Coquille Watershed Association

Promoting Natural Resource Conservation and Economic Stability in the Coquille Watershed

Lower Coquille Tide Gate and Fish Passage Monitoring White Paper

Project Name: Lower Coquille Tide Gate and Fish Passage Monitoring (LCTGFPM)
Total Project Budget: $638,022
Funding Sources:

1. NOAA - $294,832
2. OWEB - $235,725
3. USFWS - $50,000
4. WRCA - $49,955
5. TNC - $10,000
6. In-kind (ODFW) - $47,460

Project Summary: The Lower Coquille Tide Gate and Fish Passage Monitoring Program leverages the close proximity both temporally (completed within a 2 yr period) and spatially (7 river miles) of three tide gate upgrade and tidal habitat restoration projects within the lower Coquille River. The overarching goal is to work collaboratively to examine not only the functionality of individual tide gate projects but how their compounded uplift promotes recovery of the Oregon Coast ESU coho population. It is important to complete this effectiveness monitoring at the forefront of the tide gate replacement movement that is growing along the Oregon Coast to ensure we are maximizing ecological benefits and return on investment. These three tide gated projects are in the freshwater-marine ecotone, which makes it well situated to examine the cumulative benefit provided to overwintering juvenile coho and Chinook salmon.

The LCTGFM Program incorporates the following restoration effectiveness monitoring projects:

<u>SECURED FUNDING:</u>

Winter Lake Restoration Effectiveness Monitoring (OWEB) - A three-year project to monitor the effectiveness of the restoration efforts at Winter Lake. The monitoring entails measuring 14 different elements to encompass water quality and quantity, the study sites physical and landscape attributes and the response of salmonids to the restoration parameters. Three years of weekly fish sampling and tagging events is included in this project with the final year (winter of 2020-2021) coinciding with the first year of proposed Passive Integrated Transponder (PIT) antenna array operations and sampling events in the Coquille River.

Winter Lake Fish Passage and Migration Monitoring (NOAA) – A three-year project that focuses monitoring efforts on fish passage through the Winter Lake tide gates and

quantifies growth rate, abundance and survival associated with residence time within the project area. This will be accomplished through an intensive fish sampling and PIT tagging effort in the Coquille River, the Winter Lake units and reference site (Beaver Creek) and the installation and operation of PIT antenna arrays on the Winter Lake tide gates to track fish movement and residence time.

Lower Coquille Restoration Effectiveness Monitoring (OWEB, USFWS) –This project will tie in the restoration work completed further downstream of Winter Lake at two other locations in the Coquille Valley. PIT antenna arrays will be installed and maintained on the upgraded tide gates at the LCRWSE and Seestrom projects in addition to temperature, salinity and water level loggers. Additional monitoring will be completed at the Seestrom site to ensure this project complies with its MAMP (funded by USFWS) such as dissolved oxygen and channel stability. Fish sampling and tagging at each site will be included in this 3-year project. Results from the project will be coupled with the listed projects above to determine how size of tide gate upgrade and habitat restoration affects juvenile coho response to the different restoration projects.

Coaledo Tidelands Fish Passage Monitoring (WRCA, TNC) – This project will provide a PIT antenna array structure on the failing and leaky Coaledo tide gate of Beaver Creek. Although Beaver Creek is constrained by a tide gate it is the reference site for the LCTGFPM program because the tide gate has been deemed a minimal barrier for fish passage. Additionally, the Coaledo tide gate is slated to be replaced in 2023 therefore this project will also provide a robust pre-restoration data set.

COLLABORATIONS (CURRENT AND POTENTIAL):

ODFW - An important aspect of the LCTFPM Program is the partnerships between CoqWA, ODFW Research Evaluation Data & Decision (REDD) Group, ODFW Charleston field office and ODFW The Dalles Research Station. The ODFW Charleston field office has intricate knowledge of the project sites and Coquille Estuary that will aid immensely in the field portion of this monitoring program. Much of the Coquille River sampling will occur upstream of the Winter Lake project and knowing which locations are both effective and safe for seining is crucial to this projects success. In addition, they have committed to 5 sampling events every winter in the lower Coquille River on top of the support they provide for the current Winter Lake Restoration Effectiveness Monitoring project.

