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Culvert Repair Programmatic Agreement Pilot Project Repair Sites

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OR99W MP 19.22 Cedar Creek Culvert Repair
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Attachment 1

Figure 1.  Culvert Repair Programmatic Agreement Pilot Project Geographic Range

Figure 2.  Culvert Repair Programmatic Pilot Project Repair Sites

Figure 3.  Locations of the Fish Passage Compensation Fund Sites
Background

The Oregon Department of Fish and Wildlife (ODFW) and the Oregon Department of Transportation (ODOT) approved a Culvert Repair Programmatic Agreement (CRPA) Pilot Project on October 10, 2014. The Agreement expired on December 31, 2017. This agreement allowed ODOT to make site-specific short-term repairs to aging culverts in a cost effective manner, while providing a net benefit to native migratory fish (NMF) over the status quo by improving fish passage at each site repaired. As part of the agreement, ODOT paid $1.8 million into an ODFW managed account that was used to fund high priority fish passage projects off the State highway system to offset delayed full criteria fish passage at the culvert repair sites. In this agreement, ODOT also provided funds for an ODFW/ODOT Fish Passage Liaison Position for the duration of the agreement. ODOT additionally dedicated $4.2 million per year to providing full fish passage at high priority fish passage sites on the Oregon highway system regardless of the condition of the infrastructure.

The CRPA allowed repairs to culverts that meet the following criteria:

1) Culverts must be located west of the Cascades and outside of the ODFW North Coast Watershed District (See Figure 1 in Attachment A),
2) Culvert repairs intended to provide (up to) an additional 25 years of culvert life,
3) Repaired culverts must include fish passage improvements, and
4) Culverts cannot be identified as a high priority for fish passage as determined by ODFW.

This report provides analysis on the effects of the pilot project on fish passage at the repair sites and at the fish passage improvements implemented through the $1.8 million fish passage funds provided by ODOT and administered by ODFW. See Figure 1 in Appendix for a graphic of the geographic range of the Culvert Repair Programmatic Agreement Pilot Project.

Culvert Repair Programmatic Agreement Pilot Project Repair Sites

The location of the projects are shown in Figure 2 in Attachment A.

2015

No projects were completed under the Culvert Repair Programmatic Agreement in 2015.

2016

ODOT made repairs at six culverts in 2016 with fish passage improvements provided at each site. Table 1 summarizes the fish passage improvements made at each 2016 culvert repair site, the potential for native migratory fish habitat above the site and the species benefitted.
Table 1. 2016 Culvert Repair Locations, Fish Passage Improvements, and Species Benefitted.

<table>
<thead>
<tr>
<th>Region</th>
<th>Stream Name</th>
<th>HWY</th>
<th>MP</th>
<th>Maximum Potential NMFS Habitat (in miles)</th>
<th>Passage Improvement</th>
<th>Cutthroat Trout</th>
<th>Coho Salmon</th>
<th>Steelhead/Rainbow Trout</th>
<th>Chinook Salmon</th>
<th>Bull Trout</th>
<th>Pacific Lamprey</th>
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<td>•</td>
<td>•</td>
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<td>OR 51</td>
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X = Present

• = Present and ESA Listed

OR126 MP 15.13 Potter Creek Culvert Repair (completed September 23, 2016)

Pre-treatment Fish Passage Condition. Potter Creek is a tributary to the McKenzie River in the Willamette River Basin just east of Walterville, Oregon. Potter Creek is seasonal some dryer years but may remain perennial in other wetter years in the reach where the OR126 MP 15.13 culvert crossing is located. It is utilized by cutthroat trout, steelhead, juvenile Chinook salmon, largescale sucker, mountain whitefish, norther pikeminnow, and bull trout during periods of the year they are able to successfully access it and adequate water quality persists.

The pre-treatment culvert condition was a 10 foot by 7 foot arch pipe metal culvert, 55 feet in length and installed at an approximate slope of <1%. The approximate average active channel width in Potter Creek upstream and downstream was estimated at 17 feet in width. During project scoping, the culvert outlet was backwatered approximately 12 inches above the culvert invert. Substrate ranging from cobbles to fines in size had accumulated along the length of the culvert invert. Pre-treatment hydraulic condition likely resulted in flow depths less than 6 inches at the culvert inlet during some portions of the juvenile salmonid migration periods and velocities in excess of 2 feet per second during some portions.
of juvenile salmonid migration periods. Therefore the pre-treatment conditions resulted in a partial upstream barrier for both adult and juvenile salmonids and other NMF species during a portion of the range of stream flows when NMF need to migrate (flows ranging from the 5% to 95% of the daily exceedance stream discharge). Biological implications from these pre-treatment passage impediments likely included the delay of upstream fish passage during portions of most years and the possibility of underutilization of upstream reaches during periods when NMF would use habitats available upstream of the culvert.

**Post-treatment Fish Passage Condition.** The Potter Creek culvert repair included a concrete invert pave and the placement of large (~ 20” diameter) offset fish rocks throughout the length of the culvert invert. The hydraulic performance of these offset fish rocks increased post-treatment water depth conditions at low flow conditions and to slow post-treatment water velocities conditions across the range of stream discharges (flows ranging from the 5% to 95% of the daily exceedance stream discharge). This increased the window of hydraulic conditions necessary for successful upstream migration for both adult and juvenile NMF. This has resulted in better utilization of habitats found in the upper reaches of Potter Creek. Metal supports used to keep the boulders in place while the cement was setting were left in place by the contractor. Subsequent monitoring identified this as a potential problem and these were removed in 2018.

Potter Creek Culvert pre-treatment (left), post-treatment (right)

**OR 51 MP 2.92 Oakpoint Creek Culvert Repair (completed October 13th, 2016)**

**Pre-treatment Fish Passage Condition.** Oakpoint Creek is a tributary to Rickreall Creek in the Willamette River Basin north of Independence, Oregon. Oakpoint Creek is seasonal in nature and typically becomes intermittent during the summer low flow period in the reach where the OR 51 MP 2.92 culvert crossing is located. It is utilized by cutthroat trout, steelhead, juvenile Chinook salmon, largescale suckers and northern pikeminnow during periods of the year they are able to successfully access it and adequate water quality persists. The pre-treatment culvert condition was a 14 foot diameter multi-plate round metal culvert, 132 feet in length and installed at an approximate slope of <1%. The approximate
average active channel width in Oakpoint Creek upstream and downstream was estimated at 17 feet in width. During project scoping, the culvert outlet was backwatered approximately 12 inches above the culvert invert. A slight volume of substrate ranging in size from cobbles to fines had accumulated along the culvert invert. Pre-treatment hydraulic condition likely resulted in flow depths less than 6 inches at the culvert inlet during some portions of the juvenile salmonid migration periods and likely velocities in excess of 2 feet per second during some portions of juvenile salmonid migration periods. Therefore the pre-treatment conditions likely resulted in a partial upstream barrier for both adult and juvenile salmonids and other NMF species during a portion of the range of stream flows when NMF need to migrate (flows ranging from the 5% to 95% of the daily exceedance stream discharge). Biological implications from these pre-treatment passage impediments included the delay of upstream fish passage during portions of most years and the possibility of underutilization of upstream reaches during periods when NMF would use the rearing and refugia habitats available upstream of the culvert.

