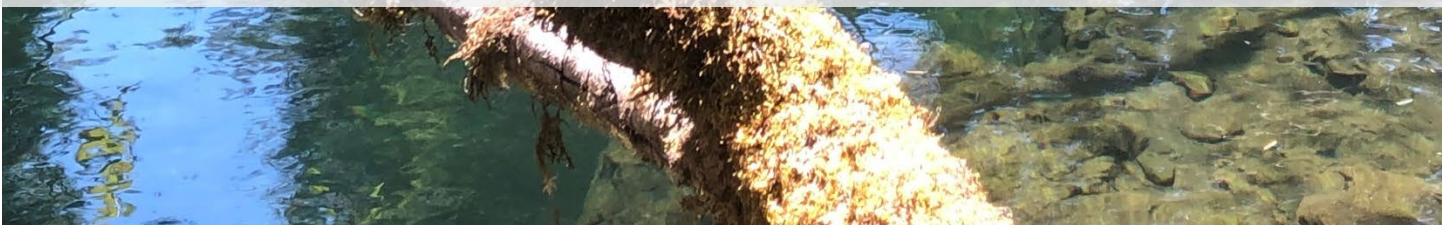




Culvert Repair Programmatic Agreement Pilot 2018 - 2022 Final Report

**Oregon Department of Transportation
June 2023**



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Executive Summary

The Oregon Department of Transportation (ODOT) and the Oregon Department of Fish and Wildlife (ODFW) implemented a five-year Culvert Repair Programmatic Agreement (CRPA) project that allowed ODOT to make specific short-term repairs to culverts without having to meet full fish passage criteria at the repair location. This enabled ODOT to make critical repairs of aging culverts in a cost-effective manner, while providing a benefit to Native Migratory Fish (NMF) over the status quo by improving fish passage at each site repaired. In addition, ODOT paid \$2.5 million into an ODFW-managed account that funded high priority fish passage restoration projects off the state highway system.

ODOT's culvert inventory has revealed that approximately 10,500 culverts are in poor or critical condition and require repair or replacement in the near term to maintain the safety and integrity of the state highway system. Based on current estimates, it would require over \$18.5 billion to replace all the culverts under the state highway network. The typical design life of a culvert can range from 25 to 75 years. Based on current funding allocations, it would take over 1,500 years to replace all the culverts owned and managed by ODOT. Culvert repair work on fish-bearing streams has largely been deferred over the past 22 years due to the inability to meet fish passage design criteria with a repair and the lack of available funding for full fish passage criteria replacements. Culvert repairs typically can be completed for \$50,000 to \$250,000. Culvert replacement projects that meet fish passage criteria can cost from \$1.5 million to over \$12 million each.

During this agreement, 40 culverts were repaired under the CRPA at 36 project locations. The total cost for these repairs was slightly over \$6.8 Million. The estimate to replace all these culverts was over \$111 Million. ODOT was able to defer over \$104 Million of cost to address these culverts by using the CRPA. However, this cost avoidance should be evaluated relative to the design life provided by the approach. The repairs have added approximately 10-25 years of life to these culverts, whereas full replacements would have provided a new design life of 75 years or more. However, even given the difference in life span for the two approaches, life cycle costs are much lower for the repair option.

Fish passage improvements at the culvert repair projects used a combination of eliminating jump heights, increasing water depths, and decreasing water velocities. These projects improved access to over 120 miles of potential habitat for NMF. Additionally, the \$2.5 million in ODOT provided Compensation Funds to ODFW contributed to improved NMF access to 572.6 miles and 3000 acres of habitat off the ODOT network.

The CRPA showcased how interagency coordination and collaboration creates positive outcomes. This mutually beneficial agreement allowed ODOT to make progress in maintaining the aging state highway system, while also providing on- and off-highway ecological benefits to NMF. Taxpayer dollars were used efficiently for culvert repair work, and hundreds of miles of potential habitat for NMF are made more accessible.

Due to the success of this pilot agreement, both agencies entered into a similar agreement beginning in 2023. This new agreement expands the agreement timelines to a ten-year period and increasing the amount of ODOT provided Compensation Funds to over \$8 Million.

Definitions

- **Backwatered:** When the water surface through the outlet of the culvert and downstream are equal.
- **Baffles:** A structure used to restrain the flow of water in a culvert to provide migrating fish a place to rest and create water depth during low flows.
- **Culvert:** A pipe or conduit used to convey water, utilities, livestock, wildlife, or equipment, from one side of the road to the other.
- **Fish passage:** The ability, by the weakest native migratory fish and life history stages determined by ODFW to require passage at the site, to move volitionally, with minimal stress, and without physical or physiological injury upstream and downstream of an artificial obstruction.
- **Fish rocks or fish blocks:** Are large rocks (or concrete blocks) placed in a stream or culvert to improve habitat, create scour holes, and areas of reduced velocity. Placing structures in the stream also creates eddies or vortices in their wake.
- **High priority barriers:** Any barrier found on the ODFW Fish Passage Priority List. Or determined by professional opinion to be a significant barrier to native migratory fish migration.
- **Hydraulic conditions:** The conditions of the stream crossing in the context of water velocity, depth, complexity, vertical profiles, and capacity.
- **In water work period:** Guidelines for timing of in water work, developed by ODFW and established to avoid impacts to the vulnerable life stages of native migratory fish including migration, spawning, and rearing.
- **Invert:** The bottom portions of a culvert. Usually, the first area of wear due to interaction with water and sediment transport.
- **NMF:** Native Migratory Fish species defined in OAR 635-412-0005 that includes 32 species of fish that migrate as for their lifecycle needs.
- **Perched condition:** When the outlet of the culvert is elevated above the downstream water surface creating a freefall condition.

- Poor and critical culvert condition: A culvert that scores a poor or critical has structural deficiencies that pose a danger to the traveling public, the environment, and the community connections, which warrant repair or replacement before a possible failure occurs.
- Roughened channel: An artificially built channel downstream of a culvert designed to alleviate a perch and match conditions in the surrounding streambed.
- Soil arch: The compacted soil that surrounds the culvert. This compacted soil holds the load of the above material and roadway traffic, relieving the pressure from the culvert itself.
- Tributary: A river or stream flowing into a larger river or lake.
- Weir: A low dam built across the stream channel or culvert designed to raise the water level upstream.

Background

ODOT and ODFW implemented a five-year programmatic agreement for culvert repair in Oregon spanning from 2018 to 2022. The Oregon Fish and Wildlife Commission approved the CRPA as a programmatic approval under Oregon fish passage rules (OAR 635-412-0020(3)b). This allowed ODOT to make specific short-term critical repairs to aging culverts without meeting full fish passage criteria at the repair location, but still providing a benefit to NMF over the status quo by improving fish passage at each site repaired.

This agreement followed and expanded upon a previous three-year pilot project for western Oregon. Under the first pilot CRPA, **ODOT was able to avoid over 70 million dollars of cost to repair instead of replacing these failing culverts** [ODOT 2019](#). This new five-year agreement expanded the service area to a statewide scale and allowed the CRPA to be used on high priority fish passage barriers. With both CRPAs, ODOT and ODFW continue to advance the Oregon Plan for Salmon and Watersheds habitat restoration goals, while allowing repairs to critical transportation infrastructure in locations where fish passage can be improved in a cost-effective manner.

