Project Review Comments

PROJECT: 21-1107 R, The Shire - Ecosystem Restoration

Sponsor: Cowlitz Indian Tribe Program: SALMON ST PROJ Status: Application Resubmitted

MEETING: Initial Review

Shared: 4/2/2021

Review Status: Needs more information

Considerations: Scope concern, Other

Topics	Comments
Review Status - Initial	
	Need more information on the long term sustainability of treatments used to overcome the passage barrier at the bedrock sill. The sponsor proposes to notch the bedrock and then use anchored LWD in a roughened channel to overcome the slope. However, given the nature of the floodplain surrounding the spring fed creek, there will be very little future supply of wood to naturally maintain LWD in the area.
Review Panel Comments - Initial	
Questions (response required)	
	The goal of the project is to provide perennial access to Yeon Springs. Is it expected that fish will use it year round or during specific times of the year?
	Reply: Fish use is expected to occur year-round if fish passage is available. The highest fish use is expected to occur in the summer when local and out-of-basin salmonid juveniles are seeking thermal refuge from the sub-lethal/lethal surface water temperatures of the Columbia River.
	What are the sources of spawning sized gravel that can replenish spawning material in the restored area?
	Reply: There is little to no gravels within Yeon Springs. The natural transport of sediment from the headwaters of Yeon springs is interrupted by the BNSF railroad. . This severely limits the transport of any spawning size material to Yeon Springs. The placement of spawning gravel will not be replenished naturally.
	Is it expected that there will be spawning habitat in the area where BDAs are being used as well as the roughened channel area?
	Reply: Spawning gravels will only be placed behind the bedrock sill logs of the roughened channel. The BDA installation areas do not have enough gradient and flow to support the placement of spawning gravels.
Improvements to Make Project Technically Sound (response required)	
	Please provide a more detailed outline of how the extensive reed canary grass will be dealt with at the site. Does this need to be dealt with prior to other improvements to the spring channel being implemented? The scope of work clearly shows the timeline for herbicide and subsequent planting. It is a little less clear when the BDA portion of the project is intended to occur. Is this happening concurrently with the work on the bedrock sill or at some later stage?

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	Reply: The RCG herbicide application will occur in three phases, starting in the spring, fall and the spring (then summer construction) of the following year, depending upon timing of securing permits. The timing could change to a fall, spring, (the summer construction), and fall treatments as well. These treatments will effectively treat/kill all foliage as well as the root mass and the new seeds as they attempt to sprout the following spring. The three phased herbicide approach is expected to reset the riparian community and eliminate the current RCG infestation and give a jump start to the native riparian planting installed in the fall after summer construction. The instream construction portion of the project will occur in the summer time, during low flows. The contractor will concurrently lower the bedrock sill and place BDA and complexity wood structures in the Yeon springs channel.
	Please provide more information on the long term sustainability of the treatments used to overcome the passage barrier at the bedrock sill. The sponsor proposes to notch the bedrock and then use anchored LWD in a roughened channel to overcome the slope. However, given the nature of the floodplain surrounding the spring fed creek, there will be very little future supply of wood to naturally maintain LWD in the area. Will the project require periodic maintenance to provide long-term access?
	Reply: The project is not expected to require periodic maintenance to provide long-term fish access to Yeon Springs. The placed sill logs will remain underwater the majority of the time and decay is expected to be minimal. Future sources of LWD are limited and expected to be short-lived. This is why we plan on placing large amounts of confier logs within the project site. The riparian restoration efforts are expected to provide long term sources of LWD, but this won't occur for 50+ years.

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MEETING: LE Review

Shared: 4/16/2021

Topics	Comments
Lead Entity Comments	
Questions For Applicant	
	Subsurface connectivity with the river is fast, and extends beyond this site. Are you saying this overrides flow contributions from the springs on the property? Can you clarify the goals relating to the cold-water plume in the Columbia River?
	Reply: Goal: Restore perennial fish access to wetlands and surrounding cold-water spring tributaries to improve the survival and fitness of juvenile migrants headed to the ocean. Collectively these actions will expand wetland habitat capacity and function for rearing needs of both in-basin and out-of-basin juvenile salmon and steelhead. The proposed roughened channel will not effect the creation of an attractive cold water plume at the confluence of Yeon Springs with the Columbia River. The roughened channel design creates a plume into the Columbia until the site is completely backwatered during high flows encountered in the Spring.
	Given the system is bedrock dominated, can you talk about how you plan to excavate the site and anchor materials? How deep do you plan on excavating the channel?
	Reply: The hired contractor will use a hydraulic jack hammer mounted to an excavator to chisel 4-5 feet of bedrock, estimated at 200 cubic yards. Once the bedrock has been removed, the contractor will drill 1 1/8th inch holes into the bedrock on either side of the placed logs and fill 2/3rds of the hole with epoxy. Crews will install a 1-inch threaded rod anchors and secure a section of chain to strap the log down to the bedrock. The secured logs will be covered with a layer of geo-tech fabric and backfilled with alluvium.
	Where do you plan on acquiring stream bed gravels from?
	Reply: The hired contractor will acquire the stream bed gravels, likely from a local source.
	Are there funding sources that could support post-implementation physical habitat and fish monitoring of the project?
	Reply: Generally speaking, monitoring funding is not available to most projects. Some monitoring will be done on the site as part of the Columbia Estuary Ecosystem Restoration Program (CEERP) Action Effectiveness Monitoring (AEMR). It is unknown at this time what level of monitoring will be done. The minimum amount will be water surface elevations, water temperature, sediment accretion and photo points. Once the project is fully funded, staff will coordinate with BPA and Fish Biologist from USGS to see if this site could be outfitted with a floating PIT tag array, however detections might be limited when the site is backwatered during high Columbia River spring flows.
	Elaborate on the Hamilton Creek reed canary grass remediation work you reference: what is the project number, and how have lessons learned from this project informed your proposed work?

