

# 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: Teufel PL84-99 Mitigation (large wood component) Project Manager: Jennifer Rice

River/River Mile/Bank: Green River / RM 20.35 Left Bank Date 9-29-16

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.

The Teufel Nursery property is located on the left bank of the Lower Green River, between River Mile (RM) 20 and 20.8. It has no levees. This site was identified as a proposed project location in both the King County Flood Hazard Management Plan (2006) and the Green/Duwamish and Central Puget Sound Watershed Salmon Habitat Plan (WRIA 9) (2005). The project area is referred to as the Rosso Nursery in both plans. The King County Flood Control District purchased the Teufel site in 2011 after it was determined to provide ample room (over 36 acres) for current mitigation needs as well as for future flood risk reduction and salmon habitat restoration work.

In 2008 and 2009, King County on behalf of the King County Flood Control District removed 461 trees from levees along the Lower Green River. The objective of removing the trees from the levees was to meet Army Corps of Engineers Levee Rehabilitation and Inspection Program vegetation management compliance standards that were in place at the time. State environmental permits were required to allow the tree removal work, and one of the permit conditions was to mitigate for the tree removal by planting four trees for every tree removed and installing one piece of large wood for every tree that was removed from the riverward face of a levee. 1,844 planted trees and 146 pieces of placed wood were ultimately required for mitigation. Several small mitigation sites were identified, but a need remained for a large site to plant the remaining 1,046 trees and place 85 pieces of large wood. The Teufel site was chosen because it has no levees, and since much of the lower river is leveed, there are very few available sites where a large wood project and mitigation plantings would not conflict with Corps standards.

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.

Tree cutting on levees along the Green River in 2008 and 2009 to remain in compliance with US Army Corps of Engineers levee vegetation policies, required an Hydraulic Project Approval (HPA) permit from the Washington Department of Fish and Wildlife (WDFW). The HPA required mitigation for the loss of riverside trees. The proposed Teufel project will fulfill the remaining HPA mitigation requirements by planting 1,046 trees within 150 feet of ordinary high water along the Green River to mitigate for trees cut on the PL-84-99 levees (a 4-1 ratio), and by placing 85 logs in in the river to mitigate for trees cut on the riverward side of the PL84-99 levees (a 1-1 ratio). The King County Flood Control District is funding this mitigation project.

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?

The regional Green River Trail is located across the river from the project area. While not a formal trail, Frager Road, along the landward (west) side of the Teufel property is used often by cyclists, runners and walkers. The Riverbend Golf Complex is located across the Green River to the south of the project area between River Miles 20.4 and 21.8.

In-river recreational use of the Lower Green River is low based on the King County Synthesis of 2013 River Recreation Studies (p. 32). The full report is available at <http://www.kingcounty.gov/depts/dnrrp/wlr/sections-programs/river-floodplain-section/documents/2013-recreation-study.aspx>. Although recreational use of the Green River along the project reach was not observed directly in this report, the studied reach between Russell Woods Park (RM 19.4) and Briscoe Park (RM 15.9) is less than one mile downstream of the Teufel property and, since there are no known put-in or take-out points between the two locations, observations in this reach are expected to be similar to recreational use in the project area. The King County study found that the Lower Green River reach had much lower numbers of people per day than areas up-river, the highest life vest usage, and the highest use of boats with paddles (canoes and kayaks) rather than rafts and inner tubes. For example, remote cameras placed between Russell Woods Park and Briscoe Park recorded a total of 167 uses of the project reach in 2013 (0.5 people per day), 94% of people observed were adults, 70.7% of the people were observed with life vests, and 85% of the vessels counted were canoes or kayaks with paddles.

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 in-stream wood structure will consist of 85 pieces of wood that are at least 25 feet long and 24 inches basal diameter, with attached rootwads. The structure will be located along approximately 280 feet of an inside bend at the Teufel property, will vary in height between three and five log layers, and will be secured with piles and chains. The log structure will stand about eight vertical feet from the river bed at its highest point, and provide habitat over the range of flows between 2,800 cfs (cubic feet per second) and 400 cfs, to provide important slow water habitat for juvenile salmon during the key January- June rearing and outmigration period for Chinook salmon. River recreational safety has been optimized by placing deflector logs at the upstream end of the wood structure, and by designing the structure so that less than one foot of it will be in the water during low summer flows (July-September) when the river is likely to receive recreational use.