As a condition of the agreement, ODOT agreed to pay \$2 million into an ODFW-managed account to fund high priority fish passage projects off the state highway system to offset delays in meeting full fish passage criteria at culvert repair locations. This payment allowed ODOT to use the agreement on 40 projects, with the opportunity for ODOT to pay an additional \$50,000 for each culvert repaired once the first 40 are complete. Based on the number of expected projects under the agreement, ODOT provided an additional \$500,000. ODOT also committed to continue funding the ODOT Fish Passage Program to address the highest priority fish

passage projects on the state highway system. In addition, ODOT funded two transportation liaison positions within ODFW, to coordinate the agreement's implementation and develop a database of ODOT culverts that includes fish presence, passage information, and a prioritization model.

The CRPA agreement is a crucial tool allowing ODOT to make meaningful progress in addressing culvert infrastructure problems, while demonstrating a benefit to NMF. ODOT and ODFW have measured success by documenting the number and cost of culverts repaired under this agreement, as well as the benefits of incremental fish passage improvements provided at the repair sites. Additionally, NMF gain major benefits through off-highway high-priority fish passage compensation fund projects.

The rules, laws, and other reference material regarding NMF passage regulations can be found below:

- [Oregon Fish Passage Rules.](#)
- [Oregon Plan for Salmon and Watersheds.](#)
- [Oregon Fish Passage Statues.](#)

Programmatic Goals

The CRPA included several key goals and sideboards for ODOT to conduct the culvert repair pilot program.

The goals of the CRPA included:

- a) Provide improved fish passage conditions at each culvert repair site.
- b) Address statewide fish passage priority barriers using the \$2 million fish passage fund in the most expeditious and efficient way practical.
- c) Improve state highway infrastructure conditions at each culvert repair site to address public safety.
- d) Generate information on the costs, impacts, efficiency, and effectiveness of the CRPA project approach.
- e) Develop a work plan to further identify resources and gather information on fish presence and barriers.

Programmatic Sideboards

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

- Culverts must have been located on ODOT-owned or operated stream crossings, anywhere in the state.
- Culvert repairs may provide (up to) an additional 25 years of culvert life.
- Repaired culverts must include fish passage improvements.
- Culverts can be rated as a high priority for fish passage, as determined by ODFW, provided all feasible passage improvements are conducted at the site.
- Culverts that provide access to Habitat Category 1 and tide gates were excluded. OAR 635-415-0025 (1) defines Category 1 Habitat and includes habitat that is irreplaceable, essential habitat for a fish or wildlife species, population, or unique assemblages of species.
- Slip lining was excluded from repair options.
- Culverts with tide gates were excluded.

Note: Culverts that are not within current or historic NMF habitat are not subject to fish passage laws and regulations and may be repaired outside of this agreement. In addition, ODOT may choose to implement full ODFW criteria fish passage or use the existing exemption or waiver process for fish passage for culvert repair or replacement outside the CRPA.


Purpose and Need

Figure 1: Repair and Replacement Costs vs Funding Summary

Description: Image summarizes typical culvert repair costs, typical replacement costs meeting fish passage criteria, and the resulting deferral.

Repair and Replacement Costs vs Funding

- Typical culvert repairs: \$50 K– \$250 K
- Typical culverts replaced to meet fish passage criteria: \$1.5M to \$12M
- Resulting in deferred repair and replacement



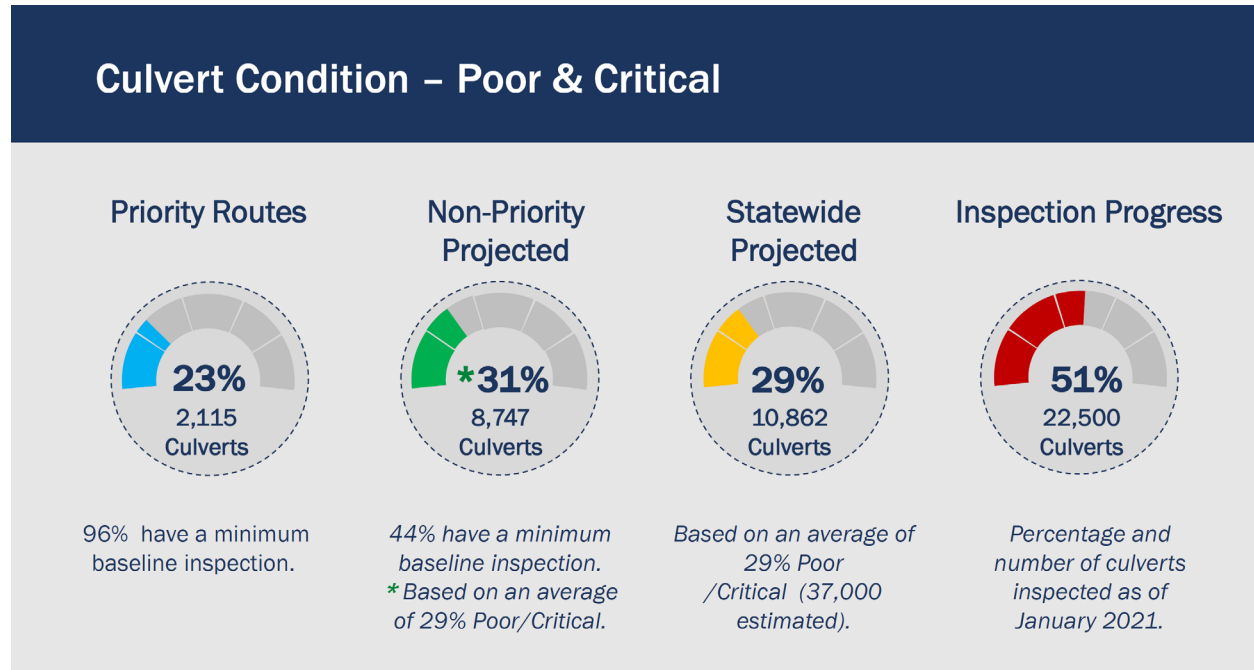
Culvert Inventory

There are approximately 35,000 culverts under the state highway system; most were installed prior to 1970 and are nearing the end of their design life. ODOT began developing systematic information on culvert infrastructure and condition in 2013. ODOT has completed culvert inventory on 51 percent of the state highway system, including all the Highway Management Team’s priority routes. Priority routes are the most important highways for freight movement, connectivity with major population centers, and emergency response.

The culvert inventory estimated approximately 29 percent, or roughly 10,862, of ODOT’s culverts are in poor or critical condition and need to be repaired or replaced in the near term to maintain the safety and integrity of the state highway system (Figure 2). The cost to replace all these culverts in kind would be well over \$18 billion. This cost would be substantially higher for the installation of larger culverts or bridges to meet fish passage criteria.

Figure 2: Culvert Inventory and Condition Summary

Description: Image summarizes culvert Inspection Progress and gives metrics for percentage estimates for poor and critical condition.



Declining Transportation Funds

As the increased need for culvert repair and replacement is coming to light, federal funds for highway projects have been drastically reduced. The ODOT Culvert Program receives \$12 million annually for culvert replacements. Based on current costs, it would require over \$18.5 billion to replace all the culverts under the state highway network. The typical design life of a culvert can range from 25 to 75 years. Based on current funding allocations, it would take over 1,500 years to replace all the culverts owned and managed by ODOT. Even with a new infusion of transportation funds from Oregon House Bill 2017, the need to be efficient with funding requires creative approaches for managing Oregon’s culvert infrastructure.

Fish Passage Rules and ODOT’s Fish Passage Program

Oregon’s fish passage law was updated in 2001. This law and the implementing regulations (OAR 635-412-0005(9) a-d) require ODOT to address fish passage whenever there is new construction, replacement, or major repair of a culvert in habitat currently or historically

occupied by NMF. To meet fish passage design criteria, most existing culverts need to be replaced with much larger culverts or bridges.