**Post-treatment Fish Passage Condition.** The Oakpoint Creek culvert repair included a concrete invert pave, instillation of a series of lateral supports above the ordinary high water flow line within the structure, and the placement of large (~ 24” diameter) offset fish rocks throughout the length of the culvert invert. The hydraulic performance of these offset fish rocks has increased post-treatment water depth conditions at low flow conditions and slowed post-treatment water velocities across the range of stream discharges (flows ranging from the 5% to 95% of the daily exceedance stream discharge). The biological implications of these measures increased the window of hydraulic conditions necessary for successful upstream migration for both adult and juvenile NMF. This has resulted in better utilization of rearing and refugia habitats found in the upper reaches of Oakpoint Creek.

Oakpoint Creek Culvert pre-treatment (left), post-treatment (right)

**I-5 MP 150.85 Wilson Creek Culvert Repair (completed October 26\(^{th}\), 2016)**

**Pre-treatment Fish Passage Condition.** Wilson Creek is a tributary to Yoncalla Creek in the Umpqua Basin north of Rice Hill, Oregon. Wilson Creek is seasonal in nature and typically dries up during the summer low flow period in the reach where the I-5 MP 150.85 culvert crossing is located. It is used by cutthroat trout, steelhead, and Coho salmon during periods of the year they are able to successfully access it.
Wilson Creek is also assumed to be current or historic habitat for Pacific lamprey. The pre-treatment culvert condition was a 7 foot diameter multi-plate round metal culvert, 270 feet in length and installed at an approximate slope of 1 to 2%. The approximate average active channel width in Wilson Creek upstream and downstream was estimated at 10 feet in width. During project scoping, the culvert outlet was backwatered approximately 20 inches above the culvert invert. A significant volume (>1-2 feet deep) of substrate ranging from gravels to fines in size had accumulated throughout the culvert invert. Pre-treatment hydraulic condition likely resulted in flow depths less than 6 inches during some portions of the juvenile salmonid migration periods and velocities well in excess of 2 feet per second during portions of juvenile salmonid migration periods. Therefore the pre-treatment conditions likely resulted in a partial upstream barrier for both adult and juvenile salmonids during a portion of the range of stream flows when NMF need to migrate (flows ranging from the 5% to 95% of the daily exceedance stream discharge). Biological implications from these pre-treatment passage impediments included the delay of upstream fish passage during portions of most years and the possibility of under seeding of upper reaches with adults salmonids in low water years.

**Post-treatment Fish Passage Condition.** The Wilson Creek culvert repair included the instillation of 16, corner baffles, ranging from 27 inches in height at the high side and 6 inches in height at the low side relative to the culvert invert. The anticipated hydraulic performance of these corner baffles is to increase post-treatment water depth conditions by a minimum of 6 inches at low flow conditions and to slow post-treatment water velocities conditions across the range of stream discharges (flows ranging from the 5% to 95% of the daily exceedance stream discharge). The anticipated biological implications are to increase the window of hydraulic conditions necessary for successful upstream migration for both adult and juvenile NMF. This will result in improved seeding of the upper reaches of Wilson Creek, particularly during low water years.

Wilson Creek Culvert pre-treatment (left), post-treatment (right)
I-5 MP 122.53 “Fairgrounds Creek” Culvert Repair (completed in September 2016)

Pre-treatment Fish Passage Condition. “Fairgrounds Creek” is technically an unnamed tributary to the South Umpqua River south of Roseburg, Oregon. Fairgrounds Creek is seasonal in nature along the reach where the I-5, MP 122.53 culvert crossing is located. It is used by cutthroat trout, steelhead, and Coho salmon during years they are able to successfully access it. Fairgrounds Creek is also assumed to be current or historic habitat for Pacific lamprey. The pre-treatment culvert condition was a 5 foot diameter round corrugated metal culvert, 450 feet in length and installed at an approximate slope of 2 to 3%. The Fairgrounds Creek culvert has dual ownership with ODOT owning and maintain the inlet end of the culvert (under Interstate 5) for the first 250 ft. and Douglas County owning and maintaining the outlet end (under the county fairgrounds infrastructure). The approximate average active channel width in Fairgrounds Creek upstream was estimated at 6 feet. During project scoping, only the inlet end of the culvert was assessed and no stream substrate was observed in the inlet or barrel of the culvert. Pre-treatment hydraulic condition likely resulted in flow depths less than 12 inches during most portions of the adult salmonid migration periods and velocities in excess of 2 feet per second during most portions of juvenile salmonid migration periods. Therefore the pre-treatment conditions likely resulted in a partial upstream barrier for both adult and juvenile salmonids during most of the range of stream flows used for migration (flows ranging from the 5% to 95% of the daily exceedance stream discharge). Biological implications from these pre-treatment conditions included prevention or delay of upstream fish passage during most portions of the year and the possibility of under seeding of the upper reaches of Fairgrounds Creek with adults salmonids in low water years.

