Project Review Comments

PROJECT: 21-1098 R, Beaver Reach Side-Channel Restoration

Sponsor: Mid-Columbia RFEG Program: SALMON ST PROJ Status: Application Resubmitted

MEETING: Initial Review

Shared: 4/2/2021

Review Status: Needs more information

Considerations:

Topics	Comments
Review Panel Comments - Initial	
Improvements to Make Project Technically Sound (response required)	
	The project proposal should provide more geomorphic context about the site. While the project sponsor has done extensive hydrologic modeling, very little information has been provided about how future sediment transport and deposition could impact the long-term success of the project, particularly considering its location just downstream from a confined reach and the effects of campground infrastructure on the floodplain (e.g., entrenchment, bank stabilization).
	Reply: The Beaver Campground Reach was historically a depositional area with multiple active channels that meandered across the floodplain. At the upstream reach break, a natural constriction is present from a bedrock outcropping that confines the channel against the east valley wall. The campground was constructed below that natural pinch point in what was historically an active channel. To mitigate flooding of the campground the USFS constructed an elevated and armored berm for the length of the campground. After the berm and continued constriction of the channel, the floodplain is open to continue a meandering pattern. If historical large wood loading regimes were present, the floodplain below the campground would be active with side channels and other off-channel habitats. However, this is not the case and large wood recruitment in the Wind River has been limited by timber harvest to the river edge throughout most of the whole watershed. Constructing large wood complexes at the side channels below the campground infrastructure will proved a stop gap measure until future wood recruitment is available. Once the side channels are activated, energy from the river will be dissipated from a confined channel form to an anastomosing channel form and subsequent deposition of sediment and woody debris will occur between the side channel entrances and the side channel exit. As this deposition within the proposed project area occurs it will set the stage for future work upstream work to remove the berm and reactivate more of the floodplain. A visual with sediment modeling is attached showing expected sediment depositional areas.
	The project sponsor should include a LiDAR bare-earth shaded relief of the project reach to help show the geomorphic characteristics of the site. A simple screenshot of the project area from the Washington Department of Natural Resources LiDAR portal would be satisfactory.

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	Reply: An attachment was added with lidar images showing geomorphic characteristics of the proposed project.
General Comments (response not required)	
	The project sponsor is still evaluating important details about the project design including inlet elevations for the side channels and the amount of perennial flow within each side channel. The Review Panel is likely to condition the project for further design review once these details have been addressed.
	Reply: After visiting the site this spring and taking elevation points the USFS has decided to use the elevations described in the preliminary design and expect to incorporate these elevations into the final design. We have attached a document with maps that show a campground map, lidar, velocity model, and critical grain size model. The project sponsor will accept a condition for design review.

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MEETING: LE Review

Shared: 4/15/2021

Topics	Comments
Lead Entity Comments	
Questions For Applicant	
	What is the proposed inundation elevation and seasonality of the side channel relative to the mainstem Wind River? The mainstem goal is to aggrade the channel but the USFS goal is to support perennial flow in the side channel, which implies a lower main channel elevation is necessary. The design sheets will need to be updated to reflect these desired outcomes, and modeling is likely required to support the project design.

	Reply: After visiting the site this spring and taking elevation points the USFS has decided to use the elevations described in the preliminary design and expect to incorporate these elevations into our final design. The USFS will apply the following the description from page 10 and 11 of the preliminary design: Enhancement of three existing side channels (referred to as the lower left side channel, upper left side channel, and the right side channel) are proposed within the design reaches. The inlet to each side channel will be located on the outer bend of river meanders, and the proposed flow paths follow existing floodplain channels to minimize excavation quantities and riparian impacts. The lower left and right side channels are proposed to activate during average summer flows with a flow depth of approximately 3 inches at this stage. The upper left side channel is proposed to convey winter flows with 12 inches of depth during the average winter flow conditions. In all cases, the excavation quantity, and thus the frequency of engagement, was balanced with the expected benefit. The right side channel alignment will be approximately 1,250 feet long and consists of selective excavations along an existing flow path behind a vegetated gravel bar on river-right. A 325-foot long secondary flow path will also contribute flow from the mainstem to the lower portion of the right side channel, and also consists of enhancing an existing flow path that traverses the gravel bar. The 1,100-foot-long lower left side channel is proposed on river-left and follows a shallow existing depression. The upper left side channel alignment is also proposed on the left floodplain and will travel 1,600 feet through a relic floodplain channel until its confluence with the lower left side channel. Natural depressional channels branch off the lower and upper alignments and will further encourage wetland formation and habitat diversity. An apex-style log jam is proposed at each side channel inlet to help maintain the inlet depth via scour and to constrict the mainstem cross-section to encourage flow to enter the side channel. Log placements and structures are proposed throughout the side channels for added channel complexity and diversity. Pools and riffles will be graded into the side channel to increase habitat and geomorphic complexity. Pools will be associated with log structures to help maintain pool scour and complexity.
	More application details are necessary to understand the desired side channel flow and sediment outcomes, and associated tradeoffs, between the submitted preliminary design and outstanding design decisions.