ODOT has a proven record of enhancing fish passage and contributing to the Oregon Plan for Salmon and Watersheds. ODOT's Fish Passage Program will continue to reopen access to salmon habitat by installing large culverts and bridges in locations ODFW identifies as high priorities for fish passage. From 1997-2022, ODOT completed 157 voluntary fish passage projects and improved access to over 535 miles of NMF habitat. This is a voluntary investment in fish passage, because these projects were not completed due to a trigger event, an action such as construction which requires that fish passage be provided, or other regulatory requirements. ODOT continues to be committed to addressing high priority fish passage barriers on the state highway system, and as part of the CRPA agreement, has dedicated at least \$4.2 million annually towards these projects.

The OR 99W Coleman Creek Culvert Replacement Project, Figure 3, completed by the ODOT Fish Passage Program, is one example of ODOT's commitment to improving fish passage and supporting the Oregon Plan for Salmon and Watersheds. The project replaced an undersized 4-foot by 6-foot concrete box culvert with a 46-foot-long bridge. The original culvert was undersized for the stream channel, causing channel scour and incision. The culvert also had a large perch at the outlet, which resulted in a significant passage barrier for both adult and juvenile NMF. The Coleman Creek fish passage project opened access to over 4 potential miles of high-quality spawning and rearing habitat for summer and winter steelhead, fall Chinook salmon, cutthroat trout, and lamprey species at a cost of \$5.3 million.

Figure 3: OR 99W Coleman Creek Culvert Replacement Project, Before and After

Description: The top panel of two photos shows Coleman Creek before the replacement. The photo shows the original culvert outlet with large perch, creating a fish passage barrier. The bottom photo is after the culvert replacement, showing a new 46-foot long bridge with the reconstructed stream channel under it.



CRPA Process and Timelines

As a condition of the CRPA agreement, the agencies developed a streamlined project timeline. Construction of culvert repair needs to coincide with regulated in-water work periods (IWWP), which usually occur during low flow summer months. The timelines developed allow for full opportunity to scope potential projects, conduct site visits, develop plans, and allow for contracting processes.

- February 28, the year before construction (> 16 months from target IWWP): ODOT provides a list of potential CRPA projects to ODFW for review. ODFW conducts desk scoping for species and life history designations.
- June 1, the year before construction (12-13 months to IWWP): ODFW reviews and approves the draft list based on criteria of agreement, including.
 - a. NMF species historically and currently present.
 - b. Migratory timeframes of concern.
 - c. Existing fish passage impediments.
 - d. Recommendations to improve fish passage conditions.
 - e. Recommended in-water work window.

- October 1, the year before construction (10 months to IWWP): ODFW and ODOT staffs conduct site visits to all potential projects. During these site visits, ODOT and ODFW collaboratively develop culvert repair and fish passage improvements for each site. Team members base the design plan on site conditions and constraints, hydraulic conditions, and the needs of NMF. Site visit summary forms are filled out and signed by both agencies, helping to guide design.
- February 28, the year of construction: (5 months to IWWP): ODOT provides culvert repair and fish passage design concepts to ODFW for review and comment. If Endangered Species Act (ESA) species are present, designs are also sent to the National Marine Fisheries Service (NMFS) for review and approval. As a culvert repair project, NMFS engineers review each design with ESA listed fish species to ensure that the projects result in better passage conditions following implementation.
- March 31, year of construction (3-4 months to IWWP): ODFW (and or NMFS) reviews each incremental passage design and documents concurrence with the design approach.
- [Construction during IWWP](#): Projects constructed with oversight by ODOT and ODFW staff.
- Post-construction: Projects are continually monitored at 1, 3, and 5-year increments, usually following high flow events, by ODOT and ODFW staff to ensure that fish passage improvements are functioning as designed. If fish passage improvements do not function as intended, then ODOT and ODFW collaborate on an approach to fix fish passage elements during the next available IWWP or as approved by regulatory agencies.

A discussion on these timelines is provided under the lessons learned section of this report.

ODOT Major Culvert Maintenance Engineer

In 2018, the Geo-Environmental section of ODOT designated the Major Culvert Maintenance (MCM) Program to oversee culvert repairs across the state. A senior culvert maintenance hydraulic engineer manages the MCM program, which helps identify potential projects, recommends appropriate repair actions, and funds culvert retrofit projects. The program also guides engineers and designers specific to the CRPA agreement and works closely with the ODOT Fish Passage and Culvert Fix It programs. Due to the addition of this position, ODOT was able to identify and address timesaving and efficiency-increasing procedural processes. This led to the creation and implementation of new CRPA initiation forms for scoping, design and submittals, and the creation of a quality assurance and review process for submittals. These forms and procedures were developed and tested in 2018 with full implementation beginning in 2019.

2018 - 2022 Culvert Repair Projects

This CRPA pilot final report includes a high-level overview of cost and fish passage improvements at culvert repair locations. Under this agreement, 40 culverts were repaired through 36 projects. Further detail for each project can be found in the corresponding annual reports, available online at the ODOT Fish Passage Program [homepage](#), or by contacting Allen Gillette, ODOT Fish Passage Program lead at 503-871-7192.

Further information into the ODOT provided compensation funds administered by ODFW can be obtained through the ODFW 2018 – 2022 Culvert Repair Programmatic Final report, or by contacting the ODOT / ODFW Fish Passage Liaison at 541-579-5263.

Figure 4: Locations of CRPA Projects that Were Constructed from 2018- 2022.

Description: Map of Oregon showing the locations of the three CRPA projects discussed in the report.

