



# Technical Memorandum

Date: March 21, 2018

To: The Cove, LLC

From: John Runyon, Watershed Ecologist, and Principal

**Re: Clackamette Cove, Oregon City: Enhancement Discussion**

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## Introduction

The Cove, LLC is proposing habitat enhancement activities that include bank grading along approximately 1,600 linear feet of Clackamette Cove's bank. These actions are designed to enhance Clackamette Cove's habitat values and functions and provide floodplain balance for the project. Existing vegetation dominated by native cottonwood trees and invasive Himalayan blackberry will be removed during grading, and a diverse array of native vegetation will be planted on the re-graded bank.

This memorandum provides the scientific rationale for how the proposed grading and native vegetation planting will enhance Clackamette Cove's habitat functions and values. The proposed activities, which will address unnatural landforms, debris, and non-native vegetation, align with the recommended habitat enhancement approach documented in Cascade Environmental Group, LLC's *Clackamette Cove Water Quality and Habitat Improvement Feasibility Study* ("Feasibility Study", 2017). The *Feasibility Study* was prepared for the City of Oregon City to characterize the current status of Clackamette Cove's habitat and water quality and recommend habitat enhancement approaches.

## Background

Clackamette Cove (Cove) is an unnatural landscape embedded in one of the most important river and floodplain habitat areas in the Willamette Valley. Historically the area occupied by the Cove was a dynamic floodplain characterized by high-quality fish and wildlife habitat. The Cove's expanse of open water and its immediate surrounding area were created by past gravel mining and other industrial operations. The Cove's topography has been dramatically altered by these activities. Steeply sloped banks separate the open water areas from the floodplain terrace areas. Large slabs of concrete, wire cable, metal pieces, and other debris cover the steeply sloped banks. In addition, the banks are covered by blackberries and other non-native plant species. The unnatural features and vegetation have severely degraded the Cove's natural habitat values and ecosystem functions.

The lower Clackamas River and floodplain provide regionally important fish habitat. The river, which has some of the healthiest native fish populations in the Willamette Basin, supports critical habitat for salmon and steelhead, which are listed under the federal Endangered Species Act (ESA). The Willamette-Clackamas river confluence area, which includes the Cove, is recognized by the State of Oregon and federal agencies as important habitat for salmon, steelhead, and other native fish populations, including Pacific lamprey.

The Cove provides aquatic habitats that are occupied by a variety of native fish species, including ESA-listed juvenile salmon and steelhead, and Pacific lamprey (a State of Oregon and federal sensitive species). While there are no detailed observations of Juvenile salmon, steelhead, and lamprey residing in the Cove, these fish are present all year in the lower Willamette and Clackamas Rivers and are present in the Cove. Research has shown, for example, that spring Chinook salmon juveniles occupy the lower Willamette River and similar off-channel habitats throughout the year, with peak densities occurring in winter and spring<sup>1</sup>. The research also shows that these fish are actively growing during their residence, suggesting that feeding and rearing in these areas are important for their survival.

The Clackamas River, including the Cove, is listed as critical habitat for ESA-listed salmon and steelhead adult migration and juvenile rearing. As a result of degraded habitat conditions and the need to recover ESA-listed salmon and steelhead, state and federal fisheries agencies have prioritized the restoration of habitats at the confluence of the Willamette and Clackamas rivers, including the Cove<sup>2</sup>.

The Cove's expanse of relatively deep water and simplified shoreline areas characterized by steeply sloped banks, coarse cobbles and other materials, and minimal native vegetation provides very little of the habitats that juvenile salmon and steelhead need to rear and grow during their migration to the ocean. These fish prefer to rear and feed in areas with a diversity of habitat types, including riparian vegetation and a mix of substrates. For example, juvenile Chinook and coho salmon usually are found in shallow near shore habitats and prefer gently sloped areas where sand is the major substrate type<sup>3</sup>. Sandy beach areas are not a preferred habitat of large predator fishes that feed on

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<sup>1</sup> Friesen, T.A., J. S. Vile, A. L. Pribyl. 2007. Outmigration of juvenile Chinook salmon in the lower Willamette River, Oregon. Northwest Science 81(3):173-190. <http://www.bioone.org/doi/abs/10.3955/0029-344X-81.3.173>

