

INSTREAM PROJECT DESIGN CHECKLIST

*For Design and Construction of Flood and Erosion Protection
Facilities and Habitat Restoration Projects that May Include
Large Wood Placement or Natural Wood Recruitment*

Project Name: Stossel Bridge Right Bank 2018 Repair Project Manager: Stella Torres

River/River Mile/Bank: Snoqualmie River / RM 21 Right Bank Date August 9, 2018

Check one or both:

- Project includes placement of large wood elements
- Project may influence the recruitment, mobility and accumulation of natural large wood.

Note: If the project is comprised of emergency work, then fill out and file this form within 30 days of completion of emergency work.

I. Project Background and Preliminary Design (30-40 Percent) Information

(Provide general information at a conceptual level)

1. Describe the overall river management context, strategy and objectives for the river reach. Refer to pertinent plans, policies or documents pertaining to flood hazards, salmon recovery, etc.

River management approaches in this river reach are informed by several plans and related documents that provide context for flood hazard management, salmon recovery, and agriculture.

- This project site was identified in and is consistent with the primary objectives of the adopted 2006 King County Flood Hazard Management Plan.
- The Snohomish River Basin Salmon Conservation Plan (2005) provides a snapshot of this mainstem reach on pages 11-29 and 11-43. The recovery focus is to restore watershed process by restoring forest and increasing floodplain connectivity and channel complexity.
- This site is also located in the Snoqualmie Agriculture Production District, and numerous County policies in the Comprehensive Plan and elsewhere support efforts to sustain viable agriculture in this portion of the Snoqualmie River valley.

2. Describe the goals and objectives of the project and its relative importance to the success of DNRP program goals and mandates. Identify funding source(s) and describe any applicable requirements or constraints.

The Stossel Bridge Right Bank Revetment is an existing King County Flood Control District (FCD) maintained facility that protects from flood damage: 310th Ave NE (King County), residences and an active farm. If unrepaired:

- The facility will likely fail during the upcoming flood season (2018-19) due to a section of the levee prism that has been completely eroded exposing gravel and sand substrate.
- Significant damage and financial loss will occur to public property (levee and a sole access county road) and utilities.
- Economic hardship will likely result for the private landowners of residences and farm protected by the levee.

Additionally, the repair will prevent in the short-term, more extensive damage to the weakened facility, while a future, more comprehensive project can be considered.

King County will design a repair for the revetment to be constructed by the onset of the flood season in 2018. Vertical piles are included in the design. The piles will be installed in the channel and used to anchor large wood elements at the toe of the revetment.

The objectives of the project include:

- Identify and evaluate alternatives to implement a near-term repair that can be designed, permitted and constructed by the end of September 2018).
- Construct a repair that is sufficient to protect the facility until a long-term project can be implemented (2-5 years). Provide aquatic and riparian habitat benefits.
- Conduct stakeholder coordination and work with residents throughout the project cycle.

3. Describe the existing (and historic, if relevant) site and reach conditions, including structural features, channel form, and the presence of naturally-deposited large wood. Describe known utilization by salmonids and any important or unique biological or ecological attributes.

The Snoqualmie River in the vicinity of the project reach is low gradient and meandering, and predominately confined to a single threaded channel. Sand bars are present on the inside bank of the river meanders and gravel bars are occasionally present where the river is not confined by bank protection and has widened. Naturally deposited large wood is common in the main channel. A moderate amount of large wood has naturally deposited along the bank at the project site.

King County commissioned Collins and Sheikh to map historical conditions in the Snoqualmie River valley (2002). This report indicates that large conifers including red cedar and Sitka spruce were present in the riparian corridor.

Salmon habitat in the Lower Snoqualmie River is degraded compared with historical conditions as a result of land use changes, floodplain development, and river management activities such as channel confinement by levees and revetments. These actions have contributed to the lack of in-stream geomorphic complexity and floodplain reconnection needed to create aquatic habitats that support healthy fish populations, including ESA-listed species such as Chinook salmon, steelhead, and bull trout. Shoreline and riparian areas, including the project site, lack mature trees, resulting in minimal shade and elevated water temperatures.

4. Describe what is known about adjacent land uses and the type, frequency, and seasonality of recreational uses in the project area. Are there nearby trail corridors, schools or parks? What is the source(s) of your information?

Land use in the vicinity of the project is primarily agricultural use. The adjacent properties are in private ownership. The Chinook Bend Natural Area is located across the river from the project site in the City of Carnation, on NE Carnation Farm Road. This 59-acre property lies within the Snoqualmie River's 100-year floodplain and is surrounded by river on three sides. The site contains rich habitat for many fish and wildlife species in its former pastureland, wetlands, and mature deciduous forest. The primary recreational uses of this site include walking, fishing, and nature observation.

Camp Gilead, a summer recreation camp is also located within the project vicinity on NE Carnation Farm Road in Carnation, WA. In water summer camp activities include inner tubing down the river.

The nearest parks are near Fall City, approximately 3 miles to the southeast. The Snoqualmie Valley Trail is east of State Route 203.

The Snoqualmie River is used for several types of recreational activities in the project site vicinity including jet skiing, fishing, casual floating, stand up paddle boarding, canoeing, and kayaking. However, recreational use in the Snoqualmie River in the project reach (between river miles 21.8-22.4 has been classified as generally infrequent (Synthesis of 2013 River Recreation Studies, King County River Recreation Study, prepared by Herrera Environmental Consultants for King County, 2014). Based on the 2013 Study aerial survey reach, most of the people observed using the Lower Main Stem Snoqualmie River (from Carnation to King County line) were adults and about 1/8 of the total were teenagers, ages 12 – 17 yrs. Of these recreational users, almost all were without life jackets. The recreational vessels used were mostly tubes, then the “other” category, and then rafts. Of these recreational vessels, less than 10% of them had paddles for control.