Completed CRPA Projects 2018-2022

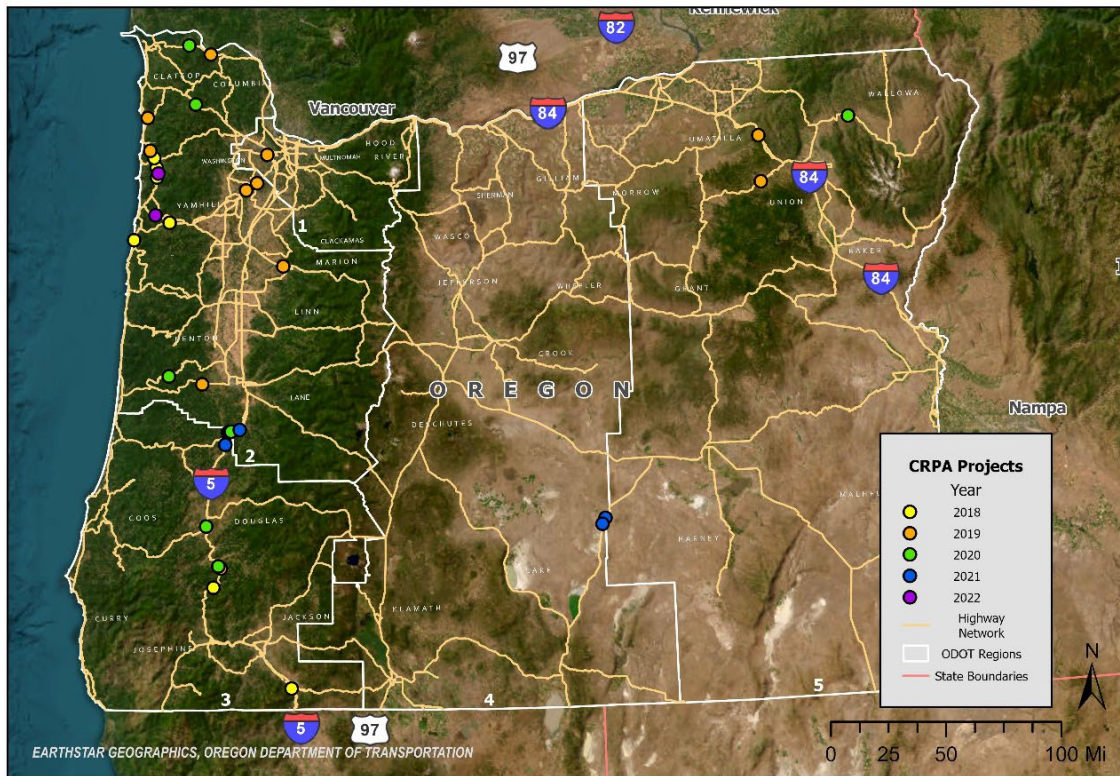


Table 1. 2018-2022 Average Culvert Repair Analysis

Description: Table depicts the year, full replacement cost (approximate), repair cost, estimated cost differential, and max potential NMF habitat miles.

Year	Full Replacement Costs (approximate)	Repair Cost	Estimated Cost Differential	Max Potential NMF Habitat Miles	Number of Projects
2018	\$11,605,000	\$998,400	\$10,606,600	18.3	8
2019	\$34,712,000	\$2,734,000	\$31,978,000	47.51	12
2020	\$35,881,000	\$1,613,372	\$34,267,628	29.37	8
2021	\$23,400,000	\$850,540	\$22,549,460	19.34	5
2022	\$5,800,000	\$604,000	\$5,196,000	6.22	3
Overall	\$111,398,000	\$6,800,312	\$104,597,688	120.74	36

Culvert Cost Analysis and Repair Summary

The cost to repair 40 culverts under this agreement was \$6,800,312. The estimated cost to replace these culverts was \$111,398,000. Through the CRPA, ODOT deferred costs of **over \$104 million** to replace these culverts, see Table 1. This cost deferment should be evaluated relative to the design life provided by the approach. The repairs have added approximately 10-25 years of life to these culverts, whereas full replacements would have provided a new design life of 75+ years. However, even given the difference in life span for the two approaches, life cycle costs are much lower for the repair option.

The 2018 - 2022 culvert projects were repaired using several different techniques:

- Twenty projects used an invert pave to add a layer of reinforced concrete in the bottom of the culvert to seal the invert, keep water in the culvert barrel, and provide a connection to complete the culvert circumference, thereby repairing the structural capacity of the pipe.
- Nine of the projects used a cured-in-place liner (CIPP) that adds a new continuous layer around the circumference of the culvert, resulting in restored structural capacity. The CIPP seals the entirety of the pipe, keeping water inside the barrel and the structurally compacted soil outside the culvert intact.

- Three projects used a centrifugal cast concrete. This approach seals the entire perimeter of the culvert, retaining flows and resorting structural integrity to the circumference of the barrel.
- Several of these projects included use of grout to seal holes and gaps in the barrel.
- Three of these projects included repairing more than one culvert in a single project, such as the Mountain Creek project in 2021, where three culvert barrels carried the creek under US 395.

A full list of the individual culvert repairs is available in Appendix 1: 2018 - 2022 Culvert Repair Cost Analysis

Fish Passage Improvements Summary

The 2018 - 2022 CRPA Pilot projects used multiple fish passage improvement techniques during construction. Appendix 5 summarizes the fish passage improvements at each project location. All of these techniques were used to buffer high water velocities, provide resting and variable flow conditions in the culvert, and provide more water depth during low flow to facilitate passage. In locations where the culvert outlets were perched, channel work was completed downstream to alleviate jump heights into the culvert. In one location, the highway culvert did not have conditions to improve for fish passage, so a downstream barrier (road crossing), was replaced to better facilitate fish passage. Through all these improvements, 125.63 miles of habitat was made more accessible to NMF.

A full list of the individual fish passage improvements is available in Appendix 2 Fish Passage Improvement Analysis

Project Descriptions

This CRPA pilot final report includes a high-level overview of cost and fish passage improvements at culvert repair locations. Further detailed project descriptions can be found in the corresponding annual reports, available online at the ODOT Fish Passage Program homepage, or by contacting Allen Gillette, ODOT Fish Passage Program lead at 503-871-7192.

Further information into the ODOT provided compensation fund projects administered by ODFW can be obtained through the ODFW 2018 – 2022 Culvert Repair Programmatic Final report, or by contacting the ODOT / ODFW Fish Passage Liaison at 541-579-5263.

Improvements to the Infrastructure Condition

Under this agreement, ODOT was able to make short term repairs to 40 culverts in poor and critical condition. When comparing individual repair versus replacement costs, state sourced dollars were stretched to maximize the number of locations that could be repaired, reducing the number of potential culvert failures, and helping to keep highways open.

Compared to the over 10,500 culverts rated in poor or critical condition across the state, the 40 repairs are a small fraction of the overall infrastructure problem. With an estimated replacement cost of over \$18 Billion to bring these all these assets into a fair or better condition, a significant investment needs to be made to address the current condition state. Recently reduced funding cycles and inflating costs only exacerbate this issue. State and Federal legislative funding dedicated to existing infrastructure maintenance and operations can help move the needle on a region wide problem. In the meantime, the approach of short-term repairs for minimal investment is one important way to keep the traveling public safe, and our highways open.

Monitoring Strategy and Adaptive Management

ODFW and ODOT developed a monitoring strategy that evaluates fish passage performance at each of the repaired culverts. Monitoring documents pre-project conditions, post-project conditions, and initial evaluation of fish passage improvements. As part of the CRPA agreement, monitoring is completed post-construction in years 1, 3, and 5 after winter and spring channel-forming high flow events. This ensures that projects are functioning as intended. These project specific reports can be made available by contacting Allen Gillette, ODOT Fish Passage Program lead at 503-871-7192.

ODOT is responsible for ongoing maintenance to ensure the improved passage continues to function at all CRPA sites. However, once monitoring deems the fish passage improvement at a culvert is successful, assessments are less frequent. From 2018 - 2022, monitoring involved an ODFW liaison and the ODOT aquatic resources lead visiting each CRPA at least twice a year during different flows to determine if the CRPA project is successful, or in need of modifications. When monitoring has revealed a site where fish passage improvements do not meet the designed standard, additional work was planned to bring the site into compliance. ODOT is currently developing a standardized monitoring form to aid in tracking and reporting the results of each repair.

Lessons Learned

Several opportunities to improve the implementation of the 2018 – 2022 CRPA Pilot were apparent and are discussed below.

Information Management

Scoping and identifying projects for the CRPA each year is challenging and takes extensive amounts of time. ODOT's culvert inventory is unfortunately incomplete and does not contain substantial information on fish presence or habitat availability for all culverts on the highway system. Due to this information gap, field visits with ODFW and ODOT biologists are required to make final determinations regarding fish presence at each proposed repair location. With a more complete data set, identification and selection of repair projects could be accomplished more efficiently.

Out of Barrel Treatments

Several projects completed under this agreement included out of barrel treatments to improve fish passage. In the past, out of barrel treatments using rock weirs or a roughened channel were difficult to install due to right of way needs, and some of these projects were not installed as designed or directed.

