.6(a) Regarding the SR 167 Puyallup to SR 509 Project, Pierce County, Washington* signed in December 2009 states in part for Stipulation 4):

“At least 90 days prior to advertising the project for construction, an Inadvertent Discovery Plan will be developed which will include any monitoring deemed necessary,…”

This measure will be included in the amended MOA.

3.5 Threatened and Endangered Species Consultation

WSDOT prepares a biological assessment for each federally funded project, when there are listed species in the area, to evaluate the potential impacts to any threatened or endangered species and the critical habitats for those species. In consultation with the federal regulating agencies, NMFS and USFWS, the biologist develops conservation measures that will be incorporated into the project design or construction plan.

3.5.1 What has changed in the project area?

Since the 2006 Final EIS and associated Endangered Species Act (ESA) Consultation was reviewed, the following conditions have changed within the study area:

- Two additional fish species have been listed as threatened – Puget Sound steelhead and the southern distinct population segment of Pacific eulachon;
- Bull trout critical habitat has been designated within the project area; and,
- Bald eagle was de-listed.

The proposed Puyallup River crossing design revision does not change the general habitat involved, which includes the river and riparian zone. The original design and the new design all fall within a footprint less than 200 feet wide.

3.5.2 What new studies and consultation have been undertaken?

WSDOT consulted with NMFS and USFWS regarding the proposed design changes involved with the Puyallup River crossing, and the proposed PRBR project. An update to the biological assessment has been prepared and submitted to the Services for their review on 07/25/2012, which evaluates the potential impacts with the revised design and the changed conditions within the study area. The ESA Section 7 formal update to USFWS has completed the necessary consultation with the service at this time. FHWA and WSDOT reinitiated consultation with NMFS and are expecting a biological opinion in December 2012. (The biological assessment update letters are attached, in Appendix C.)

3.5.3 Are there any changes to how species might be affected during construction?

The revised design for the Puyallup River crossing does not change the determination on bull trout: *may affect, likely to adversely affect*. However, with the update that has been made to the extent of bull trout critical habitat in the Puyallup River, the determination of *may affect, likely to adversely affect* on bull trout critical habitat is an additional potential effect of the 167 Extension project in the Puyallup River crossing area. The revised design does not change the original determination of *adverse affect* on essential fish habitat. There are no other changes in affect with the revised design.

The revised design will reduce the magnitude of some of the effects (underwater noise, turbidity, shading) for the Puyallup River portion of the action area. Although the specific construction methods will not be known until final plans are available from the contractor, it is anticipated that the number of piles for temporary structures in the Puyallup River may be reduced by 1/3 to 1/2 from the original estimate of 300 piles. This will lead to reduced sound exposure levels for listed and Chinook Salmon, fewer days with in-water pile driving and less associated turbidity, less shaded area in the river, a smaller area of impact to benthic prey organisms and a reduced in-river area for temporary structures that may affect salmonid migration.

The currently proposed PRBR project will only construct a portion of the ultimate Puyallup River crossing. When a future project is funded to remove the 1970 bridge and construct a new five-lane northbound bridge, the study area conditions and project effects will be reassessed and updated.

3.5.4 What conservation measures will be included in the project?

The construction of the PRBR project and future construction associated with the revised Puyallup River crossing would implement WSDOT standard construction practices to avoid impacts to water quality and thereby impacts to aquatic life and habitat. Additional design work on stormwater best management practices (BMPs) is in progress and staff will be conducting a stormwater analysis as plans develop. Preliminary plans show placement of a bioinfiltration swale within the northwest bridge quadrant; a feature of the revised design for this phase of work. The two bridge outfalls will also be relocated, with on additional outfalls being constructed. Final plans will be developed by the design-build contractor and will meet or exceed the design standards specified in the biological opinions, including the use of enhanced BMPs for this area. To limit in-water noise levels, piling is required to be installed to the degree possible using a vibratory hammer and impact driving/proofing will require noise reduction measures. In-water work will be timed to avoid adult salmon, bull trout and steelhead migration. Full containment will be required during demolition work to prevent debris from falling into the river. Additionally, the project will follow the provisions of all applicable permits and approvals (See Section 1.8).

3.6 Water Resources

3.6.1 What is similar between the 2006 FEIS and the proposed design in terms of water resources?

There would be no difference in the amount of impervious surface with the completed project. The revised design would not differ in impacts to ground water or surface water. Within the very limited extent of river and shoreline involved in this study area, there is no difference in permanent impacts or mitigation of the completed Puyallup River crossing portion of the 167 Extension project with either alignment of the structures. Both designs would remove the Meridian Street Bridge, and ultimately construct a new five-lane northbound bridge structure.

