King County

INSTREAM PROJECT CHECKLIST

For Construction and Maintenance of Flood and Erosion

Protection Facilities and Habitat Restoration Projects

that may include large wood elements

Project Name Porter Reach Restoration Project Project Manager Fauna Nopp

River/River Mile/Bank Green River/RM 34/Left Bank Date 06.09.2016

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

(Provide general information at a conceptual level)

1. Describe the goals and objectives of the project and its relative importance to the success of DNRP program goals and mandates. (Note: If the project is comprised of emergency work, then fill out and file this form within 30 days of completion of emergency work.)

The Porter Reach Restoration Project is a proposed levee removal and setback project on the Green River (RM 34) near Highway 18 and Soos Creek. The rock face and toe of a 900-foot section of the Porter Levee will be removed, and the top five feet of the levee will be excavated. The upstream part of the existing levee will remain in place to deflect the river away from private property to the south. A 1,000-foot-long biorevetment and a log deflector will be constructed to protect SE Green Valley Road. Bank wood clusters will be installed to roughen and harden the left bank along the Road. A 1,000-foot-long backwater channel will be created in the floodplain interior. Six logjams will be built in the floodplain. Native vegetation will be planted and snags will be installed. Weeds will be controlled. A culvert will be installed on the private property to the south to redirect drainage from the west side of the project site to the oxbow pond on the eastern side, improving flood conveyance. The goal is improve the survival of threatened salmon and trout by allowing the river to naturally erode its banks, form logjams, scour pools, and make side channels. The project will maintain the existing level of protection to private properties, infrastructure, and roadways. The project will comply with King County large wood placement policies and ordinances.

The project is listed as MG-17 in the WRIA 9 Salmon Habitat Plan. The project implements two Tier 1 Conservation Hypotheses (MG-1, MG-3). It is a high priority in the following plans:

- Green/Duwamish River Ecosystem Restoration Study (USACE 2000);
- Middle Green River Restoration Blueprint (King County 2006); and
- Middle Green River Levee Setback Feasibility Study (Bowles et al. 2013).

2. Describe the existing (and historic, if relevant) site and reach conditions, including structural features, channel form, and the presence of naturally-deposited large wood.

In the early 1900's, the project site was island-braided and contained abundant side channels, logjams, and dense trees and shrubs (Figure 2). Human impacts began in the early 1900's with floodplain clearing and early levee and revetment construction. In the 1960's, habitat conditions were profoundly altered by the construction of Howard Hanson Dam and the channelization of the river by levees, including the Porter Levee. Those actions combined to convert the river to a largely single-threaded form and to isolate

much of the former floodplain and off channel habitat. The riparian areas and floodplain were mostly cleared for agricultural production.

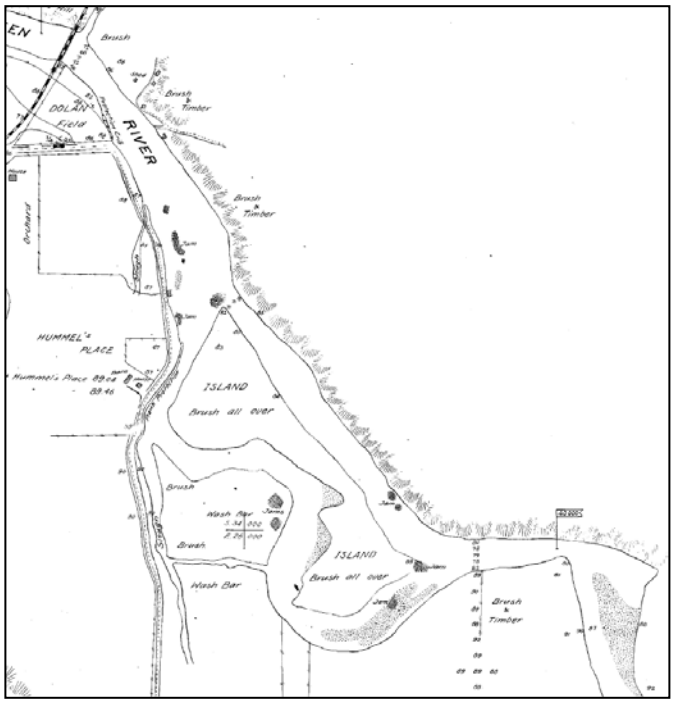

FIGURE 1. PORTER REACH IN APPROXIMATELY 1907.

King County constructed the Porter levee on the site in 1961. The levee is approximately 1,700 feet long. The riverward face of the levee is covered in large angular rock. The levee core is composed of streambed gravels and heavily vegetated with trees and shrubs less than 55 years old. The levee was damaged in the 1980's and repaired by the U.S. Army Corps of Engineers (USACE). Floods breached the downstream portion in 1990 and 1996, producing small side channels that persist today. A raised berm of unknown origin, design, or composition runs along the southeastern portion of the project site, next to and parallel with the SE Green Valley Road. No other structures are present on the site.