To address challenges with working off the ODOT right of way, projects with out of barrel treatments developed under this agreement started the right of way process much earlier in project development. This allowed for negotiations with landowners and acquisition of easements well in advance of construction windows. This also allowed for more flexibility by the contractor for installation and maintenance of temporary water management facilities, which commonly are located off of the highway right of way. Overall, starting the right of way access process much earlier in project development was a valuable lesson learned, and will continue to be incorporated into future projects.

To address previous issues with construction of rock weirs and roughened riffles, the Major Culvert Maintenance Program and Region Technical Delivery Centers dedicated engineering staff to help oversee construction. This resulted in projects getting installed as per specification and approved design. Questions from contractors regarding steps in placing bed material, sizing, and other sequencing could be answered real time, and projects that utilized roughened riffles were a success. In the future, resourcing an engineer for construction oversight of out of barrel work is essential for project success.

In-Barrel Treatments

Many of the CRPA projects implemented under this agreement included in-barrel treatments for fish passage improvements. Treatments included corner baffles, flexible baffles, and fish rocks or blocks. All in-barrel treatments were effective at improving fish passage. Lessons learned about in-barrel treatments include:

- Fish blocks need to be inspected before installed to ensure they are sized to match the approved design specifications.
- Early engineering phases need to consider hydraulic capacity when proposing in barrel treatments as fish passage improvements. Some projects initially scoped for construction did not have capacity for in barrel treatments, and were discouraged from using the agreement as no other fish passage improvements could be made at the site.

Pre-project Meeting with the Contractor

Early and often coordination between agency staff and contractors has shown to help the project delivery process. This can include a pre-construction meeting between the agencies and selected contractor to discuss plans for:

- Temporary water management.
- Fish salvage timing.
- Equipment staging.
- Site-specific constraints.
- Project area access.
- Materials needed, as described in the specifications.

This meeting allows the contractor to ask site-specific questions and develop a detailed plan with ODOT construction personnel prior to work beginning.

Hydraulic Modeling

As part of engineering design for culvert improvements, culvert capacity and channel scour are evaluated for the proposed repair to ensure the site is suitable for in and out of barrel treatments. CRPA projects can benefit from advanced hydraulic modeling including fish passage conditions. Due to advanced hydraulic modeling not being available for all projects, documentation of water velocities was not available for some locations. In turn, these projects lacked numeric evidence that velocity was a fish passage issue, and that it was improved after repair. When advanced hydraulic modeling is completed for both pre and post repair conditions, ODOT and ODFW can ensure that there is capacity for in-barrel treatments, along with

documenting what flow conditions are an issue for fish passage and will be improved with proposed treatment.

Timelines

Overall, the timelines identified in the CRPA agreement streamlines project development and delivery compared to full culvert replacement projects. On some projects, the timelines have been more difficult to meet, and are usually associated with sites requiring extended time for scoping, right of way, engineering, and planning.

Desk and field scoping of potential projects continues to become more efficient as ODOT region and statewide staff become more familiar with the sideboards of the agreement. Engineering guidance has been developed specific to these types of culvert retrofits, and overall design timelines have improved. For projects that do not require right of way easements or purchase, utility relocation, or other work outside of the culvert barrel, this timeline has been found to be effective in streamlining coordination and project delivery.

A few projects were delayed outside of the timeline specified in the agreement. Federally funded corridor projects, some with over 100 culverts, take much longer to scope and design compared to single culvert projects. Projects requiring right of way for channel work or access for temporary water management can be delayed up to a year or more. Federal permitting processes can also delay design and approval due to increased review and turnaround times. And some repair approaches, such as centrifugal cast concrete, require special equipment and knowledge to install, leading to limited or no bids during the public bidding process. Culvert emergency repairs typically do not allow for full scoping and or design based on the need to implement the project for public safety reasons.

As more projects are completed under the CRPA, ODOT and ODFW staff are finding more ways to line up the timelines of the agreement to federally funded corridor projects. Projects potentially requiring right of way, utility, or federal permitting coordination are identified early in the desk and field scoping process, allowing for extended timelines, and planning. More contractors are bidding on culvert repair projects as technologies and construction approaches become more prevalent in the contracting field. This timeline should be revisited in future agreements; however, overall, it has been found to be effective in streamlined project development and delivery.

Outreach

The majority of CRPA projects completed under this agreement came from ODOT Regions 2 and 3. While this is partly attributed to a higher density of culverts and fish bearing streams on the

West side of the state, this could also be a factor of time. The first CRPA Pilot, in place from 2014 – 2017, was only eligible for projects west of the Cascade Mountain Range. While the 2018 – 2022 Pilot was eligible for projects statewide, Regions 2 and 3 had more experience with scoping and implementing projects compared to other areas of the state. As more Region staff are learning and implementing the new CRPA agreement, it is anticipated that projects will be identified throughout the state on a more regular occurrence.

Additional outreach efforts from both ODOT and ODFW can help highlight the unique and successful approaches of this partnership. Future repair agreements will need support from both agencies, and outreach targeting the cost efficiency and benefits to NMF can help inform future funding and staffing needs. Likewise, outreach efforts showcasing the agreement to the general public can help provide transparency into the effort to maintain the state highway system in an ecologically and fiscally responsible manner.

Conclusion

The 2018 – 2022 CRPA Pilot Agreement continued to be a valuable method of extending the working life of failing and degraded culverts on ODOTs highway infrastructure, while providing enhanced passage for NMF.

Cost avoidance of over \$104 million dollars was realized through the ability to fix culverts under a streamlined programmatic process. Access to over 120 miles of habitat were enhanced for NMF at culvert enhancement locations, and access to over 560 miles of habitat was improved off the highway network through ODOT provided Compensation Funds.

Continued monitoring and reporting on the success of the CRPA program will inform future adaptations and program development. The agreement demonstrates successful interagency cooperation in maintaining the highway system for the traveling public, saving taxpayer dollars, and improving access to critical habitat for NMF.

Culvert Repair Programmatic Agreement Pilot

2018 - 2022 Final Report

Appendix 1: 2018 - 2022 Culvert Repair Cost Analysis

Description: Table depicts the year, stream and location, type of repair, the approximate cost of a full replacement, and cost of repair

Year	Stream Name	Hwy and MP	Repair	Replacement Cost	Repair Cost
2018	Trib. To Pheasant Creek	OR-18, 16.03	Cured-in-Place Pipe Liner	\$1,100,000	\$40,000
2018	Pass Creek	I-5, 165.97	Invert Pave	\$3,300,000	\$217,000
2018	Pass Creek	I-5, 166.69	Invert Pave	\$2,500,000	\$163,000
2018	Trib. To Cow Creek	I-5, 84.91	Cured-in-Place Pipe Liner	\$1,800,000	\$223,000
2018	Trib. to Tillamook River	US 101, 69.48	Invert Pave	\$750,000	\$63,500
2018	Trib. to Tillamook River	US 101, 74.78	Invert Pave	\$850,000	\$90,700
2018	Tandy Creek	US 30, 65.46	Centrifuge Cast Concrete	\$805,000	\$134,100
2018	Baldy Creek	US 101, 116.35	Centrifuge Cast Concrete	\$500,000	\$67,100
2019	Johnston Creek	OR 8, 4.97	Invert Pave	\$5,500,000	\$903,000
2019	Unnamed Tributary to Mud Slough	OR 22, 18.48	CCCP	\$3,500,000	\$98,000
2019	Unnamed Tributary to Westport Slough	US 30, 68.7	CIPP	\$912,000	\$22,000
2019	Spring Brook Creek	OR 99W, 20.85	Grout and CCCP	\$3,000,000	\$77,000
2019	Unnamed Tributary to Hess Creek	OR 99W, 26.91	CIPP	\$4,100,000	\$70,000
2019	Long Tom River Floodplain Lake	OR 126, 44.17	CCCP	\$1,200,000	\$77,000
2019	Unnamed Tributary to Doty Creek	US 101, 61.46	CCCP	\$1,300,000	\$55,000
2019	Unnamed Tributary to Alder Creek	US 101, 44.43	Invert Pave	\$1,300,000	\$55,000
2019	Canyon Creek	I-5, 95.07	Invert Pave	\$1,400,000	\$267,000

