

# **Lincoln and Scammon Creeks Watersheds Culvert Assessment**

Water Resource Inventory Area 23



Lewis County Conservation District

Final Report

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## **Introduction**

The Lincoln and Scammon Creek basins, which are located in Lewis County, Washington, WRIA 23, contain several streams of importance for anadromous fish. Culverts, if improperly installed or deteriorated over time, can prevent or limit the ability of adult and juvenile salmonids to access all habitats. Coho salmon, searun cutthroat, and steelhead travel up into the smaller streams and are therefore more likely to be impacted by blocking culverts. It is important that fish have access to all habitats to spawn, elude predators, find food, and escape high flows. However, a complete database that listed all the culverts in the system did not exist. Therefore, the Lewis County Conservation District undertook the task of finding and evaluating culverts. The data that was acquired was combined with existing information to make a complete map and database. This project was funded by a grant from the Washington State Salmon Recovery Funding Board. The maps and database should be viewed in conjunction with this report for total comprehension.

## **Scope**

The purpose of this survey was to identify all culverts on type 1-4 streams, in the Lincoln and Scammon Creek basins. This survey involved obtaining information from private landowners, timber companies, Lewis County Public Works, the Department of Natural Resources and the Washington State Department of Fish and Wildlife. The final goal of the project was to produce a map detailing all culverts as, passable, impassable or of unknown barrier status.

## **Survey Methods**

### ***Initial Landowner Contact***

Initially, streams typed 1-4 were identified in the Lincoln and Scammon Creek Basins. A list of landowners along these streams was generated using information from the Lewis County Assessor's office. All identified landowners were sent a letter explaining the survey and that district personnel would be contacting them at their residence. If a landowner was not at home an attempt was made at contacting them via telephone. Agencies were contacted via telephone or e-mail. In addition, research was conducted at the Washington State Archives to locate Hydraulic Permit Applications (HPA's) to further identify landowners that might have culverts.

### ***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 backpack mounted Trimble GPS receiver. Culvert length was determined with a tape measure. A transit was used in conjunction with a rod and reflector to determine slope. Additional data was obtained using normal field practices.

### ***Level 'B' Analysis***

A level B survey analysis was conducted when results 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. In the office, the Level B 2.3 Barrier Analysis spreadsheet was used to determine fish passage status.

### *Previously Surveyed Culverts*

Information on culverts underneath county roads was obtained from Lewis County Public Works. County culverts were surveyed using WDFW guidelines. The District re-surveyed some of the higher priority unknown barrier status county culverts to determine passability. WDFW provided information on Washington State Department of Transportation culverts and additional data on Lewis County road culverts. The Department of Natural Resources (DNR) gave us information on their culverts. Weyerhaeuser declined to allow the District to survey their culverts and they had not yet completed their Road Maintenance Abandonment Plan (RMAP) with the DNR. However, surveying on their lands was low priority as it was located in the headwaters of the Lincoln Creek basin.

### *Other Survey Methods*

Not all landowners replied to our request to survey their culverts. Aerial photos were viewed to determine locations of crossings. In areas where the stream could be seen from the road, windshield assessments were performed to detect the presence or absence of culverts. If culverts were observed the field forms were filled out with as much detail as possible. In addition, information was obtained from other local landowners. If we could not actually evaluate the culvert, it was listed as unknown barrier status. Overall, the majority of landowners allowed access to their properties for our survey.

### **Results**

<b>Sub-basin</b>	<b>Impassable</b>	<b>Passable</b>	<b>Unknown</b>	<b>Totals</b>
<i>Lincoln Creek</i>	20	35	3	<b>58</b>
<i>Scammon Creek</i>	10	7	1	<b>18</b>
<b>Totals</b>	<b>30</b>	<b>42</b>	<b>4</b>	<b>76</b>

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 life stage of the salmonid. A passable culvert allows a 6 inch fish to pass the culvert at all times. Unknown culverts were unable to have barrier status determined.

## **Lincoln and Scammon Creek Basins**

### *Basins*

#### *Lincoln Creek*

The confluence of Lincoln Creek with the Chehalis River was located near the community of Galvin. This low gradient stream flowed through agricultural lands with the headwaters originating in timberlands. Farmers who lived in the basin were aware of the importance of maintaining the health of the stream. Several farms had oxbows that were connected to the stream with a culvert. Most livestock were fenced out although the riparian buffer was generally narrow. The Lincoln Creek basin floods seasonally especially in the lower reaches. This fact contributed to the use of bridges as crossings on the mainstem. The main tributaries in this system were Eagle Creek, Sponenbergh Creek, Wildcat Creek, North Fork Lincoln Creek and South Fork Lincoln Creek.

