

USING ELWd IN REDMOND'S WILLOWS CREEK PROJECT

The City of Redmond installed multiple Engineered Large Woody debris (ELWd) structures on an instream habitat restoration project in 2010. Prior to the project, the 800-ft stream reach lacked instream large woody debris and significant pools, there was high sediment and bedload transport, and had incising channels and eroding banks. ELWd structures were chosen for the project site because of the remote location and sensitive terrain, the ability to move the individual logs of the ELWd structures to the site with low-impact techniques, and the large size of the ELWd structures once reassembled instream.

ELWd provides a versatile alternative to large wood when working in sensitive and remote locations. The project site, on upper Willows Creek, is located in a steep ravine, and is difficult to reach with standard construction equipment, like tracked excavators. The individual logs were instead, transported from the top of the ravine to the stream channel, using a griphoist and cable system. Once the logs were at the stream, they were maneuvered into place by hand or by using simple tools, like peaveys, and timber carriers.



Cable system using straps, blocks & shackles



Logs transported on cable system from top of ravine, down to the stream

Anchoring of the ELWd relied on the diameter and length of the assembled structure to prevent it from mobilizing and moving downstream. The ELWd structures were sized to be 2-3 times the bankfull width of the stream, and the structure diameter greater than or equal to the bank full depth. The size of the assembled ELWd structures mimicked key pieces, allowing additional logs to be racked and built off them. Branches and smaller diameter logs were added to each ELWd to increase the habitat value.

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The inside of the ELWd structures were lined with a coir fabric and filled with cobble and gravel on the bottom, and soil on the top, and then planted with native vegetation. The riparian was also planted with native trees and shrubs to help stabilize eroding streambanks, restore the forest to pre-logged condition and to provide future large woody debris to the stream.

During recent fall storm flows, the ELWd and other log structures help aggrade the channel by slowing the stream velocity and holding sediment upstream of the structures. The addition of woody material also helped to scour pools, sort sediment and protect streambanks from erosive flows. Pre-project channel cross-sections, observed fish-use and photo points provide a base-line to compare future conditions and measure the long term success of the project.

For more information about this project, or about other stream issues, please contact Tom Hardy at twhardy@redmond.gov , or (425) 556-2762.



ELWd #1 being assembled by WCC crew



ELWd #1 during Willows Creek storm flow



ELWd #2 being assembled by WCC crew



ELWd #2 during Willows Creek storm flow