	Reply: After visiting the site this spring and taking elevation points the USFS has decided to use the elevations described in the preliminary design and expect to incorporate these elevations into the final design. We have attached a document with maps that show a campground map, lidar, velocity model, and critical grain size model.
	Is the proposed side channel work considered to be habitat enhancement or creation? What is the existing connectivity of the side channel?
	Reply: The existing side channel is a Q1.5 activation and has low habitat complexity, with very little large wood within the side channels. The proposed work is considered habitat enhancement with side channel flow goals at 3 inches during summer flow. Please see answer to question on side channel flow.
	Have you considered focusing on off-channel habitat instead of side channel habitat? Off-channel habitat may reduce the risk of juvenile fish stranding, mainstem flow impacts and potential for habitat disconnection. Design materials should highlight how juvenile stranding is avoided. Constructing off-channel habitat will also reduce concerns about splitting mainstem flows.
	Reply: The design focuses on both off-channel and side channel habitat by placing large wood within mainstem and side channels. Existing side channels already cause juvenile fish stranding. The proposed enhanced habitat should help improve fish stranding. Placement of sufficient large wood roughness in the side channels and floodplain will alleviate concerns about capturing or splitting the mainstem beyond the designed parameters.
	Additional information is needed on broader geomorphic conditions, such as sediment processes, river confinement and/or migration, and bed elevation conditions that are important to consider when reviewing the design. Consider in the design approach that the upstream stream reach is confined, whereas the campground reach where the project is situated is largely unconfined.
	Reply: The Beaver Campground Reach was historically a depositional area with multiple active channels that meandered across the floodplain. At the upstream reach break, a natural constriction is present from a bedrock outcropping that confines the channel against the east valley wall. The campground was constructed below that natural pinch point in what was historically an active channel. To mitigate flooding of the campground, the USFS constructed an elevated and armored berm for the length of the campground. Downstream of the berm and constricted channel, the floodplain is open to continue a meandering pattern. If historical large wood loading regimes were present, the floodplain below the campground would be active with side channels and other off-channel habitats. However, this is not the case and large wood recruitment in the Wind River has been limited by historic timber harvest to the river edge throughout most of the watershed. Constructing large wood complexes at the side channels below the campground infrastructure will provide a stop gap measure until future wood recruitment is available. Once the side channels are activated, energy from the river will be dissipated from a confined channel form to an anastomosing channel form and subsequent deposition of sediment and woody debris will occur between the side channel entrances and the side channel exit. This proposed project will increase deposition in the mainstem Wind in the project reach, improving the success of future floodplain restoration and berm removal upstream and adjacent to the campground.

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	Has a design alternative already been selected? It will be important to highlight the goals and objectives of the selected design alternative. Consider whether you are providing the LCFRB TAC and SRFB Review Panel enough information to assess and score this proposal.
	Reply: The Conceptual Design process (supported by SRFB grant #17-1078) identified multiple alternatives and worked with stakeholders to select a preferred alternative over a two year process. This current proposal requests funding to implement the selected alternative for the downstream portion of the larger area studied under 17-1078. Goals throughout the process were to find feasible actions to improve fish habitat and stream process while having to consider the location of the campground and Wind River Highway as being constraints. The beaver reach side-channel restoration portion of this reach was the most economical to implement, was the least impactful on the campground and the highway and gives the largest ecological lift that will create complex habitat for aquatic species.
General Comments	
	If funded, the LCFRB TAC requests that they review design materials prior to construction as a condition in the RCO contract.
	Reply: Yes, we would accept that condition.