MEMORANDUM

OREGON DEPARTMENT OF FISH AND WILDLIFE

DATE: November 15, 2017

TO: Pete Baki – ODFW/ODOT Fish Passage Liaison

FROM: Eric Himmelreich, Umpqua Watershed Habitat Restoration Biologist

SUBJECT: Benefit Analysis for South Umpqua River Tributary, ODOT I-5 Roberts Mountain Fish Passage Exemption Request

The Oregon Department of Transportation (ODOT) seeks a fish passage exemption for an existing barrier culvert on an unnamed tributary to the South Umpqua River. The culvert currently completely blocks passage of native migratory fish to approximately 900 feet of poor-quality fish habitat. The barrier is located under I-5 at mile post 115.95 on Roberts Mountain Pass in Douglas County, near Winston, Oregon. ODOT proposes to widen 1-5 in order to add one northbound climbing lane and improve safety in the corridor. Widening the road and extending the culvert is a trigger for Oregon's Fish Passage Approval process.

The small, unnamed tributary originates in the hills east of the highway, flows west through the 450-foot-long, 4-foot-diameter corrugated metal culvert, and exits 134 feet beneath the surface of the road fill (See map, Figure 1). The stream then follows along the western edge of the road fill 0.4 miles before entering private property, and then flows 1 mile through agricultural land to the South Fork Umpqua River. The existing culvert, at 28% slope and with a 4-foot high outfall drop, is a complete barrier to fish passage (Figure 2). Construction of the new lane would require lengthening the existing culvert 50 feet, widening the road fill to the west, and relocating 800 feet of the downstream channel west of its current location.

In conjunction with the unfavorable channel characteristics upstream of the crossing, providing passage at this location will not provide an appreciable benefit to native migratory fish.

Basin/Channel Characteristics

The unnamed tributary is a small perennial creek with a 5 to 10-foot active channel width, low to moderate slopes in the lower portion of the drainage, and very steep slopes upstream of the highway crossing.

Original construction of the highway included importing a high amount of fill into the historic channel and floodplain, shifting the stream to the western edge of its valley, and completely blocking fish passage through the culvert into the upstream drainage. These changes in

topography make it difficult to determine the historic alignment, gradient and upstream extent of fish habitat in this basin. The slope between the inlet and outlet of the existing culvert is 28%. Based on LIDAR data of the surrounding topography and channel form, this channel was historically very steep, and it is unlikely the slope was less than 6% through this reach prior to installation of the roadway fill. This steep reach, which would have provided access only to the much steeper channel upstream, likely did not provide high quality fish habitat. Also, because of the steep slope of this reach, in present time it would be impractical to re-align the stream into an alignment that would provide fish passage and not negatively impact a much longer reach of fish habitat downstream of the crossing.

Immediately upstream of the crossing through the ODOT right of way 900 feet to the end of fish habitat, the stream cuts through a large deposit of streambed sediment impeded by the undersized culvert from transport downstream. (Figure 3). This reach of stream is prone to disturbance on a regular basis, as there is evidence of large episodic inputs of sediment, very little established vegetation (herbaceous or otherwise), and a shifting channel alignment, resulting in very poor fish habitat.

Fish Presence and Habitat

There are no records of historic or present fish use in this tributary. No known surveys have been completed for fish use in this stream, and the stream is not categorized as having documented or presumed fish presence on ODFW fish distribution maps. However, due to mild stream gradients and perennial flows downstream of the crossing, we presume that species likely to access the lower reaches of this tributary include Coho salmon, steelhead, lamprey, and cutthroat trout.

Oregon Department of Forestry (ODF) has modeled potential fish habitat based on gradient and basin area in many stream basins throughout Oregon. Based on this model, ODF fish presence maps show potential fish habitat extends to 0.8 miles upstream from the outlet of the culvert. However, during a field visit in early May 2017, ODFW staff observed that although the stream has a low-gradient channel for the first 900 feet upstream of the highway crossing through the ODOT right of way, upstream of the highway corridor it has a very steep, scoured, step-pool channel at approximately 15% slope (Figures 4, 5). Based on LIDAR observations, the channel continues at that gradient for approximately 0.3 miles, flattens out to approximately 7% for another 0.1 mile, and then increases to approximately 12% to the ODF-modeled end of fish habitat. Flows have been observed near the highway crossing in late summer, although in May 2017 (a very wet spring), there was only approximately 1 cfs of flow near the crossing location. Based on the steep gradients and small amount of stream flow, ODFW determined that potential fish habitat ends approximately 900 feet upstream of inlet of the I-5 crossing.

The crossing is located 1.4 miles upstream of the tributary's confluence with the South Umpqua River. Although historically there was likely abundant fish use downstream of the crossing, the stream currently does not provide high quality spawning or rearing habitat. From the project site downstream, the natural stream channel has been greatly altered from its original alignment, and watershed processes have been disrupted limiting habitat quality downstream of the culvert. In the first 0.4 miles downstream of the crossing, the stream is channelized along the edge of the road fill, with a gradient ranging from 3 to 5% and a moderately intact riparian area (Figures 6, 7). The stream then flows through two partial-barrier culverts and a large ranch. This lower portion of the stream has been highly modified and currently has an incised channel, no over

story vegetation, and is dominated with non-native blackberries (Figures 8, 9). Although the stream is perennial in the upper reaches, according to the ranch manager, it is known to go dry during the late summer through sections of this reach. This section of stream may be used by native migratory fish, but the habitat quality likely limits the amount of fish use in this basin.

