

Chehalis Resurvey Culvert Assessment

Water Resource Inventory Area 23



Lewis County Conservation District

Final Report

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Introduction

Major flooding events occurred in December 2007 and January 2009. Due to the massive volumes of water and debris, the possibility of damage to culverts could be an issue for fish passage. One of the hardest hit areas was the South Fork Chehalis River which had last been surveyed in 2003. Other areas that were included in this survey were Bunker Creek and the Upper Chehalis basin. This project was funded by a grant from the Washington State Salmon Recovery Funding Board and the Chehalis Fisheries Restoration Program of the United States Fish and Wildlife Service.

Scope

Previous surveys completed by the Lewis County Conservation District were used as references for the location of culverts. Updated information on culverts in forestland was obtained from the Department of Fish and Wildlife (WDFW) and the Department of Natural Resources (DNR). The final goal of the project was to produce a single map detailing all culverts in the target area whose barrier status had changed.

Survey Methods

Initial Landowner Contact

Initially, all landowners with a culvert in the targeted areas were sent a letter and then contacted in person. A few landowners declined to allow us to look at their culverts

as they felt the flood had not caused damage. Agencies were contacted via telephone or e-mail.

Level ‘A’ Analysis

Surveying the culverts was completed according to Washington Department of Fish & Wildlife (WDFW) protocol using the *Fish Passage Barrier Assessment and Prioritization Manual* of the Salmonid Screening, Habitat Enhancement, and Restoration (SSHEAR) Division (August 2000). The data was collected on the Site Identification Field Form and the Culvert Evaluation Field Form. Site location was established by the use of a handheld Garmin GPS unit. Culvert lengths and slopes were obtained using a transit with a reflector mounted on a survey pole. Other data was obtained using normal field practices.

Level ‘B’ Analysis

A level B survey analysis was conducted when level A analysis did not clearly distinguish barrier status. A Level B Analysis Elevations Worksheet was completed in the field. The WDFW protocol was used to perform a site evaluation. A transit was used in conjunction with a rod and reflector to complete cross sections and to determine culvert elevations. Due to culvert 1304W13B being backwards sloped, Dave Collins from WDFW analyzed the level B data.

Results

| Sub-basin | Impassable | Passable | Unknown | Totals |
|----------------------------|-------------------|-----------------|----------------|---------------|
| <i>Upper Chehalis</i> | 3 | 4 | 3 | 10 |
| <i>South Fork Chehalis</i> | 6 | 4 | 1 | 11 |
| <i>Bunker Creek</i> | 0 | 1 | 1 | 2 |
| <i>Chehalis River</i> | 2 | 1 | 0 | 3 |
| Totals | 11 | 10 | 5 | 26 |

When culverts are evaluated they fall into the categories of impassable, passable or unknown, based on the ability to pass a 6 inch trout. If a culvert is rated impassable it is not necessarily a total barrier to fish passage. It can be causing a delay or limiting a certain lifestage of the salmonid. A passable culvert allows the 6 inch fish to pass the culvert at all times. Unknown culverts were unable to have barrier status determined.

Chehalis Resurvey Basins

Sub Basins

Upper Chehalis

Debris torrents and large volumes of water altered the Upper Chehalis basin. Several bridges were destroyed but because they did not affect fish passage they are not detailed on the map. The majority of the basin was in forestland that we were unable to access for various reasons including roads and bridges being washed out. Information on these areas was gathered from RMAP data.

Most culverts had been influenced by the flooding. However, the barrier status had not changed. In some instances the culvert had completely washed out and was put back in as a barrier. Prior to the flood, culvert 1305W10A had bed material most of the way through. The stream had scoured down and no streambed was present in the 20.5 meter long culvert which had a slope of 1.3%.

Culvert 021(27820)(02631) was passable due to streambed being present. Passable culverts 1305W05A and 1305W05B were added to the database. In 2003 the landowner denied access but granted it in 2009.

Culvert 1304W13A was rated as passable in 2003 but was rated as unknown barrier status in 2009 due to being covered with logs. Upstream culvert 1304W13B had been washed out and was replaced with a culvert that was 67% passable. Overall, ten culverts were either added or had their barrier status altered.

South Fork Chehalis

The South Fork Chehalis basin was also affected by extremely high water and debris torrents. Information on forestland culverts was gathered from RMAP data. Barrier culverts on Barney Creek and Lentz Creek were replaced with bridges which were not affected by flooding.

Culvert 1303W32A had become a barrier due to no longer having streambed and having a slope of 1.8%. Culvert 021(24017)(08876), located on Barney Creek, had become passable due to having bed material. Local landowners attributed it to beaver activity backwatering the crossing.

Culvert 1304W36D was a passable culvert located on Beaver Creek that was not present during our last survey. Culvert 1304W35B was passable in 2003 but the stream had scoured down and no streambed was present. The plunge pool had been armored

creating an additional fish passage issue resulting in the crossing being rated as 33% passable.

Culvert 1204W03B was originally rated as 33% passable but it had deteriorated further giving it a rating of 0% passable. Culvert 1304W33A was originally rated as passable but stream had scoured down and no streambed was present inside the pipe. Since the culvert had less than 1% slope and a level B could not be completed it was rated as unknown barrier status. However, the culvert was most likely a barrier as the bottom was rusting out and there was barely any water inside. Upstream, culvert 021(25570)(00024) was passable in 2003 but in 2009 it was a complete barrier. The original culvert was filled up with riprap and a new culvert was set on top of it. Juvenile fish were observed trying to go through the original culvert but it was completely blocked. The next crossing upstream, 021(25401)(03620) was passable because it had streambed present.

Finally, culvert 1204W31C had been removed by the landowner. Overall, a total of eleven culverts were either added or had their barrier status altered. Additionally, two culverts were replaced with bridges.

Bunker Creek

Bunker Creek was affected by the flood but it did not alter the barrier status of any crossings. Culvert 1303W06C was a concrete box culvert that was overlooked during the original survey. It was rated as unknown barrier status due to being unable to complete a level B. It is most likely passable due to the depth of water inside the box culvert. The culvert at the end of Deep Creek Road had been replaced by a bridge. Information on culvert 1372 was obtained from RMAP data.

Chehalis River

Near the town of Chehalis, flooding had not affected crossings. However, culvert 021(924002)(01505) was replaced since 2003. A new bridge was also installed on Mill Creek. Barrier culverts 132081981 and 1403W26A, located on a tributary to Scheuber Ditch were overlooked in the original survey.

Conclusion

The Upper Chehalis basin and the South Fork Chehalis basin were both influenced by flooding. To a lesser extent Bunker Creek and the Chehalis River near Chehalis had been affected by flooding but it had not altered the barrier status of culverts. This survey illustrates the importance of updating culvert databases as the barrier status of crossings can change regardless of if they are affected by flooding.

References

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