Post-treatment Fish Passage Condition. The Fairgrounds Creek culvert repair included the installation of precast concrete roughness features throughout the ODOT owned portion of the culvert. Roughness features were comprised of 8 inch equilaterally triangular columns. The hydraulic performance of these roughness features increased post-treatment low flow water depth conditions and improved post-treatment water velocity conditions across the range of stream discharges (flows ranging from the 5% to 95% of the daily exceedance stream discharge). The reason pre-cast roughness features were selected over weirs or baffles was because the proposed treatment was only to be applied in the ODOT owned portion of the culvert barrel. It was anticipated that any NMF entering the culvert outlet would already be expending significant effort in the untreated county owned portion of the culvert barrel and any additional hydraulic jump at the transition point into the treated portion of the culvert barrel could be an impediment to successful upstream passage. ODOT and ODFW staff agreed that these precast roughness features would be the best experimental design treatment to create the desired hydraulic outcome while minimizing the likelihood of an unanticipated detrimental hydraulic outcome at the transition point of culvert ownership. The biological implications of these improvements increased the window of hydraulic conditions necessary for successful upstream migration for both adult and juvenile NMF. This will result in improved seeding of the upper reaches of Fairgrounds Creek.
I-5 MP 110.31 Vandine Creek Culvert Repair (completed October 26th, 2016)

Pre-treatment Fish Passage Condition. Vandine Creek is a tributary to the South Umpqua River north of Myrtle Creek, Oregon. Vandine Creek is seasonal in nature and typically dries up during the summer low flow period in the reach where the I-5, MP 110.31 culvert crossing is located. It is used by cutthroat trout, steelhead, and Coho salmon during periods of the year they are able to successfully access it. Vandine Creek is also assumed to be current or historic habitat for Pacific lamprey. The pre-treatment culvert condition was an 8 foot diameter multi-plate round metal culvert, 327 feet in length and installed at an approximate slope of 3 to 4%. The approximate average active channel width in Vandine Creek upstream and downstream was estimated at 13 feet in width. During project scoping, a culvert outlet perch was observed of approximately 10 feet. The culvert outlet is located on bedrock, so that even without the culvert there would be a significant natural step or falls at this location. Significant volume (>1-2 feet deep) of substrate ranging from boulders to fines in size had accumulated throughout the culvert invert.

The Vandine Creek culvert is located at confluence of Vandine Creek and the South Umpqua River. The extreme annual variance in the river height of the South Umpqua River causes the jump height into the culvert outlet to vary between approximately 10 feet at low flow to a backwatered condition during the high flow events. Pre-treatment hydraulic condition likely resulted in flow depths less than 12 inches during portions of the adult salmonid migration periods and velocities well in excess of 2 feet per second during some portions of juvenile salmonid migration periods. It is theorized that by the time the South Umpqua River reaches a discharge approaching the 5% daily exceedance stream flows allowing NMF fish to access the culvert outlet, the flow in Vandine Creek has already crested and is likely much less than the 5% daily exceedance flow. Therefore the pre-treatment condition resulted in a nearly complete upstream barrier for both adult and juvenile salmonids except during this short coincidental time period when discharges were near 5% daily exceedance flow in the South Umpqua River and discharges in Vandine Creek are still high enough to allow for adequate water depth for upstream migration of adult or juvenile NMF. Biological implications from these pre-treatment conditions likely
included significant delay or complete barrier of upstream fish passage during most portions of the year and the under seeding or no seeding in the upper reaches of Vandine Creek by adult NMF most water years.

Post-treatment Fish Passage Condition. The Vandine Creek culvert repair included the instillation of 15, corner baffles, all placed on the same side of the culvert invert. Placing the corner baffles on the same side is providing better conveyance of stream sediments. The hydraulic performance of these corner baffles is to increase post-treatment water depth conditions by a minimum of 6 inches at low flow conditions and to slow post-treatment water velocities conditions across the range of stream discharges (flows ranging from the 5% to 95% of the daily exceedance stream discharge). The incremental fish passage benefit strategy is to increase the hydraulic conditions that allow for greater upstream passage for both adult and juvenile NMF when the discharge in the South Umpqua River allows NMF access to the culvert outlet. The biological implications of these improvements are to increase the window of hydraulic conditions necessary for successful upstream migration for both adult and juvenile NMF. This will likely result in greater use of Vandine Creek’s rearing and refugia habitats for both adult and juvenile NMF, particularly during high flow events in the South Umpqua Basin.

I-5 MP 110.31 Vandine Creek Culvert pre-treatment (left), post-treatment (right)

I-5 MP 40.23 Blackwell Creek Culvert Repair (completed in October of 2016)

Pre-treatment Fish Passage Condition. Blackwell Creek is a tributary to the Upper Rogue River west of Medford, Oregon. Blackwell Creek is seasonal in nature along the reach where the I-5, MP 40.23 culvert crossing is located. It is used by cutthroat trout, steelhead, and Coho salmon. The pre-treatment culvert condition was a 9 foot diameter multi-plate round metal culvert, 136 feet in length and installed at an approximate slope of <1%. The approximate average active channel width in Blackwell Creek upstream and downstream was estimated at 6 feet in width. During project scoping, a backwatering of the culvert outlet was observed of approximately 12 inches of water depth and fine sediment had accumulated along the entire length of the culvert invert. Pre-treatment hydraulic conditions likely resulted in flow depths less than 12 inches during portions of the adult salmonid migration periods and velocities in excess of 2 feet per second during portions of juvenile salmonid migration periods. Therefore the pre-treatment conditions likely resulted in a partial upstream barrier for both adult and juvenile salmonids.
during a portion of the range of stream flows when NMF need to migrate (flows ranging from the 5% to 95% of the daily exceedance stream discharge). Biological implications from these pre-treatment passage impediments likely included the delay of upstream fish passage during portions of most years and under seeding of upper reaches with adult salmonids in low water years.

**Post-treatment Fish Passage Condition.** The Blackwell Creek culvert repair included the installation of six weirs 15 inches in height with 6-inch low flow notches (height of notch relative to the culvert invert elevation). The hydraulic performance of these post-treatment weirs is to increase water depth conditions by a minimum of 6 inches at low flow conditions and to slow post-treatment water velocities across the range of stream discharges when NMF migrate (flows ranging from the 5% to 95% of the daily exceedance stream discharge). The biological implications of these improvements increased the window of hydraulic conditions necessary for successful upstream migration for both adult and juvenile NMF. This has resulted in improved seeding of the upper reaches of Blackwell Creek, particularly during low water years. During the initial evaluation and during construction, the culvert was backwatered. Further monitoring showed that downstream conditions changed during winter high flows and that the first weir on the downstream side was creating an impediment during low flow conditions. To address this, fish rocks were placed downstream to increase the depth and to further backwater the culvert.

Blackwell Creek Culvert pre-treatment (left), post-treatment (right)

2017

ODOT completed 9 projects in 2017 under the Culvert Repair Programmatic Agreement with associated fish passage improvements. Table 2 shows the repair site locations, the amount of native migratory fish habitat above the repair site and species benefitted.
Table 2. 2017 Culvert repair locations, native migratory fish habitat above the repair site and species benefitted.