Project Benefit Analysis and Conclusion

The ODFW Umpqua Watershed District recommends granting an exemption at this ODOT culvert. Human impacts and partial fish passage barriers downstream of the crossing limit habitat quality for native migratory fish up to the crossing location. Due to the unstable nature of the stream channel and the degraded habitat conditions in the 900 feet of potential fish habitat upstream of the crossing, the Umpqua Watershed District concludes there are no appreciable benefits to native migratory fish if passage were provided at this site. If the conditions from which this determination is made change in the future, ODFW Umpqua Watershed District recommends that the exemption be revoked.

cc:
Julie Worsley, Oregon Department of Transportation
Greg Huchko, ODFW Umpqua District Fish Biologist
Jason Brandt, ODFW Umpqua Assistant District Fish Biologist
Greg Apke, ODFW Statewide Fish Passage Coordinator
Project File (E-16-0009)

ODOT I-5 Crossing over South Umpqua Tributary

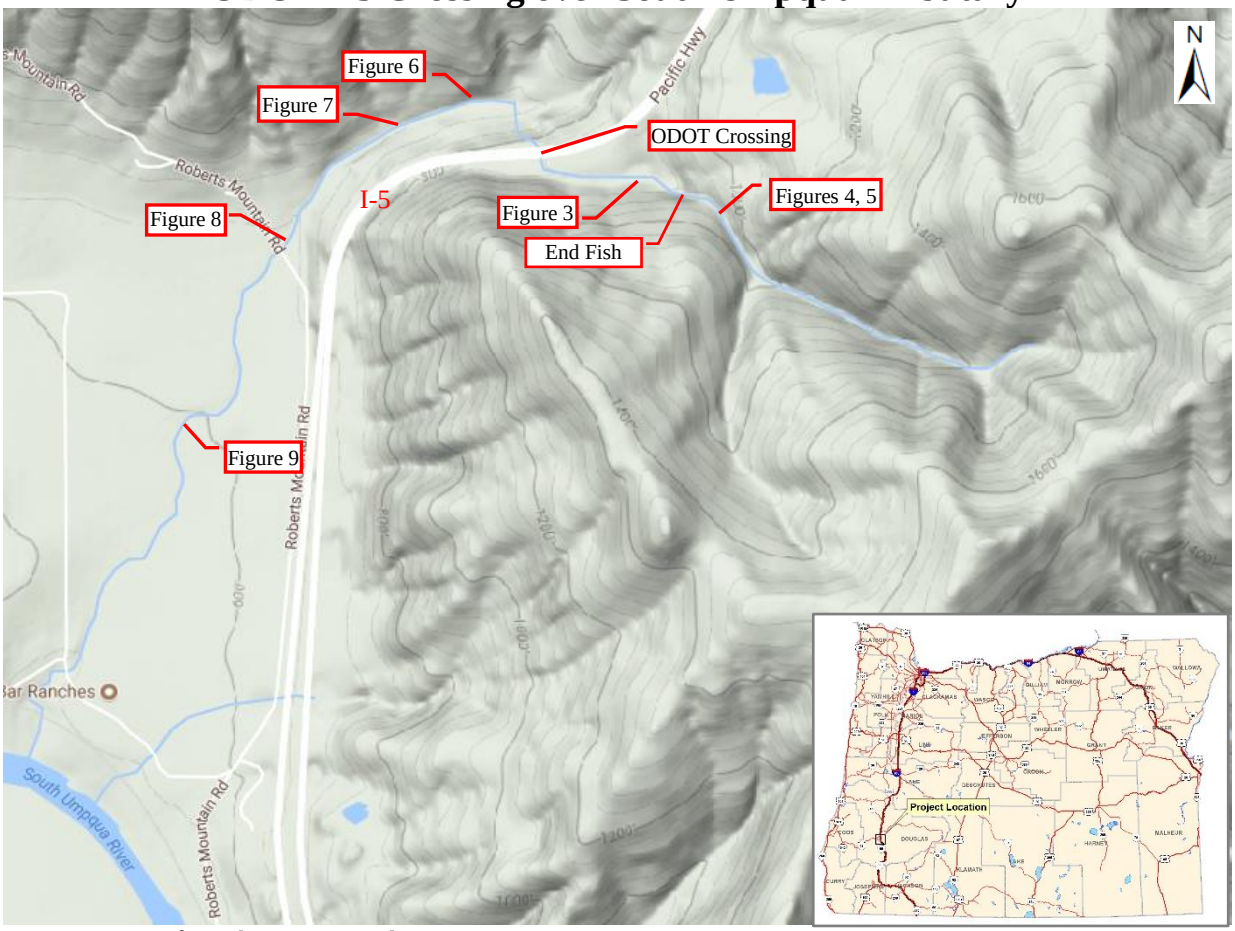

Figure 1. Map of South Umpqua Tributary.


Figure 2. ODOT barrier culvert outlet at I-5 MP 115.95. (May 2017)

Upstream of Crossing

Figure 3. Upstream of the crossing in the ODOT right of way. (May 2017)

Figure 4. Steep channel upstream of ODOT right of way. (May 2017)


Figure 5. Steep channel upstream of ODOT right of way. (May 2017)

Downstream of Crossing


Figure 6. Downstream of the ODOT crossing within the ODOT right of way (this portion of the channel would be relocated to the west (left)). (May 2017)

Figure 7. Downstream of the ODOT crossing as it enters private property. (May 2017)

Figure 8. Upstream of Roberts Mountain Road partial barrier culvert. (May 2017)

Figure 9. Stream flowing through the ranch near its confluence with South Umpqua River. (May 2017)