
	Section 404 Permit Application		 DAVID EVANS AND ASSOCIATES INC.
	Document Number: J1-000-RGL-PMT-DEA-00002-00		
	Rev.: B	Rev. Date: October 13, 2017	

Attachment F: Large Woody Debris Plan

Large Woody Debris Plan

In consultation with landowners, PCGP would place LWD at appropriate areas in the riparian zone and in the waterbody within the construction right-of-way to mitigate for potential short-term impacts that may occur to aquatic species from a dry open cut crossing and instream construction. LWD placement would occur after the pipe has been installed across the waterbody, during ODFW instream construction windows and during the time when the flume or dam and pump controls are in place to minimize turbidity associated with the installation of the LWD. Other possibilities include placing LWD immediately downstream from the lower flume dam (to create a depositional rather than potential scouring environment at the pipeline crossing) either during or after the flume has been removed. LWD could be placed across a stream channel with minimal or no generation of sediment after construction, as well. Such decisions will be made on a site-by-site basis. Installation of the LWD without the flume or dam and pump control measures in place would only occur with the approval of the appropriate permitting agencies.

The LWD quantities provided in Table 1 and Table 2 represent PCGP's restoration, enhancement and compensatory mitigation commitment for the project's potential waterbody crossing impacts. During construction, LWD will be installed at each waterbody crossing based on the site-specific waterbody crossing conditions, landowner requirements and potential construction constraints. PCGP would target LWD installation at each waterbody crossing according to the following schedule:

- 4 pieces for each perennial stream crossed with riparian forest removed (2 pieces instream, 2 pieces within riparian zone on the bank);
- 2 pieces for each intermittent stream and unknown stream crossed with riparian forest removed (one or both pieces placed instream or on bank);
- 2 pieces for each perennial, intermittent, and unknown stream crossed but with no riparian forest removed (one or both pieces placed instream or on bank).
- 1 piece each for perennial, intermittent, and unknown stream not crossed but adjacent to ROW with or without riparian forest removed (placed on bank).

Baseline watershed conditions crossed by the project are lacking in LWD from historic disturbance and are typically below benchmark thresholds to be properly functioning. LWD is an important habitat feature providing instream structure, channel and habitat complexity among other benefits and that which promote salmonid productivity. Therefore, PCGP considers installing LWD on site during construction as an appropriate habitat enhancement feature to rectify potential project impacts and which would benefit watershed conditions which are generally lacking. The LWD placement would be in addition to the project conservation measures that have been designed to minimize the potential project effects, such as utilizing dry open cut crossing methods, applying instream construction timing restrictions, and implementing erosion control measures and revegetation methods. Because of the overall lack of LWD in the affected watersheds, LWD also provides an appropriate compensatory mitigation model for the project's potential waterbody crossing impacts that are temporary, short-term, and unavoidable. The LWD would also serve to mitigate for the minor potential long-term project impacts, such as the loss of forested riparian vegetation within the pipeline's 30-foot operational corridor.

PCGP anticipates that during construction, in some cases, the waterbody size, landowner restrictions, or construction constraints will limit LWD placement according to the targeted LWD schedule provided in Table 1 and Table 2. Further, the overall benefit of installation of LWD at some project waterbody crossings (i.e., intermittent headwater streams) may not warrant LWD

placement. In these situations, PCGP's Environmental Inspector would record the uninstalled LWD as a deficit during construction. After construction is completed, the deficit or undersupplied LWD would be used as the compensatory LWD credit that would be provided to local watershed conservation organizations or agencies for use in local enhancement projects within the affected watersheds. The LWD credits could be either LWD donations or funds. In watersheds where there is a deficit of LWD installation during construction, PCGP would provide LWD with a minimum diameter of 10 inches and an average length of 20 feet. At least half of the LWD would be provided with attached root wads. Alternatively, PCGP would provide in-lieu funds equivalent to \$800 for each piece of LWD, which the watershed organizations could utilize to purchase LWD or implement enhancement projects

Table 1
Proposed Application of Large Woody Debris to Waterbodies and Riparian Zones Affected by
Construction of the Proposed Action within the Range of Oregon Coast Coho Salmon

