



Fremont-Winema National Forest

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Roads Analysis Report Forest-Wide Assessment

Winema Portion of the Fremont-Winema National Forests
December 2006

Issue 4: Fish Passage and Road Crossings

It is a National and Regional requirement to evaluate fish passage at road crossings on all fish bearing streams. Evaluation of Fish Passage at Road Crossings is an interdisciplinary effort initiated by Engineering, Hydrology, and Fisheries to identify high priority fish passage sites and determine the total need for funding to improve fish passage throughout the Region. To accomplish this, the Forest completed a culvert inventory analysis. Culvert data was collected using an established procedure; data was reviewed and input into a Regional database. The final report included total number of sites; percent of culverts that do not meet fish passage criteria; total miles of habitat blocked, summarized by species; and top Forest priorities for fish passage restoration.

Key elements of this analysis are to:

1. Identify culverts that are barriers or partial barriers to fish movement.
2. Determine the adequacy of existing culverts and make recommendations for future upgrades or modifications to provide for fish passage.
3. Meet National and Regional direction to identify and resolve fish passage problems.

Background

In order to determine how and where roads affect fish passage, streams which support fish needed to be determined. Stream surveys, electrofishing and snorkeling data were compiled. This data was used to develop event tables to produce GIS maps showing fish species and distribution at the 6 th field Hydrologic Unit Code (HUC). The event tables can be updated as necessary.

The initial GIS query for number of road crossings on fish bearing streams provided 109 crossing points. This number included crossings that were really points *close* to the stream (i.e. water chance), crossings that included bridges, crossings on roads that have been obliterated, and crossings on private property or County, State and Federal Highways. All crossing points on fish bearing streams were visited to verify type. Bridges and fords were documented and photographed. All culverts encountered on roads maintained by the Winema National Forest on fish bearing streams were inventoried.

The culverts were inventoried following Region 6 instructions provided in the **Appendix (Exhibit 4-1)**, *“Fish Passage Through Road Crossings Assessment Form”*. A matrix in the **Appendix (Table 4-1)** was used in the field to rate whether or not the culvert met the criteria to allow fish passage. The matrix color-coded the passage criteria:

GREEN culverts are assumed to be adequate for fish passage.

RED culverts do **not** meet the criteria to allow fish passage.

GREY culverts require additional analysis to determine fish passage.

Results

The Fish Passage at Road Crossings Assessment Project on the Winema National Forest evaluated 39 culverts at 28 locations on fish bearing streams. Of the 39 individual culverts, 28 do not meet the criteria to allow fish passage (RED). There are 11 culverts that rated GREY. None of the culverts surveyed on the Winema National Forest rate as GREEN. The following tables describe how the culverts inventoried on the Winema National Forest rated, based on type of culvert and reason for RED designation.

Culvert Type By Fish Passage Criteria

Culvert Type	GREEN	GREY	RED	Total

Circular				
< 48" diameter	~	~	17	17
> 48" diameter	~	3	3	6
Box	~	~	~	0
Open Bottom Arch	~	~	~	0
Pipe Arch (squashed)				
< 58" span	~	5	3	8
> 58" span	~	3	5	8
Total	0	11	28	39

Type and Size	Gradient	Perch	Bankfull	# GREY	Total
Circular culvert					
< 48" diameter	14 at > 1% grade	3 with > 4" perch and low BF ratio		0	17
> 48" diameter	2 at > 2% grade	1 with > 4" perch		3	6
Pipe Arch (squashed)					
< 58" span	3 at > 1 % grade			5	8
> 58" span	2 at > 2 % grade	3 with > 4" perch		3	8
Total	21	7		11	39

Culverts

with "RED" Rating Due to Gradient, Perch and Bankfull

Recommendations

Culverts were prioritized for improvements/repairs by evaluating the status of the fish that reside in the stream. Streams with endangered fish species ranked high, followed by listed sensitive species, other native species and introduced species. Once the streams were divided into fish species groupings, we prioritized by the following criteria:

1. Management direction outlined in the Forest Plan or other Plans.
2. Potential for stream to provide habitat to native species from adjacent streams if current barriers were removed or renovated.
3. Stocked fish from lakes could utilize stream habitat with adequate culvert passage.
4. Culvert is in poor condition.
5. Stream has perennial flow at culvert location.

In the Appendix Exhibit 4-2 explains rationale for culvert replacement/repair prioritization.

In the Appendix Exhibit 4-3 provides cost estimates for recommended improvements.

Recommendation for Top 5 culverts:

1. North Fork Trout Creek (Tag #3, Road 5850-000). This culvert should be replaced with an open bottom structure as stated in the Winema National Forest Plan. This culvert rated as "RED". Culvert slope is 3.2% with a jumping height of 1.1 ft. Although it flows less than 2 miles, this stream provides good quality habitat for sensitive redband trout. Trout Creek flows through Management Area 4.

2. South Fork Trout Creek ford at 5850-000 crossing. Since this crossing is in Management Area 4, an open bottom structure should be considered. This crossing was not evaluated as part of the inventory. South Fork Trout Creek is often dry at this location by late summer. During spring run off, if redband trout move upstream out of Trout Creek or the Sprague River, they must negotiate this ford. The ford is wide and shallow.

3. Threemile Creek (Tag# 17 & 18, Road 3449-000). These two culverts are upstream of threatened bull trout occupied habitat. Water is present only during spring run-off. These culverts do not need to provide passage for fish but this area is a serious source of sediment into the stream.

4. Jack Creek (Tag #10, Road 9481-000). Jack Creek has a relatively short section of stream that maintains perennial flow. Any fish that pass downstream through the culvert need to be able to return upstream as flows diminish during the summer. Although this culvert rated “RED”, it has a slope of only 0.3%. The jumping height as measured between the pool tail crest and the lip of the culvert is about 7inches, although the outlet is submerged. Directly downstream of the culvert is a water chance. Need to review whether modifying the water chance would improve fish passage through culvert.

5. Middle Fork Trout Creek (Tag #2, Road 2228-250). This road is closed. The stream drains a seasonal meadow. REMOVE CULVERT.

Additional Recommendations

Jack Creek (Tag#11, Road 8821-000). This crossing suffered from severe erosion during summer 2001 thunderstorms. Native surface material (pumice) was transported down the road and into the channel. The fill around the culverts has washed out.

Deep Creek ditch (Tag #5, Road 4648-000). Although this channel is an irrigation ditch, it provides good quality habitat for introduced brook trout. This crossing has two side by side culverts that are different diameters. One of the culverts is damaged. A single larger pipe or arch would provide improved fish passage, as long as fish passage criteria were met.

Seldom Creek (Tag#28, Road 3704-000). Three very rusted pipes drain a seasonal meadow. Multiple culverts receive a “GREY” rating. The current slope and jumping height allow fish passage, but the bankfull ratio is low. This crossing may need larger or additional pipes, something suited for meadow crossings.

Spencer Creek, ford downstream of Buck Lake. This crossing was not evaluated with the inventory. The road has been closed for a number of years, but cattle and four-wheelers cross at the ford. Raw, unstable

banks at this crossing allow fine sediments to enter the stream. This ford needs to be hardened and the banks re-vegetated and protected from grazing.

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