The 2006 FEIS presented only a preliminary design for the new bridge structure, but estimated a maximum of four permanent piers located within the ordinary high water mark of the river (2006 FEIS p. 2-23). With in-water work restricted to a six week window (July 15 – August 31), in-water work is expected to span two construction seasons. These aspects of the Puyallup River crossing are not expected to be different, since no further design of the five-lane northbound structure has been developed.

3.6.2 What are the differences between the 2006 FEIS and the proposed design in terms of water resources?

To construct the bridge replacement as proposed in the 2006 FEIS, two temporary trestles and one temporary detour bridge would be necessary. It was originally expected that one of the temporary work trestles would need to extend the full width of the river. Each temporary structure would involve installation and removal of multiple piles.

However, in the proposed PRBR design revision the work would shift the Puyallup River crossing to the west approximately 100 feet, downstream. The proposed project greatly reduces the need for a temporary work trestle by using the 1970 bridge to stage materials and equipment. The proposed project will require the construction of an in-water work trestle approximately 30' by 100', as opposed to a 30' wide trestle the full 300' width of the river, as proposed in the 2006 FEIS. This in-water work trestle will extend from the ordinary high water mark on the river bank, into the Puyallup River and will be used to construct the in-water bridge pier.

3.6.3 How will water resources be affected during construction of the Puyallup River Bridge Replacement project?

The proposed PRBR project would construct a new two-lane bridge to the west of the 1970 bridge. The preliminary design for the proposed new two-lane southbound bridge has one permanent in-water piers. This design will allow for material and equipment to be staged off of the 1970 bridge, reducing the need for a work trestle to access the in-water piers to a 30' by 100' work platform. No temporary detour structure will be required since the new structure would be built off line, while both north and south-bound traffic is temporarily diverted to the Meridian Street Bridge during construction. This minimizes impacts to the river and shoreline.

Best management practices, permit conditions, and other measures to avoid or minimize impacts to the water during construction will be the same as they would be with the previous bridge replacement design.

3.7 Traffic

The traffic study to predict the baseline traffic and growth rate for the 2006 FEIS was reported in the 2008 Traffic Analysis Report by Perteet, Inc. This analysis used 2005 traffic volumes for the baseline, and projected volumes to year 2030. In May 2012, WSDOT updated this analysis using 2011 traffic data as a baseline, and projected volumes to year 2035, to determine the need for additional analysis. The finding was that the traffic modeling results in the 2008 analyses are higher than the updated results. Therefore, it was

determined that the revised design for the Puyallup River crossing would not negatively affect traffic. The technical memorandum is attached in Appendix A.

3.7.1 What is similar between the 2006 FEIS and the proposed design in terms of traffic?

The ultimate Puyallup River crossing configuration, as part of the 167 Extension project, would require two southbound lanes and five northbound lanes. The northbound lanes would include two left-turn, one through, and two right-turn lanes connecting to the proposed SR 167/SR 161 interchange, located just north of the river crossing bridge. The Meridian Street Bridge is currently rated structurally deficient. With either design, the Meridian Street Bridge would be taken out of service for vehicular traffic, and removed from its location.

With either Puyallup River crossing design, the new replacement bridge will provide at least standard sidewalks and meet Americans with Disabilities Act requirements. With either Puyallup River crossing design, the proposed project will maintain all connections with local roads and will be compatible with the proposed new interchange.

3.7.2 How will the currently proposed PRBR project affect traffic during construction?

During construction, there will be short term closures or lane restrictions on some local roads and access points. These restrictions will be very limited due to the proposed bridge design that constructs the new bridge to the west of the 1970 bridge, while the existing bridges remain open to traffic. Bicycle and pedestrian traffic will be maintained throughout construction.

The likely material haul routes will be SR 167 and SR 410 to access local material sites, and Valley Avenue to access pre-cast facilities at the Port of Tacoma. WSDOT is not anticipating the need to use local roads for the operation of construction equipment and hauling trucks.

3.8 Indirect and Cumulative Effects

The 2006 FEIS discussed indirect and cumulative impacts with regard to each resource in Chapter 3. The cumulative impacts on critical resources were discussed in Chapter 3.17. The proposed revised design of the Puyallup River crossing as part of the 167 Extension project will not change the indirect and cumulative effects of the 167 Extension project.