

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 Taylor Creek Mitigation Project

Project Manager Dan Eastman

River/River Mile/Bank Taylor Creek, both banks

Date 8/7/18

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 *Cedar River Basin and Nonpoint Pollution Action Plan* (Cedar River Basin Plan) specifically highlights the value of restoration work along Taylor Creek (King County, 1998). The Cedar River Basin Plan acknowledges the expected changes in stream habitat due to increased human intrusions from new development and recommends protecting and restoring aquatic habitat in reaches of Taylor Creek with additions of large wood and conifer plantings (King County, 1998). The Cedar River Basin Plan highlights a significant flooding problem along 225th Avenue SE and Maxwell Road SE which is exacerbated by Taylor Creek. The Cedar River Basin Plan recommended implementation of the Taylor Creek Channel Relocation Project (CIP 3140) downstream of the TC Mitigation Project, noting its value to the Cedar River Basin. The TC Mitigation Project will extend that completed work and increase the value of the Taylor Creek Channel Relocation Project.

King County completed the downstream Taylor Creek Channel Relocation Project in 2005 and 2006 to help abate the flooding along 225th Avenue SE and Maxwell Road SE by realigning Taylor Creek away from the road and providing increased flood storage capacity within the re-established wetland. The TC Mitigation Project will extend the wetland re-established by the Taylor Creek Channel Relocation Project upstream and further increase flood storage capacity.

The Cedar River Basin Plan also highlights the value of Taylor Creek including the following:

- This reach of Taylor Creek supports some of the highest densities of spawning sockeye salmon seen anywhere in the basin planning area.
- Reconnecting Taylor Creek with its historical floodplain will provide an area where stream sediment could be deposited without serious harm to either the natural or built environments. This would also create a wide, well-vegetated riparian wetland corridor, improving habitat and water quality biofiltration.
- Moving buildings will reduce damage from flooding events.
- Additional sediment reduction is expected to result from placing large wood and revegetating the upstream channel.

The Cedar River Basin Plan identifies the highest concentration of livestock in the Cedar River Basin in the Taylor Creek subarea. Direct access by livestock to the stream and the lack of adequate livestock management have degraded Taylor Creek's water quality (King County, 1998). The TC Mitigation Project removes livestock use on the TC Mitigation Project property, which included horse pasturing, a 35-stall equestrian barn and a 7-stall stud barn.

The Cedar River Basin Plan makes the following general recommendations for the Taylor Creek subarea that highlight the value of the TC Mitigation Project:

- Facilitate siting of aquatic resource mitigation sites in the subarea.
- Encourage landowners to retain their forest in the rural areas of the basin to ensure that the Cedar River has clean, stable streams. The TC Mitigation Project protects forest on the eastern side of the site.
- Focus on controlling the peak, volume, and duration of run off by means of infiltration or detention, in order to help reduce the expected future habitat problems associated with the flooding and erosion in the Taylor Creek subarea. The TC Mitigation Project removes significant impervious surface with the demolition of the two large barns and a home that were onsite.

The TC Mitigation Project supports implementation of the recommendations in the Cedar River Basin Plan and the Taylor Creek subarea has been identified as important for the watershed. The importance of restoration along Taylor Creek was specifically highlighted in the Cedar River Basin Plan further justifying the selection for Taylor Creek Mitigation Project as a mitigation project that addresses threats to the watershed and supports the watershed planning processes completed in the Cedar River/Lake Washington Watershed.

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 Taylor Creek Mitigation Project will restore the floodplain topography, connectivity, wetland plant communities and wood density that likely existed in this reach of Taylor Creek prior to residential and agricultural development. Project objectives include the following:

- Create ~ 4 acres of aquatic, emergent, scrub shrub and forested wetland;
- Enhance ~0.5 acre of existing wetlands and over 8 acres of upland forest;
- Create off-channel aquatic areas adjacent to Taylor Creek to provide rearing and refuge habitat for juvenile salmon;
- Install large wood in created off-channel areas;
- Install wildlife habitat snags and debris piles for nesting and foraging; and
- Install native plants throughout the ~12 acres of restored stream, wetland and upland areas
- Remove one existing bridge and replace another bridge with a pedestrian bridge that conforms to hydraulic code.
- Remove existing utility lines and a concrete bulkhead from the stream and restore native streamside vegetation
- Install a shallow berm adjacent to Taylor Creek to contain flooding from beavers downstream

The project is sponsored by King County's federally certified In-Lieu Fee Program and will include riparian/floodplain type mitigation consisting of wetland, stream and buffer components to mitigate for impacts to aquatic habitat elsewhere in the Cedar River/Lake Washington Service Area including King County Solid Waste Division's Factoria Recycling and Transfer Station Replacement Project (Corps permit # NWS-2012-952), a portion of impacts associated with the Washington State Department of Transportation's State Route (SR) 520, Portage Bay Bridge Phase Project (Corps permit # NWS-2008-1246) and Sound Transit's Operations and Maintenance Facility: East Bellevue, Washington Project (Corps Permit # NWS-2016-097). This reach of Taylor Creek has been channelized for flood control, resulting in lost connectivity with adjacent floodplain wetlands – many of which have been filled to promote agriculture and residential development. The total project area is approximately thirteen acres, with about four acres of proposed wetland and aquatic habitat restoration and eight acres of upland enhancement.