	Reply: The spawning gravels within Hamilton spring chum channel were covered with reed canary grass (RCG). The Lower Columbia Fish Enhancement Group used a portion of BPA funds and SRFB monies (Hamilton Creek Restoration Phase II #10 -1025) to replace all of the old chum channel spawning gravels covered with RCG and placed stacked logs along the channel toe to minimize inputs of soil erosion into the channel. This technique did not transfer over to our RCG approach at the Shire. The excavation of RCG within the Category II & III wetland soils of the Shire would not be effective since this would also remove the topsoil and also miss some of the long RCG roots. The current approach will use herbicide to treat both the RCG on the surface as well as the root mass buried deep into the wetland soils. This approach has been effectively to treat RCG in the Olympic Peninsula and is intended to reset the channel margins to give a jump start to riparian replanting efforts.
	How long do you expect it will take to make substantial gains in reducing reed canary grass on the site, and can you elaborate on the timeline of activities to support reed canary grass reductions?
	Reply: The RCG herbicide application will occur in three phases, starting in the spring, fall and the spring of the following year. These treatments will effectively treat/kill all foliage as well as the root mass and the new seeds as they attempt to sprout the following spring. The three phased herbicide approach is expected to reset the riparian community and eliminate the current RCG infestation and give a jump start to the native riparian planting installed in the fall after summer construction.
	Have you considered leaving the bedrock sill in place? And, if rock is excavated to create step-pool formation with wood sills, what will happen when the large wood deteriorates? Could this create a barrier, or the need for long-term maintenance to maintain large woody material? Concerned existing stream power won't support large wood transport to the site naturally.
	Reply: The early conceptual design drawings for this site, secured logs to the surface of the bedrock, however the un-even undulation of the bedrock and expanse of grade log coverage sealed to the bedrock made this approach ineffective. The proposed bedrock excavation creates a single thread channel and isolates flow. The placed sill logs will be covered with water or underwater the majority of their lifespan and preserve the logs to increase their longevity. The 18 inch diameter (or larger) conifer sill log will not deteriorate quickly and expected to remain in place for a minimum of 20 years and likely much longer. Precision excavation of bedrock to form pools was considered, but bedrock can break unexpectedly, which could impact fish passage conditions. Since, fish passage is the primary goal of this project and remedies for uncontrolled bedrock breakages are limited, over-excavating bedrock and building the fish passage channel back up was deemed the most prudent way to provide fish passage. There are limited sources of large wood on this project site, however once food is available (i.e., riparian and cover planting) we expect beavers will utilize this location and build dams that will function much like a single piece of large wood. These dams will raise the water surface level and flood portions of RCG thickets and eliminate their presence.
	Clarify how you will create spawning habitat based on the proposed design. Concerned that low gradient and related stream flow may limit spawning habitat potential.

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	Reply: The Yeon springs outlet channel will have spawning gravels placed at the tail-out of each sill log. The inter-gravel flow and warm spring waters in the spring will make this an attractive location for all lower Columbia River Gorge salmonid species, such as coho, chinook and chum salmon and winter steelhead. The outlet channel has 2 percent gradient and plenty of flow to create the necessary conditions for spawning salmonids.
General Comments	
	Consider reaching out to Columbia Land Trust, Friends of the Gorge Refuge, Clark PUD, and LCEP on reed canary grass removal.
	Reply: The reed canary grass herbicide treatment approach has been vetted through the Columbia Land Trust, Friends of the Gorge, Clark PUD and the 10,000 Years Institute. All parties agreed this was the best approach to treat this site with the surrounding regulatory constraints and impacts to the Category II & III wetlands within the Columbia River Gorge floodplain.
	Incorporating beaver recolonization and riparian restoration into the project makes a lot of sense given the reed canary grass on site.
	Reply: We agree as well. This site will always be encumbered with RCG and transported of RCG seeds after each Columbia River highwater event. This approach allows the jumpstart of a new riparian growth to overtake the treated RCG population and entice beavers to build dam to flood RCG thickets.
	It is assumed that this project would primarily provide cold water rearing habitat for juvenile salmon.
	Reply: This site offers excellent rearing habitat not only as a cold water refuge in the summer but also for rearing salmonids in the winter time. Yeon Springs was 5-7 degrees Fahrenheit warmer that the Columbia River and these instream temperatures will increase over-winter survival and increase growth rates for rearing salmonids.