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Year	Stream Name	Hwy and MP	Repair	Replacement Cost	Repair Cost
2019	Pass Creek	I-5, 167.04	Invert Pave	\$4,300,000	\$200,000
2019	Marley Creek	OR 244, 31.03	Invert Pave	\$3,000,000	\$800,000
2019	Two Mile Creek	I-84, 236.31	Replace inlet & invert pave	\$5,200,000	\$110,000
2020	Unnamed Tributary to Roberts Creek	I-5, 119.88	Invert Pave	\$6,500,000	\$290,000
2020	Pass Creek	I-5, 167.17	Invert Pave	\$5,750,000	\$280,000
2020	Canyon Creek	I-5, 96.82	Fill voids	\$10,000,000	\$165,372
2020	Unnamed Tributary to Wallowa River	OR 82, 39.47	Cast Concrete	\$850,000	\$95,000
2020	Rock Creek	US 26, 27.85	Invert Pave	\$6,100,000	\$285,000
2020	Supply Creek	US 30, 79.72	Invert Pave	\$5,500,000	\$288,000
2020	Almasie Creek	OR 36, 16.41	Invert Pave	\$725,000	\$60,000
2020	Unnamed Tributary to South Fork Coquille River	OR 542, 8.7	CIPP Liner	\$456,000	\$150,000
2021	Lane Creek	I-5, 171.47	Invert Pave	\$7,500,000	\$186,775
2021	Anlauf Creek	I-5, 159.29	Invert Pave	\$12,000,000	\$233,801
2021	Thief Creek	I-5, 159.17	Invert Pave	\$2,100,000	\$155,867
2021	Bridge Creek	US 395, 35.83	SAPL Liner	\$900,000	\$164,458
2021	Mountain Creek	US 395, 38.91	SAPL Liner	\$900,000	\$109,639
2022	Small Creek	OR 130, 7.4	Invert Pave	\$1,200,000	\$145,000
2022	Munson Creek	US 101, 72.42	Invert Pave	\$2,800,000	\$175,000
2022	Unnamed Tributary of the South Fork Coquille River	OR 42, 22.35	CIPP Liner	\$1,800,000	\$284,000

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Appendix 2: 2018 - 2022 Fish Passage Improvement Analysis

Description: Table depicts the stream and location, the potential miles of habitat to end of fish use or next full barrier upstream, and the fish passage improvement

Year	Stream Name	Hwy and MP	Maximum Potential NMF Habitat Miles	Passage Improvement
2018	Trib. To Pheasant Creek	OR-18, 16.03	8.9	Slopped Weirs
2018	Pass Creek	I-5, 165.97	3.67	Fish Blocks and Downstream Weir
2018	Pass Creek	I-5, 166.69	0.2	Plastic Baffles
2018	Trib. To Cow Creek	I-5, 84.91	0.2	Baffles
2018	Trib. to Tillamook River	US 101, 69.48	1.79	Fish Rocks
2018	Trib. to Tillamook River	US 101, 74.78	0.27	Fish Rocks
2018	Tandy Creek	US 30, 65.46	0.65	Fish Rocks
2018	Baldy Creek	US 101, 116.35	2.62	Downstream Boulder Weir
2019	Johnston Creek	OR 8, 4.97	4.92	Fish Rocks
2019	Unnamed Tributary to Mud Slough	OR 22, 18.48	5.05	Fish Rocks
2019	Unnamed Tributary to Westport Slough	US 30, 68.7	1.55 Acres	Boulder receiving pool
2019	Spring Brook Creek	OR 99W, 20.85	0.14	Replacing undersized downstream culvert
2019	Unnamed Tributary to Hess Creek	OR 99W, 26.91	0.2	Boulder weir
2019	Long Tom River Floodplain Lake	OR 126, 44.17	0.75	Fish Rocks
2019	Unnamed Tributary to Doty Creek	US 101, 61.46	3.05	Fish Rocks
2019	Unnamed Tributary to Alder Creek	US 101, 44.43	6.9	Fish Rocks

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Year	Stream Name	Hwy and MP	Maximum Potential NMF Habitat Miles	Passage Improvement
2019	Canyon Creek	I-5, 95.07	15.15	Fish rocks and roughened channel
2019	Pass Creek	I-5, 167.04	3.5	Fish Rocks
2019	Marley Creek	OR 244, 31.03	5.89	Baffles and channel modification
2019	Two Mile Creek	I-84, 236.31	1.96	Fish baffles
2020	Unnamed Tributary to Roberts Creek	I-5, 119.88	0.7	Baffles
2020	Pass Creek	I-5, 167.17	1.96	Fish Blocks
2020	Canyon Creek	I-5, 96.82	13.14	Fish Blocks
2020	Unnamed Tributary to Wallowa River	OR 82, 39.47	0.55	Concrete weirs
2020	Rock Creek	US 26, 27.85	6.48	Baffles and Downstream roughened riffle
2020	Supply Creek	US 30, 79.72	3.66	Boulder Weirs and Corner Baffles
2020	Almasie Creek	OR 36, 16.41	2.01	Fish Rocks
2020	Unnamed Tributary to South Fork Coquille River	OR 542, 8.7	0.87	Flexible Baffles and Channel Rebuild
2021	Lane Creek	I-5, 171.47	2.9	Baffles
2021	Anlauf Creek	I-5, 159.29	0.26	Baffles
2021	Thief Creek	I-5, 159.17	3.73	Baffles and root wads
2021	Bridge Creek	US 395, 35.83	8.42	Baffles and Blocks
2021	Mountain Creek	US 395, 38.91	4.03	Baffles and Blocks
2022	Small Creek	OR 130, 7.4	0.93	Baffles and channel work

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Year	Stream Name	Hwy and MP	Maximum Potential NMF Habitat Miles	Passage Improvement
2022	Munson Creek	US 101, 72.42	4.73	Baffles and channel work
2022	Unnamed Tributary of the South Fork Coquille River	OR 42, 22.35	0.56	Fish blocks

Appendix 3: 2018 – 2022 ODOT / ODFW Culvert Repair Programmatic Agreement

**ODOT CULVERT REPAIR
PROGRAMMATIC AGREEMENT PILOT PROJECT
Final 12-8-2017**

The parties to this Programmatic Agreement, (hereafter "Agreement") are the Oregon Department of Fish and Wildlife (ODFW), and the Oregon Department of Transportation (ODOT), both agencies of the State of Oregon.