Fifth Field Watershed	Watershed Parameter ¹	Waterbody Type						Total in Watershed	Pieces of LWD Applied to Fifth Field Watershed ¹		
		Perennial		Intermittent		Unknown			Crossed	Adjacent	Total
		Crossed	Adjacent	Crossed	Adjacent	Crossed	Adjacent				
Coos Bay-Frontal Pacific Ocean (HU 1710030403)	Area (acres) of Riparian Forest	2.79	0.06	0.88	0	0	0	3.73			
	Total Number of Waterbodies	4	2	10	5	0	0	21			
	With Riparian Forest	4	1	6	0	0	0	11	28	1	29
	No Riparian Forest	0	1	4	5	0	0	10	8	6	14
North Fork Coquille River (HU 1710030504)	Area (acres) of Riparian Forest	1.39	0	1.18	2.95	0	0.03	5.55			
	Total Number of Waterbodies	8	1	6	15	0	1	31			
	With Riparian Forest	3	0	6	6	0	1	16	24	7	31
	No Riparian Forest	5	1	0	9	0	0	15	10	10	20
East Fork Coquille River (HU 1710030503)	Area (acres) of Riparian Forest	4.99	0.08	4.34	1.4	0	0	10.81			
	Total Number of Waterbodies	8	1	8	3	0	0	20			
	With Riparian Forest	7	1	6	1	0	0	15	40	2	42
	No Riparian Forest	1	0	2	2	0	0	5	6	2	8
Middle Fork Coquille River (HU 1710030501)	Area (acres) of Riparian Forest	1.06	3.05	0	3.91	0	0.9	8.92			
	Total Number of Waterbodies	7	4	9	10	0	2	32			
	With Riparian Forest	1	3	1	6	0	2	13	6	11	17
	No Riparian Forest	6	1	8	4	0	0	19	28	5	33
Olalla Creek- Lookingglass Creek (HU 1710030212)	Area (acres) of Riparian Forest	2.79	0.06	2.12	0.18	0	0	5.15			
	Total Number of Waterbodies	4	2	10	5	0	0	21			
	With Riparian Forest	4	1	8	1	0	0	14	32	2	34
	No Riparian Forest	0	1	2	4	0	0	7	4	5	9
Clark Branch-South Umpqua River (HU 1710030211)	Area (acres) of Riparian Forest	2.83	0	1.18	2.95	0	0.03	6.99			
	Total Number of Waterbodies	8	1	6	15	0	1	31			
	With Riparian Forest	4	0	6	6	0	1	17	28	7	35
	No Riparian Forest	4	1	0	9	0	0	14	8	10	18

Fifth Field Watershed	Watershed Parameter ¹	Waterbody Type						Total in Watershed	Pieces of LWD Applied to Fifth Field Watershed ¹		
		Perennial		Intermittent		Unknown			Crossed	Adjacent	Total
		Crossed	Adjacent	Crossed	Adjacent	Crossed	Adjacent				
Myrtle Creek (HU 1710030210)	Area (acres) of Riparian Forest	5.21	0.08	4.34	1.4	0	0	11.03			
	Total Number of Waterbodies	8	1	8	3	0	0	20			
	With Riparian Forest	7	1	6	1	0	0	15	40	2	42
	No Riparian Forest	1	0	2	2	0	0	5	6	2	8
Days Creek-South Umpqua River (HU 1710030205)	Area (acres) of Riparian Forest	1.06	3.05	0.6	6.54	0	0.9	12.15			
	Total Number of Waterbodies	7	4	9	9	0	2	31			
	With Riparian Forest	1	3	1	7	0	2	14	6	12	18
	No Riparian Forest	6	1	8	2	0	0	17	28	3	31
Upper Cow Creek (HU 1710030206)	Area (acres) of Riparian Forest	0	0.13	1.57	0	1.04	0.16	2.90			
	Total Number of Waterbodies	3	2	2	0	1	1	9			
	With Riparian Forest	0	1	2	0	1	1	5	6	2	8
	No Riparian Forest	3	1	0	0	0	0	4	6	1	7
Total Fifth Field Watersheds For Oregon Coast Coho	Area (acres) of Riparian Forest	19.29	3.57	13.99	19.11	1.17	3.26	60.39			
	Total Number of Waterbodies	62	65	65	138	4	6	340			
	With Riparian Forest	31	9	34	35	2	6	117	196	50	246
	No Riparian Forest	31	56	31	103	2	0	223	128	159	287
							Total LWD		324	209	533

¹ Riparian Forest assumed to be coniferous, deciduous, or mixed forest 40 years old and older.