Eagle Creek, which paralleled Mattson Road, had been impacted by past agricultural practices. Areas of the stream had been ditched. In the lower reaches a narrow buffer of deciduous trees was present. However, above this area most of the riparian cover had been removed with canary grass being the primary vegetation. Most of the farmland was being used for hay or vacant. The Department of Natural Resources (DNR) owned most of the land at the headwaters, which was a former farm. Trees were observed planted near the stream, but establishment of a buffer will be difficult due to reed canary grass. A longtime landowner stated he had not seen salmon in the stream for several years. Spawning gravel was present that could be utilized by fish. Three partial barrier culverts were present in the system. Culvert 1403W03A was located in timberlands and the landowners were planning on replacing it. Culvert 1403W04C was located on DNR land and will eventually be replaced. Also located on DNR land, barrier Culvert L1403W09E was only blocking an insignificant amount of habitat.

Sponenbergh Creek and its tributaries had eight barrier culverts. Two barrier culverts existed on the first unnamed tributary that branched to the east. Cattle had been fenced out of the stream and a riparian buffer had been planted. Both culverts were barriers to juveniles and resident fish at certain times of the year. Beaver activity was present in this area. The next east side tributary had two blocking culverts. Culvert 1503W31D, located underneath a private driveway, was rated as 67% passable. Almost two miles of habitat existed above this barrier. The stream flowed through agricultural lands in the lower reaches with the headwaters being in timberlands.

The mainstem of Sponenbergh had three blocking culverts along its length. The lowest blockage in the system, Culvert 1503W31C, was rated as 67% passable. Approximately two miles of habitat existed above this barrier. The lowest reaches of Sponenbergh Creek flowed through pastures and hay fields with no animal access. The riparian buffer was narrow and consisted of deciduous trees. The headwaters originated in timberlands.

Above barrier Culvert 1503W31A, a tributary to Sponenbergh Creek branched off to the South. Barrier culvert 021(11016)(00571) was blocking a small tributary underneath Teague Road.

Culverts were not impacting the North Fork of Lincoln Creek. Barrier culvert L1405W02B was blocking a small tributary but it was near the headwaters. Culvert 1404W05A was a juvenile barrier that was located on a field ditch that flowed to the North Fork. It was included in this survey due to coho being observed above this site. In the lower reaches of the North Fork cattle were not fenced out of the creek. An incised channel was limiting the cattle from entering the stream but the riparian cover was sparse. The proximity of the stream to the road would limit the planting of a buffer. The upper part of this stream was in forestland. Spot checks revealed that the North Fork of Lincoln Creek had excellent spawning gravel.

The South Fork of Lincoln Creek had seven barrier culverts on tributaries. Culverts 1405W12A and 1405W12B were the most significant barriers. Priority indexes were completed for both culverts and more information is included in the priority index section of this report. Barrier culvert 021(10019)(13330) existed underneath Lincoln Creek Road on an unnamed tributary to the South Fork. Three barrier culverts, the lowest being 1505W12A, existed in a row on another unnamed tributary that had no significant habitat for fish. The stream was ditched and flowed through a pasture.

Wildcat Creek was a major tributary to the South Fork. The stream flowed primarily through forestlands. Spot checks revealed good spawning gravel with little sediment. Culvert 021(10019)(13700) was an impassable barrier that would be severely limiting the production potential. However, some fish were passing as evidenced by juvenile coho observed upstream. A priority index was completed for this culvert and more information is included in the priority index section of this report.

Lincoln Creek also had several unnamed tributaries, none of which were highly significant for fish. Fourteen barrier culverts were present with the majority of them being on small streams that flowed underneath Lincoln Creek Road. The first north side tributary had two blocking culverts. The landowner where barrier culvert 1503W28A was located had an interest in conservation.

Culvert 1504W26A was located on a tributary that had been ditched to parallel Lincoln Creek Road. Spot checks revealed a mud bottom stream that was mainly pool habitat. The riparian cover consisted primarily of canary grass. However, a CREP buffer was planted along the stream in the vicinity of culvert 1504W35A. Culverts 021(10010)(00073) and 021(9105)(07483), were of unknown barrier status but they were not blocking significant habitat.