I. PURPOSE

1. It is the policy of the State of Oregon to provide for upstream and downstream passage for native migratory fish in all waters of this state in which they are currently or have historically been present, as described in Oregon Revised Statute (ORS) 509.585, Oregon Administrative Rule (OAR) 635-412-0020, and envisioned by the Oregon Plan for Salmon and Watersheds (Executive Order 99-01).
2. It is the Mission of ODOT to provide a safe, efficient transportation system that supports economic opportunity and livable communities for Oregonians.
3. Pursuant to ORS 509.585 and OAR 635-412-0020, certain actions, or "trigger events,"¹ at "artificial obstructions"² where native migratory fish (as defined in OAR 635-412-0005(32)) are currently or were historically present require the review and approval of fish passage by ODFW or the Oregon Fish and Wildlife Commission (OFWC) prior to those trigger events occurring. OAR 635-412-0020(3)(b) allows ODFW to grant "programmatic approval" of a fish passage plan for multiple artificial obstructions of the same type.
4. ODOT owns and operates a number of culverts as part of its transportation system. ODOT desires the opportunity to conduct repair activities on their culverts to meet the original life expectancy of the culvert structure. These activities (Appendix A) may constitute a fish passage trigger event as defined by OAR 635-412-0005(9).
5. This Agreement is intended to serve as the ODFW fish passage approval for the short-term repairs of ODOT culverts associated with this pilot project that meet the requirements and conditions of this Agreement (including Appendix A).
6. The goals of this Agreement include:
 - a) Provide improved fish passage conditions at each culvert repair site
 - b) Address statewide fish passage priority barriers using the fish passage fund (defined in Section III(3) of this agreement) in the most expeditious and efficient way practical
 - c) Improve State highway infrastructure conditions at each culvert repair site to address public safety
 - d) Generate information on the costs, impacts, efficiency, and effectiveness of the culvert repair pilot project approach
 - e) ODOT and ODFW will develop a work plan and identify resources to develop information on fish presence and barrier status on the State highway system and include this information in the ODOT State Highway Drainage Facility Management System (DFMS)

¹ "Trigger events" for the purposes of this Agreement shall mean, with respect to an "artificial obstruction" (defined in OAR 635-412-0005(3)) located where native migratory fish are currently or were historically present: "construction" activities (defined in OAR 635-412-0005(9)), "fundamental changes in permit status" (defined in OAR 635-412-0005(25)), or "abandonment".

² "Artificial obstruction" means any dam, diversion, dike, berm, levee, tide or flood gate, road, culvert or other human-made device placed in the waters of this state that precludes or prevents the migration of native migratory fish.

II. APPLICABILITY

1. This Agreement applies to ODOT, including its independent contractors, when repairing ODOT owned culverts. It does not apply to other State or local agencies, or private persons.
2. This Agreement applies when ODOT culvert repair actions covered by this pilot project constitute a "trigger event" to Oregon's Fish Passage Policy. The Agreement identifies and determines how ODOT shall proceed as per the terms of this Agreement. ODOT remains responsible to address and comply with fish passage laws for activities and situations not covered by this Agreement.
3. Under this Agreement only ODFW may determine that native migratory fish are not currently and were not historically present at a site; however ODOT may assume presence of native migratory fish.
4. This Agreement applies to culverts that meet all of the following criteria:
 - a) Culverts located within the State of Oregon;
 - b) Culverts not identified on the ODOT ten year passage implementation plan.³
 - c) Culverts located in or which would prevent access to Habitat Category 1⁴ habitat are excluded.
 - d) Culverts with tide gates are excluded.
 - e) Full traditional culvert slip-line repair treatments are excluded.

III. PROVISIONS OF THE AGREEMENT

1. ODOT will be permitted to conduct the culvert repair activities described in appendix A through the 5-year term of this Agreement. Culvert replacements are not authorized by this Agreement.
2. ODOT will ensure that fish passage improvements⁵ occur at each culvert repaired under this Agreement, with the goal of maximizing native migratory fish passage to the extent feasible at each site. Culverts identified as a high fish passage priority on the current ODFW-ODOT Culvert Fish Passage Priority list are eligible for repair under this programmatic provided that fish passage is significantly⁶ improved as part of the repair project.

³ ODFW and ODOT will jointly develop a 10 year passage implementation plan for ODOT to address fish passage at High Priority sites utilizing the ODOT Fish Passage Program funds. Projects not identified on this implementation plan are eligible for the Culvert Repair Programmatic Agreement.

⁴ Habitat Category I is defined in OAR 635-415-0025(1) and include habitats that are irreplaceable, essential habitat for a fish or wildlife species, population, or a unique assemblage of species and is limited on either a physiographic province or site specific basis, depending on the individual species, population or unique assemblage.

⁵ Fish passage improvements may include but are not limited to the following treatments: weirs, baffles, fish rocks, roughened channels, rock weirs, or other treatments within or outside the culvert that decrease water velocities, increase water depths, or reduce jump heights. ODFW-ODOT Liaison will work with ODOT to ensure site specific fish passage improvements are appropriate for the fish species and site conditions. If fish passage exists and cannot be further improved at ODOT's culvert repair site, fish passage improvements may occur at the next passage barrier up or downstream of ODOT's culvert as negotiated on a case by case basis. The goal of addressing passage up or down stream of ODOT's culvert is to ensure that a cumulative net benefit is realized by the fish population at the trigger site.

⁶ For High Priority Fish Passage Barriers ODOT will address everything possible and necessary at the project site to improve fish passage without replacing the structure itself. This includes improving outlet conditions (where applicable) to address jump height into the culvert and/or provide a backwater condition at the culvert outlet.

3. ODOT will provide ODFW fish passage restoration funds to offset the delay in full fish passage at the repair culverts as a result of this Agreement. This passage restoration fund account will be funded with \$2 million dollars at the beginning of the agreement to offset the delay in passage for the first 40 culverts repaired under the agreement. For each culvert repaired after the first 40, ODOT will contribute an additional \$50,000 dollars to the fund. ODOT anticipates repairing approximately 20 culverts each year under the five year agreement for a projected total of 100 culverts repaired and \$5 million dollars of restoration funding.
4. ODFW will manage and administer these funds to specifically address high priority fish passage projects statewide regardless of ODOT ownership and independent of geographic location. ODFW will use generally accepted accounting practices to manage these funds and shall ensure these funds are allocated in the most expeditious and cost effective means while maximizing benefit to native migratory fish.
5. ODOT will continue to fund at least \$4.2 million annually into the ODOT Fish Passage Program for the term of this agreement. This funding is separate and in addition to the ODFW fish passage restoration funds described in section III (3) and funding for the liaisons described in section III (8) of this agreement. The ODOT Fish Passage Program funding will be used to address the ten year passage implementation plan administered by ODOT.
6. During the year prior to the target year for proposed culvert repairs: By February 28th (typically 16 months in advance of the target in-water work window), ODOT will provide ODFW a list of potential culverts to be repaired during the following year's in-water work period under the terms of this Agreement for each year of the Agreement. ODFW will review and approve the list based on criteria in Section II.4.a-e above, by June 1st, or within 90 days of receiving the list. By October 1st ODFW will provide ODOT with the following information for each potential repair project at the repair site:
 - a) Native Migratory Fish Species historically and currently present
 - b) Migratory timeframes of concern
 - c) Existing fish passage impediments
 - d) Recommendations to improve fish passage conditions
 - e) Recommended in-water work window
7. ODOT and ODFW will collaboratively develop fish passage improvements for each repair site, based on site conditions and constraints, hydraulic conditions, and the needs of Native Migratory Fish. ODOT will provide fish passage design concepts to ODFW for review and comment by February 28th of the year of proposed culvert repairs. ODFW will review each incremental passage design and document concurrence with the design approach by March 31st, or within a month of receiving the fish passage design concepts.
8. ODOT will fund two ODFW/ODOT Liaison positions to help implement this Agreement.
9. Culvert repair actions not authorized by this Agreement require specific approval by ODFW if the repair actions meet the trigger definition. This Agreement does not preclude ODOT from pursuing other options to address or comply with fish passage laws at ODOT structures.
10. ODOT is responsible for obtaining all other state and federal permits and permissions necessary for completion of activities approved by the Agreement.

