

# ORAFS 2022 Fish Passage Abstracts

## **Adult Pacific Lamprey Passage at Road Crossings: Guidelines for Evaluating and Providing Passage**

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As part of its ongoing efforts to conserve and restore Pacific Lamprey populations, the Lamprey Technical Workgroup (LTW) recently developed guidelines for evaluating potential barriers to passage of migratory adults at road crossings and providing passage. The goals of the guidelines are to raise awareness of adult Pacific Lamprey passage requirements—which are very different from that of salmon—and to help biologists and engineers identify and prioritize barriers to the species and provide unimpaired passage at road crossings. Drawing from various case studies, this presentation will summarize the following elements of the LTW guidelines: (1) current understanding of the key factors affecting passage of adult Pacific Lamprey, (2) process for evaluating passage at road crossings, (3) considerations for prioritizing barrier sites for passage remediation, (4) options for improving passage at road crossings, and (5) key data gaps and uncertainties related to adult Pacific Lamprey passage. While focused on passage at road crossings, the information and concepts covered will be applicable to understanding lamprey passage issues at other instream migration obstacles.

## **Expanding the Southeast Aquatic Barrier Prioritization Tool: Assessing Aquatic Fragmentation in the Western United States**

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Ward Fragmentation of river habitats by anthropogenic barriers is one of the primary threats to aquatic species in the United States. In an effort to address this issue, SARP has been working with partners including USFWS to identify, prioritize, and remove barriers to aquatic organisms in the Southeastern United States through the Southeast Aquatic Connectivity Program. SARP has developed a comprehensive living inventory of dams and road stream barriers as well as detailed metrics to prioritize these barriers for removal or bypass. The inventory and prioritization is fed to Astute Spruce, who has created a user-friendly interactive tool where partners can readily access this information. The Southeast Aquatic Barrier Prioritization tool provides summaries of barrier densities within user specified areas of interest and allows users to prioritize barriers for removal based on ecological metrics using various filters. The results provided by the tool help identify high priority projects to implement and allow resource managers to access information regarding barrier locations and attributes that were not readily accessible in a one stop shop prior to SARP's work. Using these results, within the Southeast, SARP has been working with partners within and outside of state-based Aquatic Connectivity Teams to incorporate on the ground information and implement high priority barrier removal or remediation projects. With additional funding from the US Fish and Wildlife Service Fish Passage Program, this

inventory and tool will be expanded using available data into an additional 12 western states, including Oregon, over the next three years.

### **State of Oregon Fish Passage Design Rules --- Revision Update ---**

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The Oregon Department of Fish and Wildlife (ODFW) Administers the state's fish passage policy and administrative rules. ODFW is in the process of revising these rules, in particular the state's fish passage design criteria. This presentation will provide an update on the rule revision process and will highlight some of the important fish passage design changes being considered by the state.

### **Stream road crossings in the Pacific Northwest – what’s missing and how to find it**

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Road networks are a constant presence of human infrastructure in Pacific Northwest ecosystems. Maintaining and inventorying stream-road crossings is a management priority due to how impactful road networks are on stream systems. Roads influence streams in a variety of ways, including changing stream flows, increasing fine sediment loads, altering stream nutrient concentrations, and decreasing stream habitat connectivity for aquatic organisms like native fishes. Currently there are a variety of agency datasets inventorying stream-road crossings in the region. These databases facilitate prioritization of where to spend time and money when maintaining or replacing stream road crossings that are barriers to native fish passage or are in danger of failing to support natural hydrologic and geomorphic processes and road infrastructure. Even with all the crossings included in these established datasets, there are still hundreds if not thousands of stream-road crossings that are not documented. Some crossings we know exist but have not yet been surveyed, while other crossings have not been recorded in any database. Our objective is to create a usable and accessible peer reviewed, publicly available, dataset and an accompanying stream-road crossing assessment survey using a tested feature mapping platform. Recently, the flow permanence survey and dataset FLOWPER was established to provide a quick and accessible field survey utilizing mobile data collection to map flow to an online hosted feature layer. This effort was very successful with nearly 10,000 flow permanence observations collected in three years and we anticipate it will be an accessible platform for establishing a stream-road crossing survey. Our current project will review data collected as part of stream-road crossing surveys for stream habitat and/or road management efforts to ensure that we develop a survey protocol that meets management needs while being transferable across existing stream-road crossing datasets.

## **Salmon SuperHwy – Reconnecting Fish Habitat and Communities at a Landscape Scale**

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Since 2010, a collaborative partnership has been working in the Tillamook-Nestucca subbasin under a national pilot uses a landscape scale, strategic approach to focus efforts to increase habitat connectivity, improve road-stream crossings, and increase climate resiliency in aquatic and transportation networks that benefit fish and wildlife species, as well as local communities. The project area encompasses the Tillamook Bay, Nestucca, and Sand Lake watersheds along the Northern Oregon Coast in Tillamook County. Salmon SuperHwy partners collaborate to provide technical expertise and leverage funding to work with public and private landowners to complete a portfolio of high priority fish migration barrier projects that provide the biggest habitat benefits for the funding investment. Using a strategic, scaled approach designed to maximize benefits and minimize costs, this unique community partnership developed a portfolio of 93 priority projects that will restore access to almost 180 miles of blocked habitat throughout six major salmon and steelhead rivers of Oregon's North Coast. Their completion will reconnect at least 95% of historic habitat for each species, reduce chronic flooding, improve recreation opportunities, and stimulate the local economy. Since 2012, Salmon SuperHwy partners have implemented 43 fish passage barrier removal projects, reconnecting over 115 miles of habitat, and leveraging \$16 million of federal, state, local, and private funding. Nationally renowned for its salmon and dairy production, Tillamook County is comprised largely of federal, state, and industrial forest lands (92%) which interface with small woodlot forest land, residential, rural residential, and agricultural ownerships in the lowlands. The heavily forested mid and upper watersheds provide spawning and rearing habitat for native fish species including cutthroat and steelhead trout, coho, chinook, and chum salmon and lamprey. The lowlands are intensively used for agriculture, primarily for dairy production. A strong tradition of local habitat work, rich salmon and steelhead recovery potential, and experienced local capacity united public agencies, private non profit organizations, and the community at large into the Salmon SuperHwy Partnership.