<table>
<thead>
<tr>
<th>Region</th>
<th>Stream Name</th>
<th>Hwy</th>
<th>MP</th>
<th>Maximum Potential NMF Habitat (in miles)</th>
<th>Passage Improvement</th>
<th>Cutthroat Trout</th>
<th>Coho Salmon</th>
<th>Steelhead / Rainbow Trout</th>
<th>Chinook Salmon</th>
<th>Bull Trout</th>
<th>Pacific Lamprey</th>
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X = Present
● = Present and ESA listed

**I5 MP 223.32 Tributary of the Calapooia River Culvert Repair (Completed 6/2018).**

*Pre-treatment passage condition:* This unnamed tributary to the Calapooia River in the Willamette River Basin crosses Interstate 5 south of Tangent, Oregon. This tributary runs through agricultural fields and typically becomes intermittent during the summer low flow period. It provides high flow refugia to coastal cutthroat trout during the periods of the year cutthroat trout are able to access it and stream flow persists. The pre-treatment fish passage condition consisted of four culverts that were failing and in need of maintenance. The majority of the length of the culverts were made of concrete with the last 50’
of both ends made of corrugated metal pipe. The concrete sections of the pipe were functioning well but the corrugated metal sections were rusted out. Although velocities in the culverts due to low slope was likely not a passage issue, pre-treatment hydraulic conditions resulted in low flow depths through the culverts resulting in a partial fish passage barrier during a portion of the range of flows cutthroat trout need to migrate (flows ranging between 5% and 95% of the daily exceedance stream discharge). This resulted in the delay of upstream passage during portions of the year when cutthroat trout are seeking high flow refugia upstream of the culverts.

Post-treatment fish passage condition: The repairs completed at this unnamed tributary to the Calapooia River included replacing the 50’ corrugated metal pipes on the ends with new concrete pipe via an open trench. One section of the pipe replacement was not completed in 2017 and was finished in June of 2018. Steel corner baffles were then installed on one of the four culverts to increase the depth within the culvert. The 50’ inlet section of the pipe with baffles was installed at 0% slope to ensure it was lower than the other culverts creating a low flow channel and increasing depth. The hydraulic performance of the baffle installation is expected to increase depth through the culvert providing improved fish passage conditions across a wider range of flow conditions. The biological implications of increasing the window of hydrological conditions for successful upstream migration for both adult and juvenile cutthroat trout will result in better utilization of high flow refugia habitat upstream of this Interstate 5 culvert.

I5 MP 223.32 Unnamed Tributary of the Calapooia River pre-treatment (left) and post-treatment (right)

I-5 MP 227.47 Tributary of Lake Creek Culvert Repair (Completed 10/2017)

Pre-treatment Fish Passage Condition: This unnamed tributary of Lake Creek near Tangent, Oregon, crosses Interstate 5 through a series of four 246’ failing culverts that required maintenance. Most of the length of the culverts are concrete but the last 50’ on both ends is rusting corrugated metal pipe. Maintenance of the culverts included replacing the corrugated metal pipe with concrete pipe. Lake Creek is a tributary of the Calapooia River in the Willamette Basin. This tributary runs through largely
Agricultural land and provides high flow refugia and rearing habitat for cutthroat trout when suitable flows are present. This creek typically becomes intermittent during the summer low flow period. Pre-treatment hydraulic condition likely resulted in flow depths less than 6” during some portions of the migratory periods resulting in a partial upstream barrier to habitat above the culvert. Biological implications include the delay of fish passage to upstream habitat during portions of most years.

**Post-treatment fish passage conditions:** The unnamed tributary of Lake Creek repair included replacing interior sections of the 3’ rusted corrugated metal pipe and adding cement end treatments. Fish passage improvements include channel weirs that will backwater the culvert without creating a jump height greater than 6”. This unnamed tributary to Lake Creek is largely seasonal and commonly dries up in the summer. Increasing water depth will allow native migratory fish (cutthroat trout) access to additional rearing and high flow refugia above Interstate 5. The expected biological impacts are increased access to habitat when the channel is flowing, and increased passage resulting in higher survival during high flow events.

**I5 MP 227.47 Tributary of Lake Creek Culvert Repair pre-treatment (left) and post-treatment (right)**

**I-5 MP 276.58 Senecal Creek Culvert Repair (Not Completed, expected to be finished in 2018 in-water work period)**

**Pre-treatment fish passage condition:** Senecal Creek is a tributary of Mill Creek in the Willamette Basin which crosses Interstate 5 near Donald, Oregon. The structurally degraded culvert that conveys Senecal Creek was failing and in need of maintenance. There is approximately 2.69 miles of cutthroat trout habitat above the Interstate 5 culvert on Senecal Creek. The pre-treatment culvert condition was a 12 foot culvert, 370 feet in length with a low slope. Maintenance actions to repair the culvert included application of centrifugally cast reinforced concrete liner. This work was not completed in 2017 and will be completed during the in-water work period of 2018.

The approximate active channel width above and below the culvert is estimated at 13’ in width. Pre-treatment hydraulic conditions likely resulted in velocities in excess of 2 feet per second during some portion of the migration period resulting in a partial barrier. These conditions resulted in a delay in fish passage for juvenile and adult cutthroat trout during portions of most years.
Post-treatment fish passage conditions: Due to high flows and the late start during the inwater work period, this project was not completed in 2017 and is expected to be finished in 2018. Once completed, the Senecal Creek tributary culvert will include the installation of fish rocks throughout the culvert. The anticipated hydraulic performance of these roughness features is to increase post-treatment low flow water depth conditions and to slow high flow post-treatment water velocity conditions across a range of stream discharges. The anticipated biological implications for both adult and juvenile cutthroat trout are to increase the hydraulic conditions necessary for successful upstream fish passage resulting in better seeding of the habitat upstream of the Interstate 5 culvert.

Senecal Creek pre-treatment (left) and post-treatment (incomplete-right)

I-5 MP 278 Senecal Creek Tributary Culvert Repair (Completed 9/2017)

Pre-treatment fish passage condition: This unnamed tributary of Senecal Creek crosses Interstate 5 near Donald, OR. Senecal Creek flows into Mill Creek which flows into the Clackamas River in the Willamette Basin. There is approximately 0.35 miles of cutthroat trout habitat upstream of the culvert. The active channel width near the culvert is estimated to be 7 feet in width. The six foot culvert was in critical condition and required maintenance. The outlet is not perched at this location. Maintenance at this culvert included the application of centrifugally cast reinforced concrete liner. The pre-treatment passage conditions included an undersized 350 foot long culvert that likely lacked sufficient depth at some flows and velocities greater than 2 feet per second at higher flows providing a partial fish passage barrier. The biological implications include the the delay of fish passage during migratory periods during most years resulting in reduced seeding above the culvert.