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.

Taylor Creek is about eight miles long and drains an area of approximately five square miles. It flows through low density residential areas in its headwaters and continues through the Taylor Creek golf course before crossing under State Route 18 and dropping fairly steeply into the 100 year floodplain of the Cedar River. During the summer months, flow is less than 5 CFS and the 2, 10, and 100 year flood events are 100, 150 and 200 CFS, respectively.

The proposed project lies within what would likely have been the historic alluvial fan of Taylor Creek. In this area the steeper stream drops onto the lower gradient Cedar River floodplain. The Taylor Creek floodplain is fairly confined upstream of the site

and within this site expands more than threefold in width. Grading and fill throughout the floodplain have degraded historic floodplain habitat – in particular on the right bank where floodplain wetlands were likely filled to create pastures and build structures.

Although the riparian corridor along portions of Taylor Creek within the project site is healthy with mature native trees and shrubs, stream habitat is moderately degraded through the project reach, with low abundance of large wood and a portion of streambanks either infested with Himalayan blackberry or maintained within landscaped yards. There are also two undersized bridges over the stream, a utility line running over the stream and some minor bank hardening along the left bank.

The parcels acquired for the Project had been a single family residence and farm since the early 1900's. All structures on the project site were demolished in the summer of 2017. There is evidence of considerable fill and compost material within test pits dug for wetland delineation and groundwater well installation. The project site has mostly been cleared of native trees and shrubs. Historically, the Puget Sound lowland forests in this area were dominated by dense coniferous forests most commonly made up of western red cedar, western hemlock, and Douglas-fir. Periodic flooding and infrequent fires were once the predominant disturbance regimes in the region. This reach of Taylor Creek supports some of the highest densities of spawning sockeye salmon seen anywhere in the basin planning area.

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?

Adjacent land use is primarily residential. There is no recreational use within the project area. There are no trails, school or parks within close proximity. Taylor Creek is a small stream and not floatable during the summer months. The project site is approximately one mile upstream of the confluence with the Cedar River, which is heavily used by recreational boaters/floaters.

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.

No wood will be placed within the OHWM of the stream, but approximately 150 pieces of large wood will be placed in the wetland adjacent to Taylor Creek. Wood is clustered in groups of 2-4 pieces in deeper aquatic areas of the off-channel wetland where Taylor Creek has potential to flow through in the future, but not in the near-term. Clustered wood was successfully used to provide stability to placed wood at the downstream Taylor Creek Channel Relocation Project. In drier floodplain areas, individual pieces of placed wood will rely on stem density of planted trees and shrubs for stability. It is highly improbable that any wood will mobilize and move downstream in Taylor Creek.

While all logs appear the same in figures, there will be considerably variation in the size, species and age of placed wood. A mix of deciduous and coniferous logs is beneficial and consistent with natural analogues – as is a range of fresh and older wood. Use of deciduous trees can result in an increase in overall volume of wood when deciduous logs are available for onsite harvest. However, at least 40% of the placed logs will be coniferous trees with intact rootwads that will provide long-term structure within the wetland until trees are large enough to start recruiting naturally from onsite.

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?

Large wood will be placed throughout all wetland areas at a density similar to that placed at the downstream Taylor Creek Channel Relocation Project where large wood is serving many critical functions within aquatic areas and other drier floodplain areas. The primary objective of the wood is increase habitat value and wetland functions.

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.

The project is not expected to affect the recruitment or mobility of existing natural large wood. It is likely that the rootwads will accumulate small natural wood that will benefit aquatic organisms. Some large natural wood could also move into the aquatic areas at very high flows from upstream, but that is not likely given the size of the stream.

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;

There is no floating, boating or known recreational use on this creek.

- b. Wood location, positioning, and anchoring techniques;

All wood will be placed in the created off-channel wetlands and not the main channel of Taylor Creek. Wood will be stabilized in clusters to ensure that no wood moves downstream into Taylor Creek or the Cedar River.

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

No wood will be placed in the main channel. There is negligible risk to public safety.

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

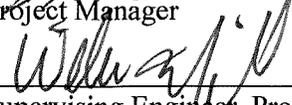
The project team consists of professional ecologists, and engineers. The project will also go through the permitting process and be reviewed and approved by the IRT committee and with state and federal regulators.

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?

Will Mansfield is the Engineer of Record for the project. Yes, reviews and approvals were completed.

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)?

Dan Eastman, is the Project Manager and Environmental Scientist IV working on the design along with Cody Toal, Environmental Scientist II. Mr. Eastman is the reviewing ecologist and the review was completed. The project will complete 60% design products in August 2018 with public input through the SEPA process and other more focused local outreach. Final design will be complete by the end of January 2019 and the project will be constructed in 2019.

 Project Manager	8/10/18 Date
 Supervising Engineer, Project Supervisor or Unit Manager	8/10/18 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 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.

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.

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

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.

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.

17. If the project is expected to influence the recruitment, mobility or accumulation of natural wood, has a Public Safety Management Plan been completed?

Project Manager	Date
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Supervising Engineer, Project Supervisor or Unit Manager	Date
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