² Proposed schedule for applying LWD to different waterbody types, subject to landowner approval:

- 4 pieces for each perennial stream crossed with riparian forest removed (2 pieces instream, 2 pieces within riparian zone on the bank);
- 2 pieces for each intermittent stream and unknown stream crossed with riparian forest removed (one or both pieces placed instream or on bank);
- 2 pieces for each perennial, intermittent, and unknown stream crossed but with no riparian forest removed (one or both pieces placed instream or on bank).
- 1 piece each for perennial, intermittent, and unknown stream not crossed but adjacent to ROW with or without riparian forest removed (piece placed on bank).

Table 2
Proposed Application of Large Woody Debris to Waterbodies and Riparian Zones Affected by
Construction of the Proposed Action within the Range of Southern Oregon/Northern California Coast Coho Salmon

Fifth Field Watershed	Watershed Parameter ¹	Waterbody Type						Total in Watershed	Pieces of LWD Applied to Fifth Field Watershed ²		
		Perennial		Intermittent		Unknown			Crossed	Adjacent	Total
		Crossed	Adjacent	Crossed	Adjacent	Crossed	Adjacent				
Trail Creek (HUC 1710030706)	Area (acres) of Riparian Forest	0.76	0	1.47	2.11	0	0	4.34			
	Total Number of Waterbodies	2	0	4	3	0	0	9			
	With Riparian Forest	2	0	2	2	0	0	6	12	2	14
	No Riparian Forest	0	0	2	1	0	0	3	4	1	5
Shady Cove-Rogue River (HUC 1710030707)	Area (acres) of Riparian Forest	0.9	0	2.08	1.35	0	0	4.33			
	Total Number of Waterbodies	4	0	6	13	0	0	23			
	With Riparian Forest	3	0	5	4	0	0	12	22	4	26
	No Riparian Forest	1	0	1	9	0	0	11	4	9	13
Big Butte Creek (HUC 1710030704)	Area (acres) of Riparian Forest	2.37	0	0.78	1.05	0	0	4.20			
	Total Number of Waterbodies	3	0	5	7	0	0	15			
	With Riparian Forest	2	0	5	2	0	0	9	18	2	20
	No Riparian Forest	1	0	0	5	0	0	6	2	5	7
Little Butte Creek (HUC 1710030708)	Area (acres) of Riparian Forest	0.52	0.85	6.47	1.8	0	0	9.64			
	Total Number of Waterbodies	7	1	44	10	0	0	62			
	With Riparian Forest	1	1	16	4	0	0	22	36	5	41
	No Riparian Forest	6	0	28	6	0	0	40	68	6	74
Total Fifth Field Watersheds For SO/NCC Coho	Area (acres) of Riparian Forest	4.55	0.85	10.80	6.31	0	0	22.51			
	Total Number of Waterbodies	16	1	59	33	0	0	109			
	With Riparian Forest	8	1	28	12	0	0	49	88	13	101
	No Riparian Forest	8	0	31	21	0	0	60	78	21	99
Total LWD									166	34	200

¹ Riparian Forest assumed to be coniferous, deciduous, or mixed forest 40 years old and older.

² Proposed schedule for applying LWD to different waterbody types, subject to landowner approval:

- 4 pieces for each perennial stream crossed with riparian forest removed (2 pieces instream, 2 pieces within riparian zone on the bank);
- 2 pieces for each intermittent stream and unknown stream crossed with riparian forest removed (one or both pieces placed instream or on bank);
- 2 pieces for each perennial, intermittent, and unknown stream crossed but with no riparian forest removed (one or both pieces placed instream or on bank).
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