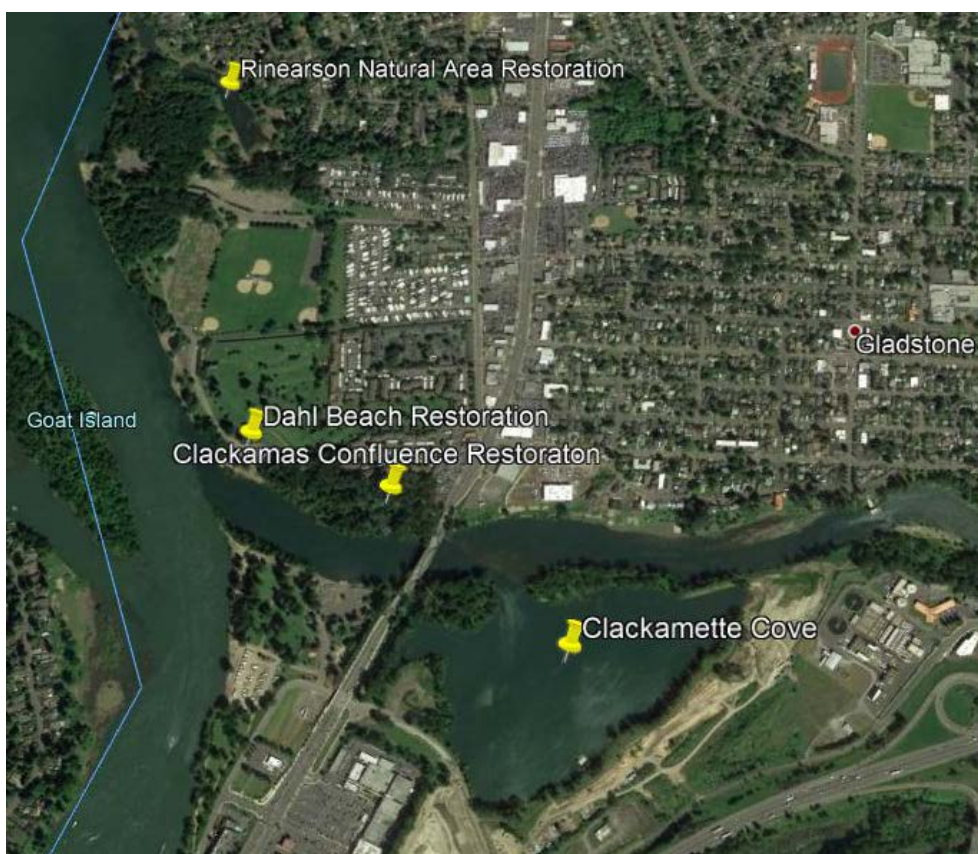
<sup>2</sup> Oregon Watershed Enhancement Board (OWEB). 2016. Willamette River Anchor Habitat Priorities. OWEB, Salem, OR.

<sup>3</sup> Friesen, T. A. J. S. Vile, and A. L. Pribyl. 2005. Migratory behavior, timing, rearing, and habitat use of Juvenile salmonids in the lower Willamette River. Pages 63-138 in T. A. Friesen (editor): Biology, Behavior, and Resources of Resident and Anadromous Fish in the Lower Willamette River: Final Report of Research, 2002-2004. Report prepared for the City of Portland by ODFW, Clackamas, OR.

juvenile salmon and steelhead<sup>4</sup>. For the most part juvenile Chinook and coho avoid areas with the kinds of habitats present in the Cove: steeply sloped banks with coarse substrates and debris.

To address habitat degradation in the Willamette-Clackamas river confluence area, three aquatic and riparian habitat restoration projects in the vicinity of the Cove were constructed in 2016 and 2017 (Figure 1). Each of these projects involved habitat enhancement activities centered on bank grading and native vegetation planting.

**Figure 1. Habitat restoration projects in the vicinity of Clackamette Cove. Bank grading and native vegetation planting were the primary habitat enhancement actions.**



## Current Habitat Evaluation

Steep banks (nearly 1:1 slopes in many areas) rise from the bottom of the Cove to the floodplain terraces above. The uniformly steep banks limit habitat diversity and have created poor conditions for the establishment of high-quality habitat for fish and wildlife, including native riparian vegetation.

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<sup>4</sup> Pribyl, A. L., J. S. Vileb, and T. A. Friesen. 2005. Population structure, movement, habitat use, and diet of resident piscivorous fishes in the lower Willamette River. Pages 139-183 in T. A. Friesen (editor): Biology, Behavior, and Resources of Resident and Anadromous Fish in the Lower Willamette River: Final Report of Research, 2002-2004. Report prepared for the City of Portland by ODFW, Clackamas, OR.

The area where the habitat enhancement actions are proposed presents the best opportunity within the Cove for contouring the banks to a more natural slope and addressing degraded habitat. The other areas within the Cove, such as the North-West and North-East Peninsulas, are narrow and subject to erosion from the Clackamas River; any bank grading in these areas would need to be done in a manner that does not create conditions that could lead to the river eroding through the peninsulas.

The proposed grading and native planting enhancement activities will address the following degraded habitat functions and values:

- Limited fish and wildlife habitat complexity and quality due to steep slopes, debris, and weedy vegetation.
- Public safety hazards resulting from debris, remnant industrial materials, and steep banks.
- Impacts to the area's aesthetic qualities from bank debris, remnant structures, and weedy vegetation.
- Poor conditions for ESA-listed salmon and steelhead feeding and rearing during high water events due to steep slopes, coarse substrate, debris, and weedy vegetation.

## Habitat Enhancement Recommendations

The proposed grading and native planting aligns with the following *Feasibility Study* findings and guidance for habitat restoration in degraded sand and gravel mining areas<sup>5</sup>:

- Contouring unnatural banks to a more natural landform to improve revegetation success and provide more diverse fish and wildlife habitat.
- Creating bank slopes of 3H:1V or flatter above ordinary high water for optimal habitat functions and characteristics, vegetation establishment, and public safety.
- Removing debris and remnant industrial materials as part of bank grading and habitat enhancement actions.
- Removing non-native vegetation and planting native vegetation on the re-contoured banks to improve riparian habitat and enhance habitat functions.

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<sup>5</sup>Norman, D. K., P. J. Wampler, A. H. Throop, E. F. Schnitzer, and J. M. Roloff. 1997. Best Management Practices for Reclaiming Surface Mines in Washington and Oregon. Oregon Department of Geology and Mineral Industries, Salem, OR; and Washington State Department of Natural Resources, Olympia, WA.  
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