King County purchased the property on the left (west) bank in 1998 and the right (east) bank in 1999.The project site is managed as 'ecological land' (Porter Levee Natural Area) by the Natural Resource Lands Program (King County Dept. of Natural Resources and Parks). The management goals are to conserve and enhance ecological value and to accommodate passive recreational use.

In 1999, the U.S. Army Corps of Engineers, in partnership with King County, completed a restoration project at Porter levee, under the Section 1135 Program, which allowed for rapid design and construction. The project consisted of breaching the levee in two places to provide fish with access to a 1.7-acre oxbow pond formed by the construction of the levee.

The current channel is approximately 100 feet wide and runs in a single thread along the Porter Levee, to the west, and along a densely vegetated bank to the east. The topography of the project site is relatively flat in the valley bottom, with steep slopes of the valley wall to the northeast (Figure 2). Channels and swales are located throughout the project area. The project reach currently contains little instream large wood, except for one logjam on the left bank near the downstream end of the site. This jam has been stable through floods for a number of years and has accumulated several dozen additional pieces over time, forming an upstream scour pool and a downstream bar.

3. 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 project site is adjacent to the SE Green Valley Road (GVR) and private lands west of the right-of-way. To the south is the privately owned Mosby Farm. This farm is in the Upper Green River Agricultural Production District and enrolled in the Farmland Preservation Program. A series of bridges are located on the northern boundaries (i.e., Neely Bridge, a railroad

bridge, and Highway 18 bridge). The Green River is used for recreational fishing and boating. Across the river, and south of the site, is the publicly-owned Neely Natural Area. The property to the west –across the road—contains a retail butcher and convenience store. The property to the east is a natural area owned by the public of King County. The northern property contains a boat launch/take-out owned and managed by the Washington Dept. of Fish and Wildlife. There is no trail corridor at the site, and no primary schools are nearby. Green River Community College is 6.7 miles away, by road. The Porter Levee Natural Area is managed by the King County Parks Division, and is in close proximity to other natural areas used for outdoor recreation (i.e., Auburn Narrows and Soos Creek Natural Areas) project sites.

The Green River is also used for instream recreation, but use varies among locations, according to a recreation study completed by King County (King County 2013). The study indicates that relatively few people recreate in the river at the Porter project site, compared to the Whitney Bridge and 'Beer Can Beach' sites, which are upstream and downstream (respectively) of the project site. The study found that at the Auburn-Black Diamond Road site (RM 33.4), on an average summer day, three people float past the Porter Levee. Roughly three-quarters of those observed were characterized as adults in tubes without paddles or life vests.

4. 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.

Large wood element	Amount	Size	Location	Orientation	Elevation	Anchoring techniques	Type of interaction with the river at range of flows
GVR Deflector Jam	1	Extend 60 feet from the rock revetment and approximately 60 feet along the water-ward face. The entire deflector is approximately 8-feet high with the bottom containing a layer of 16 logs 24-inch diameter x 30 feet in length.	Placed at the downstream end of the biorevetment to deflect the river away from Green Valley Road into the floodplain.	One row of logs arranged in a semi-circle with rootwads facing out into the floodplain.	From streambed to approx. 100-year flood elevation. (elevation 75- to 83-NAVD)	Boulders	No interaction until channel migrates into them, then interacting with river at all flows
Habitat Jams	6	Buried jams contain nine pieces of wood ranging from 10- to 24-inches in diameter and 30- to 50-feet long. Exposed (not-buried) jams contain 21 pieces of wood ranging from ten to 24inches in diameter and 30 to 50 feet long.	Forested floodplain	Key member(s) with upstream-facing rootwad and racked members against and behind the rootwad oriented perpendicular to flow, with some angled members on the sides	Three jams are buried and three are placed at existing grade.	Deformable, but stability enhanced byracked logs, native fill ballast, and native tree plantings.	No interaction until channel migrates into them and exposes them, then interacting with river at all flows

Bank wood clusters along GVR	Approx 500 linear feet	8 logs per cluster; four at 24-inch diameter x 25 feet long, four at 24-inch diameter x 60 feet long.	On left bank of inside channel parallel to Green Valley Road	4 parallel to flow and 4 at approx. 45-degree angle upstream	Top of existing side channel bank logs will be approximately 2-feet above existing grade.	4-5-foot diameter boulders (approx.. 4 per cluster) attached to the wood.	No interaction until channel migrates into them, then interacting with river at all flows

5. What is the intended 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 woody debris that may be floating in the river?

