Report to The Tributary Committees
October 12, 2017

PROJECT NAME: **Cottonwood Bridge Removal**
PROJECT NUMBER: **2017-01 RR**
SPONSOR NAME: **Chelan-Douglas Land Trust**
LANDOWNER NAMES: **CDLT, Crone, Deskin**

Project Summary

The project removed all of the steel superstructure and ~200 creosoted railroad ties. Additional work is currently underway, which was never part of nor funded by 2017-01 RR, to stabilize and partially remove the severely failing abutment, and will be finished in a few days. Thereafter we will continue planning for a large-scale habitat restoration project which our partners anticipate implementing in the next two years. That work will include complete removal of both abutments and associated fill, the addition of engineered log jams to the main channel, and numerous off-channel habitat improvements on the broad floodplain located on the far side of the river all of which is owned by CDLT.

2011 BOR Cottonwood Bridge aerial photo approximately ~Q2 discharge

Photo taken Sept 6 from far side of river

Challenges

1. There were many associated permitting issues associated with doing some the work "now" versus doing it all together later. Proposing to remove the steel and wood superstructure, by working from above and keeping out of the river, keeping out of the wetlands, etc, focusing on these limited elements allowed us to get permission from the regulatory agencies we needed to do the work this summer soon enough to begin work while flow was still low enough that the contractors could operate safely (ie- before the bridge got even worse).
2. After consultation with the man who built the bridge, it was determined that the most cost effective way to remove the superstructure would be to take it apart in the reverse order from which it was built. Begin on the far side and work backwards to a) remove ~200 RR ties one section at a time; b) remove ~25 steel cross beams one section at a time; c) remove the 2 main beams in the last step. As for the failing abutment on river, left it appeared to be stable enough to allow superstructure removal and remain in place until the large habitat restoration project. There were no design drawings (the bridge was never formally approved or permitted) to confirm the extent of the "heel" on the abutment footing or how the weight of the fill near the abutment affected its stability. To keep our project costs down and to complete the work before the weather and flow conditions changed, we made a reasonable plan to complete the job by the end of September.
3. The primary contractor with whom we worked successfully on the Enlow house removal contracted with Columbia Crane. They have the only crane in the area large enough

to handle the beams. The machine is very expensive and takes a long time to set-up, move, etc. It also requires site prep and other planning to ensure it can operate with an adequate safety factor, otherwise the crane operator will not begin the lift. In order for the crane to operate a portion of the road fill near the abutment had to be removed to create a level, compacted pad. Because of the weight of the beams this this had to be close to the abutment.

4. After all this was done and the crane was in place, the evening before it was set to remove the beams, the left abutment moved abruptly, tilting about 2' towards the river. Luckily no harm was done. Rather than begin the lift the next day, the crane operator required additional analysis, causing the primary contractor to hire an engineer to assess the situation from a crane safety perspective, leading to several steps of additional preparation including cable anchors on the landward side of the abutment, and about a week of extra crane rental time. The crane first had to move out of the way, then it moved back and successfully completed the job.

5. The condition of the left abutment presented a real possibility of falling into the river exposing a large amount of erosive material behind it to seasonal high flows. Working together with WDFW we determined the best thing to do is remove most of the abutment above the OHW line and stabilize the exposed dirt behind it. This will address the immediate concerns in a cost-effective and permit-compliant manner, leaving the non-emergency aspects to be completed during the large habitat restoration project.

Photo taken September 19 looking upstream the morning after the abutment shifted

<u>Suggestions to the Committee</u>

None

Final Work Products
n/a

Photo taken September 26 looking downstream towards former bridge location