The ODFW The Dalles Research Station expertise in PIT antenna arrays will be utilized to guarantee successful construction and installation of arrays on the tide gates. In addition,

design of the arrays by a leading expert will maximize detection efficiency leading to a more robust data set and analysis.

The ODFW REDD group is at the forefront of statistical analysis and modeling with respect to fish populations in Oregon. They will be handling the bulk of data analysis ensuring current methodologies are followed and results are accurate and thorough.

Monitoring Committee - In addition to these partnerships the Winter Lake Monitoring Committee will continue to advise and meet with regards to work occurring in Winter Lake and the Lower Coquille. The committee consists of a broad range of fields and expertise and serves to technically advise the monitoring work led by the Coquille Watershed Association. Members of the committee include the Coquille Indian Tribe, NMFS, ODFW, DEQ, Beaver Slough Drainage District and OWEB.

Project Goal and Objectives:
The primary goal for this monitoring project is to improve our understanding of how juvenile coho and Chinook respond to the varied sizes and complexities of new MTR tide gates and the restored habitat created upstream. In addition, a more comprehensive understanding of the migratory habits of juvenile coho within the Coquille Estuary will be determined and help inform future tideland restoration projects. A secondary goal is to aid in the adaptive management of these tide gate projects by providing data that informs how current tide gate management practices influence the project's objectives.

Objectives

1. Quantify the percentage of juvenile coho residing in the lower mainstem of the Coquille River who enter the restored Winter Lake, Seestrom and Cochran project area.

2. Estimate the total annual number of juvenile coho that enter and use the three restored project areas.

3. Estimate the increase in overall body condition between riverine-reared juvenile coho and those reared in the Winter Lake, Seestrom and Cochran project area.

4. Develop an understanding of growth rate comparing riverine-reared juvenile coho and those reared in the Winter Lake, Seestrom and Cochran project area. In addition, determine if growth rate varies with overall size of restored habitat.

5. Quantify the residence time of juvenile coho in floodplain habitats upstream of a fully redesigned and technologically advanced tide gate and determine if residence time varies with overall size of restored habitat.

6. Develop survival estimates for coho juvenile during residence time in the Winter Lake, Seestrom and Cochran project area and determine if survival varies with overall size of restored habitat.

7. Determine if and how rearing density varies with overall size of restored habitat behind an upgraded tide gate.

8. Develop an understanding of fish movement between the 3 units of BSDD by means of movement through the new Winter Lake tide gate when units are not hydrologically connected (non-flood events). In addition, determine if fish move between units when the units are hydrologically connected during flood events.

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Location:

a. **Stream name:** Coquille River (river mile 13)
b. **Latitude/longitude:** 43.144871,-124.296538
c. **Township/range:** T28S R13W

Project Partners: Oregon Department of Fish & Wildlife (Charleston, REDD Group, The Dalles), Coquille Watershed Association