Post-treatment fish passage conditions: Culvert repair fixes included centrifugally cast concrete. The fish passage improvements associated with the Senecal Creek Tributary included the installation of fish rocks to increase depth, increase the hydraulic complexity and slow velocities. This project improved fish
passage success across a larger range of flows for cutthroat trout. The anticipated biological conditions are improved seeding of cutthroat trout in the upper Senecal Creek watershed and improved migration to cooler water during warmer periods of the year.

**Senecal Creek Tributary pre-treatment (left) and post treatment (right)**

**OR99W MP 19.22 Cedar Creek Culvert Repair (Completed 10/2017)**

**Pre-treatment fish passage condition:** The Cedar Creek culvert required significant maintenance, which included a cured in place pipe liner on the upstream end of the culvert. Cedar Creek is a tributary of Chicken Creek which flows into the Tualatin River in the Willamette Basin near Chehalem, Oregon. There are approximately 2.42 miles of native migratory fish habitat above the OR99W culvert which provides habitat to cutthroat trout, Pacific lamprey and ESA listed winter steelhead. The habitat above the culvert is largely residential resulting in a flashy system producing high flow velocities in the culvert during significant precipitation events. The culvert has significant slope and is perched approximately 6” at low flows. The high velocities present during higher flows create a partial barrier and result in delayed fish passage at this site. During lower flows, the perched culvert creates a partial barrier for native migratory fish and a complete barrier for Pacific lamprey. The biological implications for the pre-treatment condition results in a full or partial barrier for native migratory fish for many flow conditions during most years.

**Post-treatment fish passage conditions:** The Cedar Creek culvert repair includes the installation of metal corner weirs throughout the culvert and the installation of a rock weir downstream to backwater the culvert to a depth of 6 inches. During post project inspection of the corner weirs it was noted that the corner baffles were not properly fitted to the culvert and gaps exist below the baffles, although debris and sediment appear to be filling these gaps. The weir also inadequately retained water sufficient to backwater the culvert to a depth of six inches as designed. A second weir will be installed to accommodate the jump height at the original weir. Due to high precipitation, these issues were not able to be fixed in 2017. These issues will be monitored as described in the Culvert Repair Programmatic Agreement and addressed in the 2018 or 2019 in-water work period depending on receiving the proper permits to complete the work.
OR99W MP 19.22 Cedar Creek Culvert Repair. Before (left), after repair (right)

I-5 MP 126.4 Sweetbriar Creek Culvert Repair (Completed 8/2017)

Pre-treatment Fish Passage Conditions. The Sweetbriar Creek culvert that crosses I-5 (and the northbound and southbound off ramps) was in critical condition and in need of repairs. The culvert had significant rust in the invert. The existing corrugated metal pipe culvert is a 5’ pipe that extends for 308’ and is undersized given the 7’ active channel in this reach. The culvert is set at a low slope.

Sweetbriar Creek, in Roseburg, OR, is impacted by urbanization but still supports cutthroat trout for about a third of a mile above the culvert. Sweetbriar is a tributary of Newton Creek which flows into the South Umpqua River. Summer flows can get very low in Sweetbriar Creek and given the impervious surface impacts in the basin, the creek can get very flashy during high precipitation. Biological implications from the pre-treatment passage impediments included the delay of upstream fish passage during portions of most years and the possibility of under seeding the upper reach with adult cutthroat in low water years.
Post-treatment Fish Passage Conditions. The Sweetbriar Creek repair included paving the invert of the culvert to stabilize the culvert. To improve fish passage conditions, simulated fish rocks formed from concrete were installed in the culvert. The anticipated hydraulic performance of the simulated fish rocks is to increase post-treatment water depth during low flow conditions and to create flow complexity during higher flow events. This is expected to improve passage conditions across a range of stream flows. The anticipated biological effects are to increase passage opportunities during most years and the increased seeding of the upper reach.

I-5 MP 126.4 Sweetbriar Creek Culvert Repair. Before (left), after repair (right)

I-5 MP 165.9 Pass Creek Culvert Repair (Completed 9/2017)

Pre-treatment Fish Passage Condition. Pass Creek is a major tributary of Elk Creek which flows into the Umpqua River. There is approximately 4.88 miles of native fish habitat above the culvert on Interstate 5 at MP 165.9. Salmonids present in Pass Creek include cutthroat trout, Coho salmon and winter steelhead and a number of non-salmonid native species reside in this reach. Due to a large basin size above the culvert, winter flows can be high during periods of heavy precipitation, exceeding two feet per second during some portion of the upstream migration period. Therefore, the pre-treatment conditions likely resulted in a partial upstream passage barrier for both adult and juvenile salmonids during some portion of most years. Biological implications from these pre-treatment passage impediments likely included the delay of upstream passage and the underutilization of the upstream reaches during periods when native migratory fish would use the spawning, rearing and refugia habitats upstream of the culvert.
The pre-treatment condition of the 12’ foot culvert at I5 MP 165.90 on Pass Creek was in critical condition and went underneath 4 lanes of I5 for 254’. The corrugated metal pipe had significant rust present on the invert. The active channel width in this area is 8’. At the time of the site visit, there was no drop from the culvert outlet to the plunge pool on the downstream side.

**Post-treatment Fish Passage Condition.** The Pass Creek culvert repair included a concrete invert pave to seal the rusting floor. Fish passage improvements included the installation of formed concrete fish rocks. The anticipated hydraulic performance of these concrete fish rocks is to increase water depth at low flow conditions and reduce high flow velocity conditions and to increase hydraulic complexity within the culvert. The anticipated biological implications are to increase the window of hydraulic conditions necessary for successful upstream migration for both adult and juvenile native migratory fish. This will result in better utilization of spawning, rearing and high flow refugia found above the culvert in the upper reaches of Pass Creek.

This invert pave created a significant jump into the culvert on the downstream end during low flow conditions. This was identified during 2018 monitoring and will be addressed during the 2018 inwater work period through the installation of a rock weir below the culvert to backwater the culvert.

**I-5 MP 165.9 Pass Creek Culvert Repair. Before (left), after repair (right)**

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**OR38 MP 6.42 Unnamed tributary to the Umpqua River Culvert Repair (Completed 8/2017)**

**Pre-treatment Fish Passage Conditions.** This unnamed tributary flows directly into the Umpqua River and was in poor condition and in need of repair. There is approximately 1/3 of a mile of native migratory fish habitat above the crossing which is used by cutthroat trout. Given the close proximity to the Umpqua River it is possible other native migratory fish present in the mainstem Umpqua River use this lower reach as well for high flow refugia. Pre-treatment hydraulic conditions provided passage impediments during both low and high flow periods resulting in delayed upstream fish passage for native migratory fish during most years. The biological implications of these impacts result in underutilization of the upper reach of the stream.
The active channel width is 6.75’ and the culvert is undersized at 6’. A 20’ portion of the culvert invert was severely rusted. The culvert goes under Highway 38 for 55’. The culvert was not perched pretreatment and is low gradient.