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 purpose of the placed wood is to create and enhance rearing and refuge habitat for juvenile salmon over a wide range of flows, and provide immediate shade and thermal refuge for fish. The project is not designed to intentionally trap additional wood floating in the river, but it may do so.

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.

There is very little natural large wood in this reach of the Green River so the project is not anticipated to have much effect on wood recruitment or mobility. The 1,043 trees that will be planted in the riparian corridor (within 150 feet of the river) to restore riparian functions are expected to contribute to natural recruitment to the river in the long-term: 20+ years after project construction. Planted trees are not expected to contribute to any wood that might rack-up on the installed wood structure because the tree planting mitigation area is downstream of the large wood installation site.

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*; As stated above, use of this reach of the river is low based on King County's Synthesis of 2013 River Recreation Studies (0.5 people per day). Compared to the other two reaches of the

**II. Pre-Construction Information** (70% or 100% design with permits) *These questions relate to the designed and permitted project. Information should include input resulting from permit review process, SEPA, boater safety meetings and any other stakeholders.*

11. Have any answers provided in Section I at the Preliminary Design Phase changed in the interim? If so, provide the new answers and the rationale for the change.
- The planting area was slightly reconfigured to include an additional 240 lineal feet along the Green River above the large wood project and decrease the overall width to between 100 and 120 feet . This change allows for the planting of a bench that had been covered with blackberry and will result in shade along more of the river in a high priority area, and avoids potentially contaminated soil in the actively used nursery area which would add significantly to the project cost.
  - The Large Wood Project and Native Plant Installation will both occur in the third quarter of 2018 for construction efficiency and because permitting and procurement delays made 2017 construction during the fish window not possible.

12. What regulatory review or permits are required for the project (e.g. HPA, Clearing and Grading permit, COE permits)? List any conditions or requirements included in the permit approvals relevant to placement of large wood in the project.

The following permits are required for this project:

- Clean Water Act Section 404 permit-U.S. Army Corps of Engineers
- Hydraulic Project Approval-Washington Department of Fish and Wildlife
- Grading Permit-City of Kent

Other permissions and agreements include:

- Aquatic Lands Lease-Washington Department of Natural Resources
- Eagle Management Plan
- Shorelines Exemption

The Aquatic Lands Lease agreement includes a stipulation that signage will be placed on the large wood project and 300 feet upstream to notify boaters of the structure. The Eagle Management Plan includes timing restrictions for construction within a certain distance of an active eagle nest. The HPA stipulates an in-water work window.

13. What specific actions or project elements were employed to address public safety in the final, permit-approved design?
- Actions to address public safety described in Section 1 have all been incorporated into the final designs. In addition, signage will be placed at the project and 300 feet upstream as part of the Washington State Department of Natural Resources Aquatic Lands Easement Agreement.
14. Describe how the project team solicited public input on the preliminary design. Describe the input received from the public and how, if appropriate, the project team has responded to this input.
- Public input was solicited at two Large Wood public meetings. The first was on June 8, 2016, and the second on June 7, 2017.
  - Approximately 1,400 meeting notices for each meeting were sent to a county-wide mailing list. In addition, 1,200 meeting notices were sent to residents adjacent to-or across the river from-the Teufel Large Wood project.
  - Section 1 of the Large Wood checklist and 30% design plans were posted on the King County large wood website and the Teufel Mitigation Project website in September 2016. At that time, a “request for comments” email was sent to a list of 121 people who had signed-up to get project updates for the Teufel project, in addition to 1,135 people who were signed up for notification of any large wood projects in King County. A two week comment period was posted.
  - No comments were received from either Public Meeting.
15. Describe any additional design modifications or mitigating actions that were or will be taken in response to the public comments.