Large wood element	Intended function	Role in meeting project's goals and objectives	Intended to recruit additional wood?
GVR Deflector Jam	To deflect flow away from the setback levee towards the project floodplain area and prevent flow from becoming fixed along the levee for longer than five years. Other functions include retaining wood, providing large-scale hydraulic roughness to reduce flow velocities and encourage sediment deposition, create habitat by creating pools, substrate for aquatic insects, and a foundation for riparian vegetation growth.	The GVR deflector jam is intended to push the river away from SE Green Valley Road and to at least temporarily provide instream cover for fish if the river eventually reaches biorevetment. The deflector is also intended to prevent the channel from entraining (getting stuck) on the biorevetment. This jam should help to force ongoing channel adjustment and promote a meander-cutoff cycle over the long-term, which is good for fish habitat.	Yes
Habitat Jams	To replicate the function of pre-existing, buried logjams when they are eventually contacted by the migrating channel. Once exposed, they are intended to create scour pools, side channels, and backwaters, and to trap wood from upstream.	Habitat jams enhance instream habitat for fish and help to keep the channel migrating laterally, and then cutting off, repeatedly. Over many years, this cycle helps to create a patchwork of diverse habitats.	Yes
Bank wood clusters	To provide bank protection and flow resistance features on the landward (west) bank of the old side channel(s) between the mainstem river and GVR to reduce the likelihood that the entire channel will move into the existing side channels and erode the GVR prism.	Bank wood clusters will provide a small amount of protection to the GVR embankment but are not designed to protect GVR the Green River mainstem. If either of the mainstem channel threatens to contact the GVR where bank wood clusters are present, additional measures may be necessary to protect GVR.	Yes

6. Describe how public safety considerations have been incorporated into the project design [see section 1.B.2 of Ordinance 16581] and include a description of how the six (6) key steps provided in Public Rule LUD 12-1, Appendix A. (Rule) Section V.2.A. i)-vi) have been addressed.

Step	Public Safety Considerations	How considerations could be addressed
1	Expected type, frequency and seasonality of recreational use	• Design based on 2013 recreational study that documented relatively few people recreate in the project area, but many of those that do are unskilled, passive floaters without PFDs.
2	Location, Orientation, Elevation, Size, Anchoring methods, Degree of interaction between flowing water and the placed wood during projected flow regimes,	• Habitat jams located at the up-stream end of the existing levee and adjacent to the main stem of the river have been removed.

	including flows commonly experienced in the recreational seasons	• The number of habitat logjams has been reduced from 10 to six and they have been moved away from the existing channel. This improves safety because it allows the river to widen substantially before encountering the logjams through channel migration. A large gravel bar will likely form on the right bank, which will provide users with another portage route past most of the placed wood.
3	Input received through the public outreach process	• Requests for realignment of the rootwads in the deflector jam along Green Valley Road are under consideration for 60% design revisions.
4	Maximize achievement of project goals and objectives while minimizing potential public safety risks. Seek to ensure that the procedures and design options affording the greatest safety for river users are of primary consideration in design concerns. Balance important public purposes as it addresses safety issues.	• If hazard develop, warning signs will be posted at upstream river access points and on the left bank upstream from the project site as appropriate. The signs would alert users to the hazard and identify portage routes and/or takeout locations. • A portage trail could be made on the right bank to allow people to find safe passage around the logjams.
5	Design informed by standard design practices.	• Design informed by Army Corps of Engineers levee standards, King County Design Manual, and King County zero-rise standards. Deflector jam designed by licensed engineer with relevant experience. Habitat jams designed by river ecologist and geologist with relevant experience and approved by licensed engineer. Habitat jam design based on naturally-occurring structures and experiences from previous levee setback projects.
6	Review and approval from a Licensed Professional Civil Engineer.	• Design approved by professional engineer (W. Mansfield, P.E., Engineer of Record)
7	Review and approval from a professional ecologist.	• Design approved by professional Ecologist (J. Latterell, Ph.D.)

7. What is the anticipated schedule for completing project milestones (30-40% design, final design, major construction/earthmoving) and for soliciting public input)?

30% completion – February, 2016

100% completion – February, 2017

Construction – summer, 2017

Public input – 30% website posting, annual LW public mtg.

Project Manager Date

Supervising Engineer, Project Supervisor or Unit Manager Date

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*

8. 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.

9. The Rule requires project review and approval by a Licensed Professional Civil Engineer. The Engineer will ensure appropriate application of engineering studies and design standards. Describe the design review and approval process for the project, including review by the licensed professional engineer, as well as reviews by other licensed technical staff such as 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. Was the review and approval completed?

10. The Rule requires project review and approval 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. The Ecologist will 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? Please describe steps undertaken by the Ecologist.

11. 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.

12. What specific actions or project elements were employed to consider public safety in the final, permit-approved design?

13. Describe how the Public Outreach requirements in Rule Section V.3. have been addressed.?

14. Describe the input received from the public and how, if appropriate, the project team has responded to this input.

15. Describe any additional design modifications or mitigating actions that were or will be taken in response to the public comments.

16. Will further educational or informational materials be made available to the public to heighten awareness of the project (e.g., public meeting, press release, informational website, or temporary or permanent signage posted in the vicinity of the project)? If so, explain.

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Project Manager Date

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Supervising Engineer, Project Supervisor or Unit Manager Date

III. Post-Construction Actions or Project Modifications

17. Have any answers provided in Sections I and II at the Preliminary design and Pre-Construction phases changed in the interim? If so, provide the new answers and the rationale for the change.

18. In accordance with the requirements of Rule Section V.4.,describe post-construction monitoring and inspection activities planned for the project.

19. If post construction monitoring or inspections result in modifications to the project, please describe the action taken and the rationale (See Rule Section V.4.).

Project Manager Date

Supervising Engineer, Project Supervisor or Unit Manager Date