**Post-treatment Fish Passage Conditions.** This 6’ culvert on this unnamed tributary to the Umpqua River was repaired by applying centrifugally cast concrete. To improve fish passage, concrete culvert weirs were installed with low flow notches. The anticipated hydraulic performance of these weirs is to increase depth during low flow conditions and to create hydraulic complexity and slow water during high flow conditions (5-95% of the daily exceedance stream discharge). The anticipated biological implications are to increase the window of hydraulic conditions necessary for successful upstream migration for both adult and juvenile native migratory fish. This will result in better utilization of the spawning, rearing and refugia habitats found upstream of the culvert.

**OR38 MP 6.42 Unnamed tributary to the Umpqua River Culvert Repair. Before (left), after repair (right)**

OR38 MP 6.92 Unnamed tributary to the Umpqua River Culvert Repair (Completed 8/2017)

**Pre-treatment Fish Passage Conditions.** This unnamed tributary flows directly into the Umpqua River and provides about 0.53 miles of native migratory fish habitat for cutthroat trout. Given the close proximity to the Umpqua River it is possible other native migratory fish present in the mainstem Umpqua River use this lower reach as well for high flow refugia. Pre-treatment hydraulic conditions provided passage impediments during both low and high flow periods resulting in delayed migratory passage for native migratory fish during most years. The biological implications of these impacts result in underutilization of the upper reach of the stream.

The 6’ culvert is undersized given the active channel width is 7’, likely increasing flows above 2’ per second during some portion of most years. The culvert is low gradient. Given the tidal influence of the
downstream end of the culvert, the culvert fluctuates between being perched up to one foot to being tidally backwatered.

Post-treatment Fish Passage Conditions. This 6’ culvert on this unnamed tributary to the Umpqua River was repaired by paving the invert. To improve fish passage, concrete culvert weirs were installed with low flow notches. The anticipated hydraulic performance of these weirs is to increase depth during low flow conditions and to create hydraulic complexity and slow water during high flow conditions (5-95% of the daily exceedance stream discharge). The anticipated biological implications are to increase the window of hydraulic conditions necessary for successful upstream migration for both adult and juvenile native migratory fish. This will result in better utilization of the spawning, rearing and refugia habitats found upstream of the culvert.

OR38 MP 6.92 Unnamed tributary to the Umpqua River Culvert Repair. Before (left), after repair (right)

ODOT Fish Passage Compensation Fund Projects

A provision of the Culvert Repair Programmatic Agreement requires ODOT to provide ODFW $1.8 million to specifically address high priority fish passage projects statewide regardless of ODOT ownership and independent of geographic location. ODFW issued a request for proposals to allocate these fish passage funds. A review team consisting of ODFW, ODOT and a Fish Passage Task Force member evaluated all submitted proposals. The $1.8 million was allocated to five projects. The Fish Passage Compensation Fund projects, benefit to Native Migratory Fish and location are in Table 3. The locations of the Fish Passage Compensation Projects are shown in Figure 3 in Attachment A.

ODOT additionally voluntarily dedicates $4.2 million per year to providing full fish passage at high priority fish passage sites on the Oregon highway system regardless of the condition of the infrastructure. The CRPA required them to continue this as a condition of the agreement.
Table 3. Fish Passage Compensation Fund Projects, Benefit to Native Migratory Fish and Location.

<table>
<thead>
<tr>
<th>Project Name</th>
<th>Basin</th>
<th>Actual / Projected Completion</th>
<th>Access provided to NMF Habitat (in miles)</th>
<th>Habitat Quality</th>
<th>Degree of Barrier</th>
<th>Project Cost</th>
<th>Compensat ion Funds</th>
</tr>
</thead>
<tbody>
<tr>
<td>E.F. Millicoma River</td>
<td>Coos</td>
<td>2016</td>
<td>16.0</td>
<td>Good</td>
<td>Partial</td>
<td>$1,148,431</td>
<td>$150,000</td>
</tr>
<tr>
<td>Odell Creek Dam</td>
<td>Hood</td>
<td>2016</td>
<td>3.5</td>
<td>Good</td>
<td>Complete</td>
<td>$349,400</td>
<td>$65,000</td>
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<tr>
<td>Oak Ranch Creek</td>
<td>Nehalem</td>
<td>2018</td>
<td>9.5</td>
<td>Excellent</td>
<td>Partial</td>
<td>$825,821</td>
<td>$285,000</td>
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<tr>
<td>Opal Springs Dam</td>
<td>Deschutes</td>
<td>2019</td>
<td>110.0</td>
<td>Good</td>
<td>Complete</td>
<td>$10,720,485</td>
<td>$1,200,000</td>
</tr>
<tr>
<td>Dairy Creek</td>
<td>Columbia / Willamette</td>
<td>2018</td>
<td>0.5*</td>
<td>Excellent</td>
<td>Partial</td>
<td>$1,463,541</td>
<td>$100,000</td>
</tr>
</tbody>
</table>

*Includes > 3,000 acres of floodplain lakes and sloughs

Table 4 shows the species benefited at each Fish Passage Compensation project.

Table 4: ODFW Compensation Projects for the CRPA. Fish Species Benefited at each Project site.

<table>
<thead>
<tr>
<th>Project Name</th>
<th>Cutthroat Trout</th>
<th>Coho-Salmon</th>
<th>Steelhead / Rainbow Trout</th>
<th>Chinook Salmon</th>
<th>Bull Trout</th>
<th>Pacific Lamprey</th>
<th>Large Scale Sucker</th>
<th>White Sturgeon</th>
<th>Mountain Whitefish</th>
</tr>
</thead>
<tbody>
<tr>
<td>E. F. Millicoma River</td>
<td>X</td>
<td>●</td>
<td>X</td>
<td>X</td>
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<td></td>
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<tr>
<td>Odell Creek Dam</td>
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</tr>
<tr>
<td>Oak Ranch Creek</td>
<td>X</td>
<td>●</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Opal Springs Dam</td>
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</table>

X = Present
● = Present and ESA listed
East Fork Millicoma River (completed 2016)

The East Fork Millicoma River (EFMR) is the largest tributary to the Millicoma River and is near Coos Bay, Oregon. The EFMR provides important habitat to Chinook, chum, Coho salmon, steelhead trout, Pacific lamprey and other native migratory fish. In 1958, two bridges crossing the East Fork Millicoma River were filled in, forming an artificial oxbow. Fill material was excavated from a ridge at the narrow point of the old meander, creating a steep bypass chute that is the current river location. The bypass chute was a velocity barrier prior to the project for all adult and juvenile salmonids, especially Chinook; limiting access to over 16 miles of potential habitat.