11. All in-water work associated with this Agreement will occur during the appropriate ODFW in-water work window, or as negotiated.
12. This Agreement in no way purports or authorizes take of a federally listed species.
13. Pursuant to OAR 635-412-0035 (1 and 10) ODOT is responsible for following all best management practices during construction/maintenance activities to protect fish, wildlife, and their habitats. These BMP's include but are not limited to, adequately dewatering and isolating worksites, performing fish salvages, and providing adequate downstream passage, bypass, and screening if necessary.

IV. POST-PROJECT OBLIGATIONS

1. **Maintenance.** ODOT is responsible for all maintenance required such that culverts repaired under this Agreement continue to provide the improved level of fish passage that was achieved under this Agreement.
2. **Inspection and Record-Keeping.** ODFW may inspect any road-stream crossing for which ODOT is responsible (ORS 509.625 and OAR 635-412-0020(3)(b)(D)). If inspection of a culvert repair site installed under this Agreement indicates that fish passage improvements are not functioning as intended, ODFW shall notify ODOT. ODOT shall work with ODFW to determine the cause and, during a work period approved by ODFW, expeditiously rectify problems as necessary (OAR 635-412-0020(3)(b)(E)).
3. **Monitoring and Reporting.** ODOT and ODFW will implement a monitoring plan prior to project construction that will include pre and post repair project site analyses of fish passage conditions. ODOT, or its designee, shall monitor and report all repair projects implemented under this agreement to verify that fish passage improvement(s) function as intended. Monitoring shall be completed after winter and spring channel forming high flow events in years 1, 3, and 5 after completion of each culvert repair and fish passage improvement. Monitoring shall identify native migratory fish species and life stages affected at each culvert repair site and the quantity and quality of habitat above each barrier. Monitoring shall consist of a best professional judgment assessment by a qualified fisheries biologist of fish passage conditions. This includes noting any water surface jumps, channel adjustments, streamflow velocity characteristics, channel bed stability, scour occurrence, and other relevant data to ensure the project is functioning as designed for fish passage. Pre- and post-treatment photographs of each site shall be included in the monitoring reports. If monitoring indicates that fish passage is not being provided consistent with project intent, ODOT shall consult with ODFW, determine the cause, and during a work period approved by ODFW, expeditiously rectify problems as necessary (OAR 635-412-0020(3)(b)(E)). If in the final year, post-project assessment reveals a successful project and that fish passage has not deteriorated, then the project will be removed from the post-project monitoring obligations. ODOT remains responsible for the ongoing maintenance necessary to ensure the improved level of fish passage continues to function until the next trigger event.
4. **Annual Report.** By February 1st of each year of the Agreement, ODOT shall provide an Annual Electronic Report on all culverts repaired under this Agreement. The Annual Electronic Report shall consist of:
 - a) Narrative discussion of program activities,
 - b) Map of culverts repaired under program,
 - c) Description and date of repair action(s) performed at each culvert under the Agreement,
 - d) Description of how fish passage was improved at each culvert repaired under the Agreement,

- e) Project specific monitoring results from monitoring efforts identified in # 3 above,
 - f) Estimate of fish habitat upstream of each culvert, and
 - g) List of species present at each culvert.
 - h) Analysis of estimated annual cost savings of culvert repairs made vs. the cost of culvert replacements.
5. **Final Report.** At the conclusion of the pilot project each agency shall provide a final report.
- a) ODFW shall provide a final pilot project analysis and report on the effect(s) of the pilot project on fish passage. The report will include: site locations, native migratory fish species, quantity and quality of habitat upstream of barriers for both the:
 - I. effects of the culvert repairs and the fish passage improvements made at each repair site, and
 - II. fish passage improvements implemented with the fish passage funds (defined in Section III(3) of this agreement), administered by ODFW.
 - b) ODOT shall provide a final project report on the effect(s) of the pilot project on maintaining the highway infrastructure. The report will include: number of culverts repaired, improvements to infrastructure condition, the cost effectiveness of repairs relative to infrastructure benefits, and an analysis of the cost savings of culvert repairs made vs. the cost of culvert replacements.
 - c) These reports will be used to develop a strategy to address the culvert infrastructure issue(s) on the State highway system and the needs of native migratory fish. Final reports shall be complete by June 30, 2023.
6. **Coordination Meetings.** Staff from ODOT and ODFW affected by this Agreement, will meet annually, or as otherwise deemed appropriate, to collaboratively review projects implemented under this Agreement and evaluate adaptive management measures, as appropriate.

V. GENERAL PROVISIONS

1. **Notice.** The parties' contact persons for all notices provided for under this Agreement, except as specifically provided otherwise, are as follows:

Agency	ODFW	ODFW Technical	ODOT	ODOT Technical
Name	Greg Apke	Pete Baki	William Warncke	Wade Holaday, P.E.
Title	ODFW Fish Passage Coordinator	ODFW/ODOT Liaison	ODOT Fish Passage Program Team Leader	ODOT Culvert Maintenance Engineer
Address	4034 Fairview Industrial Dr. SE Salem, OR 97302	4034 Fairview Industrial Dr. SE Salem, OR 97302	4040 Fairview Industrial Dr. SE Salem, OR 97302	4040 Fairview Industrial Dr. SE MS #6 Salem, OR 97302-1142
Phone	503-947-6228	503-947-6234	503-986-3459	(503) 986-4046
E-Mail	greg.d.apke@state.or.us	Pete.Baki@state.or.us	William.M.Warncke@odot.state.or.us	Wade.HOLADAY@odot.state.or.us

Either party may change a designated contact person at any time by providing written notice to the other party.

- 2. **Amendments.** Amendments to this Agreement may be made within applicable laws at the mutual agreement and signature of the ODFW Fish Screens and Passage Program Manager and the ODOT Environmental Resources Unit Manager.
- 3. **Term.** This Agreement is entered into on the date of last signature by and between ODFW and ODOT, both representing the State of Oregon. This Agreement expires Dec 31, 2022.
- 4. **Termination.** This Agreement may be terminated at any time through mutual agreement by the parties or by either party after a 30-day written notice. If terminated, culverts previously

repaired consistent with this Agreement will not be subject to additional fish passage requirements beyond maintenance as described in IV(1), until an additional trigger event may occur.

RUP
1/19/18



1/18/18

Date



Date

Highway Division Administrator
Oregon Department of Transportation

Chair, Oregon Fish and Wildlife Commission

Appendix A

Examples of ODOT culvert repair actions* allowed under the Culvert Repair Programmatic Agreement that currently trigger fish passage laws

- Strip line
- Spot and localized repairs
- Spray on coating
- Cured in place technology
- Spiral wound
- Pave invert
- Add or extend end treatments
- Replace interior sections of culvert**
- Replace road pavement and sub base above culverts

*The intent of the culvert repairs allowed under the programmatic agreement is to provide (up to) an additional 10 to 25 years of culvert life. The actual life of the culvert and repair will depend on site specific conditions. These repairs are considered short-term fixes, not in effect a culvert replacement that provides a new design life.

** This technique is intended to replace 1 to 3 segments of a pipe that have broken or failed prematurely. It is not intended to replace the majority of the pipe.

Culvert repair techniques not listed above are allowed provided they fully meet all requirements of this agreement. Culvert repair techniques not listed above will be discussed by the ODFW and ODOT contacts identified in section V prior to implementation.

Full traditional Slip-line culvert repairs are specifically excluded from this Programmatic Agreement.