5. **If the project includes wood placement, describe the conceptual design of large wood elements of the project, including, if known at this stage in the design, the amount, size, location, orientation, elevation, anchoring techniques, and type of interaction with the river and stream at a range of flows.**

The project design does not have any large wood placement incorporated into the face of the revetment. There will be 12-15 ballasted wood elements (vertical piles with attached root wads) installed in-water at the toe of the revetment to stabilize the slope prior to the upcoming flood season in a manner that will minimize impacts to ESA listed species in the Snoqualmie River and provide protection by reducing velocities and curtailing accelerated bank erosion.

There is an accumulation of naturally occurring large wood along the bank of the project site. This wood will be removed for construction if needed and, following construction, will be replaced (un-secured) on the revetment near the ordinary high water (OHW) elevation for habitat, as per requirements in the Hydraulic Project Approval (HPA) permit.

6. **If the project includes wood placement, what is the intended structural, ecological or hydraulic function of the placed wood? What role does the placed wood have in meeting the project's goals and objectives? Is the project intended to recruit or trap additional large wood that may be floating in the river?**

The large wood structures will stabilize the toe of the revetment prior to the upcoming flood season in a manner that will minimize impacts to ESA listed species in the Snoqualmie River and provide protection by reducing local velocities, encouraging localized sediment deposition, and curtailing accelerated bank erosion. The wood structures are not intended to trap or recruit additional large wood that may be floating in the river, however, wood from upstream source may temporarily deposited within the project area.

7. **Is the project likely to affect the recruitment, mobility or accumulation of natural large wood, e.g., by encouraging wood deposition on or near the site or promoting bank erosion that may cause tree toppling? Describe expected site evolution and its potential effects on natural wood dynamics.**

Current patterns of wood mobility or accumulation are not likely to change as a result of the project. Wood from upstream sources may accumulate periodically at the site as it does under existing conditions. It is anticipated that naturally occurring large wood will be transported downstream in the case it is temporarily deposited within the project area.

8. **Describe how public safety considerations have been incorporated into the preliminary project design. For placed wood, address each of the considerations:**

- a. *Type, frequency, and seasonality of recreational use;*

The Snoqualmie River is used for several types of recreational activities in the project site vicinity including swimming, wading, canoeing and inner tubing down the river. However, recreational use in the Snoqualmie River in the project reach has been classified as generally infrequent (Synthesis of 2013 River Recreation Studies, King County River Recreation Study, prepared by Herrera Environmental Consultants for King County, 2014). Based on the 2013 Study aerial survey reach, most of the people observed using the Lower Main Stem Snoqualmie River (from Carnation to King County line) were adults and about 1/8 of the total were teenagers, ages 12 – 17 yrs. Of these recreational users, almost all were without life jackets. The recreational vessels used were mostly tubes, then the “other” category, and then rafts. Of these recreational vessels, less than 10% of them had paddles for control.

The root wads on the ballasted root structures will be oriented both upstream and downstream however the rootwads will primarily be below the low flow water level. The design will include a “bumper log” element placed at the upstream end of the wood elements being considered in the preliminary design. Additional bumper logs are being considered at individual wood element locations.

- b. *Wood location, positioning, and anchoring techniques:*

There will be 12-15 ballasted wood elements (vertical piles with attached large rock and root wads) placed in-water at the toe of the revetment.

- c. *Maximizing achievement of project goals and objectives while minimizing potential public safety risks*

The primary project goal is to create a stable bank with rock armor below OHHM and coir lifts planted with willow above. Additionally, a series of ballasted wood structures will be placed at the toe of the revetment. This will stabilize the slope prior to the upcoming flood season in a manner that will minimize impacts to ESA listed species in the Snoqualmie River and provide protection by reducing local velocities, encouraging localized sediment deposition, and curtailing accelerated bank erosion.

d. *Use of established and recognized engineering, geological, and ecological expertise:*

Professional engineers and ecologists have been involved in design and review of the project. The methods used to design this project are consistent with best professional practices.

9. Has the project been reviewed and approved by a Licensed Professional Civil Engineer? Please list other licensed technical staff who have reviewed and provided input on the design (e.g., Licensed Geologist and Licensed Engineering Geologist). Specify the Engineer of Record for the design and any other Licensed Professionals who have sealed their portion of the design plans. Were all reviews and approvals completed?

Professional Civil Engineers that are integral to project design include King County Project Engineer Mark Beggs and King County Engineer Mark Ruebel. The Engineer of Record is Mark Ruebel, King County.

10. Has the project been reviewed and approved by a King County Professional Ecologist (e.g., person with an advanced degree in aquatic and/or biological sciences from an accredited university or equivalent level of experience) if ecological benefits are an intended project objective, to evaluate the consistency of the design with project goals, existing environmental policies and regulations, and expected or known permit conditions? Specify the Reviewing Ecologist for the project. Was this review and approval completed? What is the anticipated schedule for completing project milestones (30-40% design, final design, major construction/earthmoving) and for soliciting public input)?

Yes, Tom Bloxton, Ecologist on the Capital Strike team within the River and Floodplain Management Section is on the project team and has reviewed and approved the 30% design.

Project Manager _____ Date _____

Supervising Engineer, Project Supervisor or Unit Manager _____ Date _____