The restoration proposal reversed this severe alteration to the EFMR. The project installed bridges at the two historic oxbow crossings. Fill material from the bridge locations was returned to the existing bypass chute (shown in yellow on map to left) and returned all flows back through the oxbow, reconnecting the river’s original course (shown in red on map to left). The end result is significantly improved passage for all salmonids and reclaiming 0.6 miles of abandoned river channel. This project is part of a larger project to restore the entire EFMR watershed; whose goals are: 1) reconnect the EFMR Oxbow; 2) restore over 16 miles of degraded streams upstream from the Oxbow; and 3) reduce fine sediment inputs throughout the EFMR sub-watershed. This barrier was the highest ranked barrier on the southern Oregon coast and in the Coos-Coquille District.
Odell Creek (Completed 2016)

Odell Creek is a non-glacial tributary that joins the Hood River at RM 5.6. This project removed a 12 foot high concrete dam near the mouth of the creek, which restored year-round fish passage and improved important rearing habitat for threatened winter steelhead and resident trout. The dam included a fish ladder that was considered a complete barrier; it was in disrepair and included jump heights in excess of one foot. The lower Hood River’s winter steelhead population is considered both a core and genetic legacy population by the Willamette / Lower Columbia Technical Recovery Team.

The project removed the dam and fish ladder, and reconstructed the stream channel, banks, and floodplain. The stream was restored to its historic elevation behind the dam by removing an estimated 1,200 yd³, which was placed at an onsite, upland location. Other funds where obtained to install a new fish screen for an irrigation water and restoration of the riparian area.

Oak Ranch Creek (Scheduled for 2018)

This project will restore anadromous and resident fish passage and natural stream functions underneath Apiary Road (Columbia County) at mile post 15.7 at river mile 3.5 of Oak Ranch Creek. Replacing the 8’ diameter x 120’ long corrugated metal pipe with an open bottom 11.6’H x 39.0’W x 115.0’L concrete box culvert will make 9.5 miles of productive aquatic mainstream and tributary habitat accessible. ESA listed Coho salmon are the primary species of interest. Oak Ranch Creek also supports summer/fall run Chinook, winter steelhead, coastal cutthroat trout, and lamprey. Upstream of the culvert barrier a series of well-established beaver complexes and healthy riparian areas provide high quality habitat and production potential.
Removal of the remaining barrier will provide full access to the entire Oak Ranch system including highly productive headwater reaches containing some of best Coho salmon rearing habitat in the Upper Nehalem watershed. Oak Ranch Creek also provides significant rearing/refuge for juvenile salmon to escape lethal temperatures known to occur in the mainstream in the Nehalem River in the summer months.

**Opal Springs Dam (Scheduled for 2018-expected completion in 2019)**

The Proposed Project will provide upstream and downstream passage over the existing Opal Springs Hydroelectric Project’s (OHSP) 28.5 ft. earth fill dam by constructing a fish ladder to provide volitional upstream fish passage and a series of gates that would 1) provide supplemental flows to aid upstream fish passage; and 2) provide a downstream passage alternative to the existing intake. These actions will be monitored and evaluated against performance objectives, and a set of tiered adaptive measures are identified that will improve performance as needed. ODFW, National Marine Fisheries Service, and US Fish and Wildlife Service have all approved the design.

The OSHP is a 28.5 earthen-fill dam that was authorized in 1982 and commissioned in 1985. Salmon and steelhead were extirpated from the Upper Deschutes basin with the construction of the Pelton Round Butte Project (PRB Project) in the 1960s. Therefore, fish passage at OSHP was neither required nor provided at the time of licensing. In 2007, salmon and steelhead were reintroduced in the Upper Deschutes Basin, upstream of the PRB Project. Adult salmon and steelhead returned to the Upper Deschutes basin in late 2011. This reintroduction effort was the result of the completion of upstream and downstream passage facilities at the Pelton Project. The reintroduced fish are repopulating three major tributaries to the Deschutes River – these include the Upper Deschutes River, the Metolius River, and the Crooked River. The Project, located at the lower end of the Crooked River, is a passage barrier into this important tributary, which would otherwise provide significant spawning, rearing, and foraging habitat for these anadromous species. Bull trout, a federally listed species under the Endangered Species Act (ESA) are also present below the Project, which is considered critical habitat under the ESA. In the Crooked River sub basin thirteen barriers to fish passage upstream of the Project have been addressed systematically by multiple agencies. Once the Opal Springs barrier is addressed these actions will reconnect approximately 110 miles of habitat for NMF.

**Dairy Creek (Scheduled for 2018)**

Restoring fish passage at the Reeder Road crossing of Dairy Creek on Sauvie Island is an essential component of the greater “Sturgeon Lake Restoration Project”. Funds from this application would be used to remove two critical twelve foot diameter culverts that are both undersized for the channel width and create a fish passage barrier. They will be replaced with a 100 foot bridge that spans the full width of the creek. This Project is an ongoing, multi-stakeholder effort, to restore connectivity and fluvial processes in Sturgeon Lake, a shallow 3,000 acre, tidally influenced, floodplain lake. Sturgeon Lake is located in a key area of the lower Columbia River, and provides important foraging and rearing opportunity for 13 T&E listed salmonid ESU’s, lamprey, and sturgeon. Juvenile salmonids depend on slough and backwater habitats in the lower Columbia River for survival, and habitat like that provided by Sturgeon Lake fits a critical role from mid-fall to late spring, particularly during the spring freshet months
(May – June). Finally, Sturgeon Lake is also part of the Conservation Opportunity Area WV-01 within the Oregon Conservation Strategy.

**Analysis of Fish Passage Improvements**

Implementation of the ODOT Culvert Repair Programmatic Agreement Pilot Project during the three year agreement (2015-2017) period has been informative. The Oregon Department of Fish and Wildlife and Oregon Department of Transportation spent 18 months to develop the partnership agreement to make critical repairs to aging culverts in Western Oregon. The intent was to balance public safety, interstate mobility, watershed health and to be consistent with the Oregon Plan. These repairs do not meet full fish passage criteria, but passage is improved at each site. To offset the temporal delay to providing full fish passage, ODOT paid into an ODFW managed account that cost shared implementation of five high priority fish passage projects in the state. ODFW assists ODOT with the scoping of these sites to determine if they meet the sideboards of the CRPA.