Culvert 021(91015)(09003) was of unknown barrier status due to a large beaver dam at the inlet. If the culvert was maintained it would likely be passable. On the same tributary barrier culvert 1404W04A was blocking an insignificant amount of habitat. The stream had been ditched for most of its length. The landowner where the culvert was located stated that in the past salmon had utilized the stream. However, an upstream landowner had ditched the stream and he no longer observed fish. The lower reaches of the stream would be important for rearing as beaver activity had created large swamps.

### *Scammon Creek*

Scammon Creek was primarily a silt bottom stream that flowed through residences and small farms in the lower reaches. Blocking culvert 021(91025)(01010) underneath Graf Road was the most significant barrier in the system due to sheet flow through the double box culvert. Nine blocking culverts existed above this site. Culvert 1403W10D, near the headwaters was of unknown barrier status due to being completely underwater. The first unnamed tributary had three blocking culverts in the lower reaches with culvert 1403W13A being lowest in the system. Spot checks revealed that the stream had a silt bottom. The riparian buffer was narrow in the lower reaches. The width was limited throughout by the close proximity on the west side to Graf Road.

Past the first unnamed tributary Scammon Creek flowed through an area of residences and small farms. The riparian area was poor with cattle accessing the stream in some areas. The stream was incised in this area and off channel rearing areas were limited.

The South Fork of Scammon Creek was a silt bottom stream with abundant beaver ponds. Blocking culvert 1403W13E was blocking over a mile of habitat.

The upper reaches flowed through timberlands where some rock was present in the stream. Juvenile coho were observed in the stream at approximately river mile three, near where a blocking culvert had been removed.

### **Priority Index**

The amount of culverts that need to be replaced or upgraded in Washington State will probably be enormous. Therefore, the SSHEAR priority index method was developed to determine the culverts that would most benefit fish by being replaced. The priority index takes into account the quantity and quality of the upstream habitat. It considers fish usage and the condition of the stock. The cost of replacement is also taken into consideration. Lewis County had previously completed one priority index in the Lincoln Creek basin.

#### ***Culvert 021(10019)(13700)***

#### ***Priority Index 15.87***

Lewis County Public Works hired a consulting firm to do a priority index on blocking culvert 021(10019)(13700). The information on this culvert can be found in the *Culvert Inventory and Assessment, Lewis County, Washington*.

#### ***Culvert 1405W12B***

#### ***Priority Index 9.12***

This culvert was located at river mile .39 on an unnamed tributary to South Fork Lincoln Creek. It was rated as 67% passable due to a slope greater than 1%. It was primarily a barrier to juveniles and resident fish. A total of 916.7 linear meters of stream was surveyed. A large portion of the stream was swamp which contributed to the 1377.23 square meters of rearing habitat. A total of 237.27 square meters of spawning habitat was present with the majority in the lower reaches. Numerous juvenile coho were observed in the lower reaches. The riparian area consisted primarily of deciduous trees and shrubs



with a few conifers present. Collapsed culvert 1405W12C was located at river mile .55. Water flowed through rocks and the crossing was completely impassable. Therefore both crossings would need to be fixed to gain the maximum benefit to the stream.

***Culvert 1405W12A***

***Priority Index 6.45***

This culvert was located at river mile .07 on an unnamed tributary to the South Fork Lincoln Creek. It was rated as 67% passable due to an average depth through the culvert as being less .3 meters. A total of 1283.8 linear meters of stream and one tributary were surveyed. The stream was most important for spawning with a total of 673.61 square meters present. Rearing habitat was limited with only 204.86 square meters present. Numerous juvenile coho and juveniles tentatively identified as steelhead were present in the lower reaches. Resident trout were also observed in the lower reaches. The riparian area consisted primarily of alder trees and deciduous shrubs. At 262 meters upstream on the tributary, culvert 1405W12D was a complete barrier. However, most of the valuable habitat was located below this point.

**Conclusion**

The culvert survey of the Lincoln and Scammon Creek watersheds revealed that 39.5% of the culverts were impassable. The most significant impassable culverts existed underneath public roads. The county and state are working on a long-range plan to fix impassable culverts. The timber companies are required by law to complete a road management plan that includes fixing barrier culverts by July 2016. A fair amount of blocking culverts existed on private land. The majority of landowners in this basin were cooperative and helpful. This will facilitate the District in going back into the basin to prioritize culvert replacements. In conclusion, culvert replacement projects in the Lincoln and Scammon Creek basins would open significant habitat for anadromous fish.

***References***

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