## **Lessons from Reuniting an Old Growth Drainage: North Creek Aquatic Passage Project**

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The North Creek Aquatic Organism Passage (AOP) Project reconnected 13 miles of fish habitat; providing an anadromous migration corridor for Oregon Coastal ESU Coho Salmon, Chinook Salmon, Steelhead DPS, Coastal Cutthroat, Pacific Lamprey, and Freshwater Mussels. The 4.4 sq mile North Creek drainage is situated on the Siuslaw National Forest and comprised primarily of old growth forest. It is a tributary of Drift Creek within the Siletz Watershed on the North Central Oregon Coast and contributes to one of the only tribal fishing sites left on the Oregon Coast. This unique watershed gets over 150 inches of rain annually and is one of the few locations in the western coast range with igneous geology. Cool summer stream temperatures along with quality riparian habitat contribute to excellent upstream aquatic conditions, creating the impetus for this major project. The objectives of the project were to install an AOP structure, improve hydrologic and fluvial processes, provide streambank stabilization, and protect the FS road for public safety. The historic 62- year-old 11' corrugated metal pipe and degraded concrete weirs were a hydraulic barrier to aquatic passage and a significant impediment for sediment and large wood transport into Drift Creek. In 2019 the project removed these legacy structures and installed a 50' wide open bottom arch culvert and over 300' of streambed simulation. Revegetation of the adjacent road slope that provides sole access to a large camp facility and recreational access to Drift Creek was also completed. Observational results by winter of 2019-20 documented spawning fish seen in formerly degraded habitat downstream, within the culvert structure, and upstream. Lessons learned relate to wide-spread partnering and funding to complete the \$1.1 million project, design to capture reference conditions in a human-altered landscape, contractor services, water and rock management during on-the-ground implementation, and ongoing site monitoring and review.

### **Whiskey Creek Culvert Replacement**

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The previous Whiskey Creek culvert was a 60 inch corrugated metal culvert that was undersized causing periodic flooding of OR244. Furthermore, the previous culvert was a velocity barrier to fish passage during high flows and had a foot jump height barrier to juvenile passage during low flows. This culvert was listed as "high priority" on the 2017 ODFW Statewide Fish Passage Priority list for replacement. The project replaced the existing culvert with a much larger stream crossing (concrete box culvert) that provides full, year-round fish passage and meets the fluvial standards of the National Marine Fisheries Service (NMFS) and United States Fish and Wildlife Service (USFWS). Whiskey Creek is a tributary of the Grande Ronde River and contains ESA-listed Snake River Basin (SRB) steelhead and is designated critical habitat. Replacing the existing culvert in 2020 improved fish access to 15.61 miles of SRB steelhead habitat above the culvert. The existing culvert is at the confluence of the Grande Ronde River which contains ESA-listed SRB steelhead, Snake River spring/summer run Chinook salmon, Columbia Basin bull trout, and is designated critical habitat for those species. Realignment of the new culvert required the creation of a new upstream channel for approximately 450 feet above the new culvert inlet. The previous stream channel of Whiskey Creek went dry in the summer. This new channel contains water year-round and provides much needed off-channel habitat for fish that inhabit the Upper Grande Ronde River Basin. Project coordination and partnerships included the Confederated Tribes of the Umatilla Indian Reservation, NMFS, USFWS, Department of State Lands, Corps of Engineers, and the Oregon Department of Fish and Wildlife.

## **Early Predication Method for Native Migratory Fish Presence at Small Culverts**

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Oregon Fish Passage laws stipulates that artificial obstructions along Oregon waterways are subject to review by the Oregon Department of Fish and Wildlife (ODFW) and the Oregon Department of Transportation (ODOT) when maintenance is required. These agencies determine if the obstruction prevents the use and access of habitat of one or more of 32 native fish species categorized as migratory by the law. If so, a review of pertinent fish passage laws is triggered. This project aimed to develop a GIS-based tool to support the initial evaluation of a subset of these artificial obstructions – small ( $\leq 0.91$ m diameter) culverts that have been identified along the Oregon highway system. The culvert scoping tool We developed uses Light Detection and Ranging (LiDAR)-derived bare-earth digital elevation models, the National Hydrography Dataset Plus High Resolution, the ODFW barrier database, and species distribution models as inputs to determine if a target culvert would trigger the need for the fish passage law review. Results of the toolbox were evaluated against field surveys of randomly selected culverts within two basins that had appropriate LiDAR coverage and demonstrated the tool was successful at parsing fish call and non-fish call culverts. The culvert scoping tool is operable in ArcPro as an added toolbox and is intended to streamline ODOT's ability to plan projects so that fish habitat connectivity is preserved and improved throughout the state.