The approval of the CRPA in October of 2014 resulted in a challenging timeline for culvert repairs to be implemented during the first year of the CRPA agreement (2015) and no projects were completed. The necessary scoping, design and contracting time was difficult given the timeline to meet the inwater work periods during which construction is allowed. During this period ODOT completed outreach and education for their staff on the development of the new program and some scoping was completed to identify potential future projects.

Six projects were completed in 2016 improving fish passage conditions to approximately 11.28 miles of native migratory fish habitat. This work benefited cutthroat trout, Coho salmon, steelhead trout, Chinook salmon, bull trout and other native species. Subsequent monitoring of the project sites identified a problem with the Potter Creek Project. Metal supports used to hold the fish rocks in place were never removed and created a potential snagging hazard to migrating native fish. This was identified during monitoring and were removed in 2018 by ODOT maintenance crews.

Nine projects were started in 2017 improving passage to approximately 16.4 miles of native migratory fish habitat. This work improved passage for cutthroat trout, Coho salmon, steelhead trout, Pacific lamprey and other native migratory species. Several projects were started late in the inwater work periods and three projects were not finished in 2017. High precipitation stopped the I5 MP 279.58 Senecal Creek project before the centrifugally cast cement work could be completed. This work will be completed during the 2018 inwater work period. Once construction began on I5 MP 223.32 for the Tributary to the Calapooia, additional sections of rusted culvert were found that needed to be replaced and some unexpected pipe sizes were identified and a portion of one of the four pipes could not be completed before the end of the inwater work period. This was completed in June of 2018. Subsequent monitoring also identified problems with two of the projects. At I5 MP 165.9 at Pass Creek, the culvert repair fix involved paving the invert. This created substantial additional height to the culvert which created a jump into the culvert at low flows that exceeded the design specifications. ODOT maintenance crews will coordinate with ODFW to install a rock weir below the culvert to backwater the culvert during the 2018 inwater work period. The rock weir at OR99W MP 19.22 at Cedar Creek inundated the culvert to a depth of 3”, not the 6” depth specified in the design drawings. This was caused by settling of the weir into the substrate. The weir will be rebuilt to meet the design depth of 6” and an additional downstream weir will be installed to reduce jump heights. This is expected to be completed during the
2018 inwater work period but may be pushed out to the 2019 inwater work period if the appropriate permits cannot be received in time.

While fewer projects were completed than were expected, several lessons were learned over the course of the three year pilot project. ODOT management and ODFW staff continue to work with ODOT staff to achieve the intended level of fish passage improvement at these sites as well as following up on the monitoring requirements and any corrective action that needs to occur. As noted in the preceding sections, projects that do not meet the intended design criteria are receiving the necessary attention and corrective actions to improve fish passage at these culvert repair sites.

The CRPA also excludes high priority culverts. This has been challenging as many of the larger culverts (4’ and larger) are more likely to be high priority culverts. The larger culverts have more space available for fish passage improvements and culvert repairs when considering hydraulic capacity. ODOT engineers need to consider the ability of a culvert to pass the expected exceedance flows; improvements to fix the culverts and improve fish passage often reduce the culverts ability to convey water. Smaller culverts are often not able to meet the hydraulic needs and also much more difficult to work in to complete the necessary structural fixes and fish passage improvements.

The 2014 CRPA appears to been an effective tool for ODOT to implement critical short term repairs (25 years or less expected durability) to culverts while providing fish passage improvements to aging culverts in Western Oregon. During the three year Pilot Project, 15 projects were completed, providing improved passage to approximately 27.68 miles of native migratory fish habitat. The Fish Passage Compensation Fund allowed ODFW to fund five high statewide priority fish passage restoration projects that will provide full criteria fish passage to approximately 139.5 miles of native migratory fish habitat and access to approximately 3,000 acres of floodplain lakes and sloughs. The ODOT Culvert Repair Programmatic Agreement Pilot Project resulted in a benefit to native migratory fish and Oregon’s transportation system.

The Oregon Department of Fish and Wildlife and Oregon Department of Transportation saw enough benefit from the program to create a new Programmatic Agreement. Given the low number of projects, the new agreement will still be a Pilot Project so that enough data can be collected to adequately assess the Project. Insight from the 2015-2017 Culvert Repair Programmatic Agreement Pilot Project resulted in a new five year ODOT Culvert Repair Programmatic Agreement Pilot Project that will be effective from 2018 to 2022. The Oregon Fish and Wildlife Commission approved this Agreement on 12-8-2017. Given what was learned from the 2015-2017 Pilot Project, several changes were made:

- A 5 year Agreement instead of 3
- ODOT will continue to fund the ODFW/ODOT Liaison position and will fund an additional assistant ODFW/ODOT Liaison position for the duration of the agreement. The second ODOT/ODFW liaison will focus on a culvert inventory and assist with other duties as needed.
- The Agreement will be statewide, not restricted to West of the cascades excluding the North Coast ODFW District
- Allows repairs at high priority fish passage sites but will now exclude projects on the 10 Year Implementation List. The Ten year Implementation List is a list of projects on the Oregon highway system that ODOT will use their Fish Passage Funds ($4.2 million per year) to restore full fish passage criteria.
• To offset the delay in full fish passage criteria at the Pilot Project repair sites, ODOT will provide ODFW $2 million at the beginning of the agreement for the first 40 projects completed. For each project past 40, ODOT will provide an additional $50,000. ODFW will manage these funds to address high priority fish passage projects statewide regardless of ODOT ownership and independent of geographic location.
• ODOT will continue to fund at least $4.2 million annually into the ODOT Fish Passage Program for the term of the agreement. These funds will be used to address the 10 year Implementation Plan.
• Maintenance, monitoring and reporting requirements are retained.

Annual and final reports for the updated CRPA will provide a better assessment of the effectiveness of the CRPA Pilot Project.
Figure 2. Culvert Repair Programmatic Pilot Project Repair Sites

The unnamed tributaries to the Umpqua River (OR38 MP 6.42 and 6.92) and the I5 MP 276.6 (Senecal Creek) and I5 MP 278 (Senecal Creek Tributary) are geographically very close together and can look like one location.
Figure 3. Locations of the Fish Passage Compensation Fund Sites