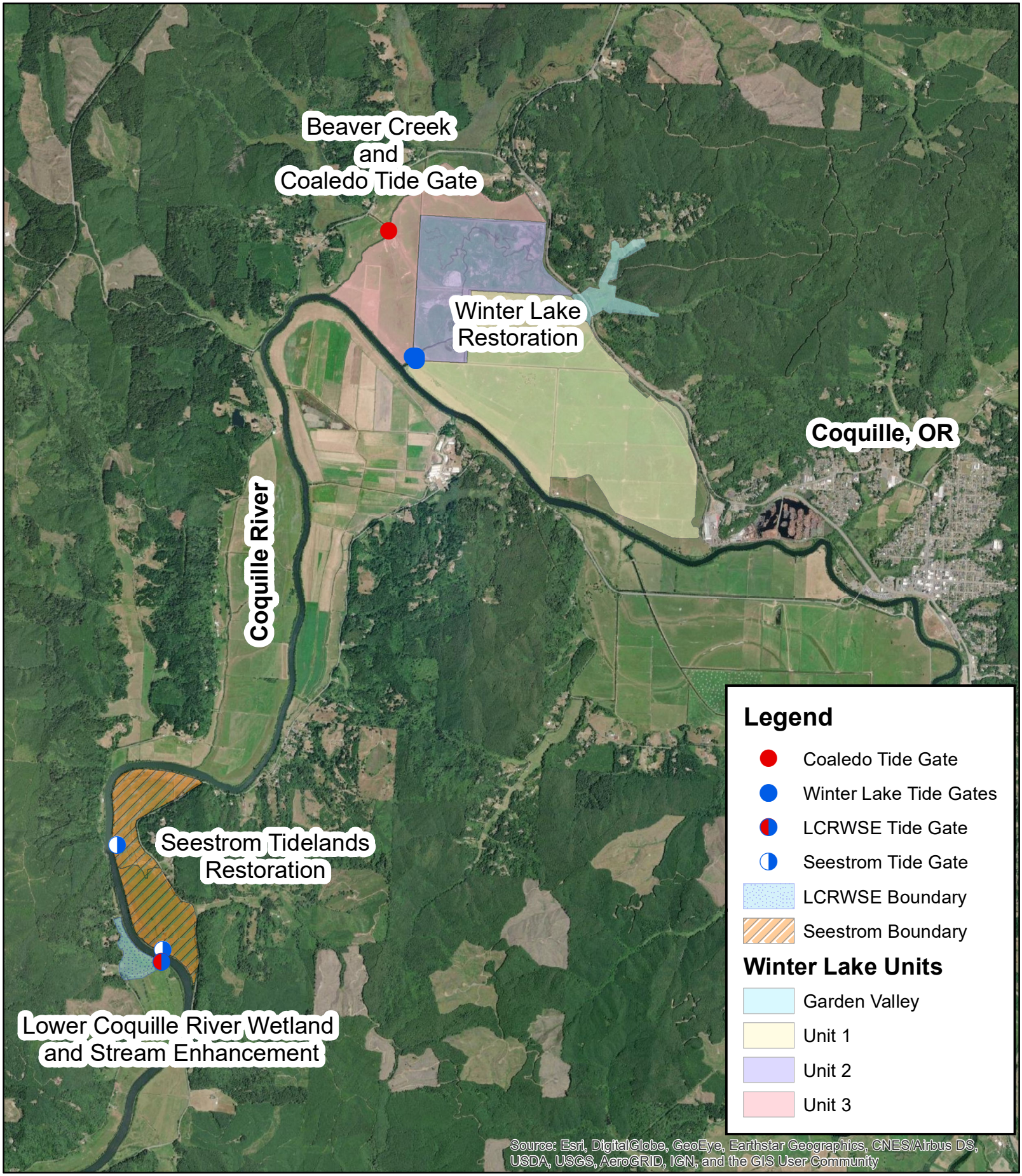
Table 1. Summary of monitoring actions and funding source of the Coquille Watershed Association's *Lower Coquille River Tide gate and Fish Passage Monitoring Program.*

Lower Coquille Tide Gate and Fish Passage Monitoring Program

Monitoring Actions (5 years)	NOAA	OWEB 1[1]	OWEB 2[2]	USFWS	WRCA/ TNC
Mainstem Coquille River (years 1-5): juvenile coho trapping and tagging	X				
Winter Lake (years 1-5): juvenile coho trapping and tagging	X	X			
Beaver Creek (reference site, year 1-5): juvenile coho trapping and tagging	X	X			
Seestrom (years 1-5): juvenile coho trapping and tagging			X	X	
Cochran (years 1-5): juvenile coho trapping and tagging			X		
Winter Lake (years 1-5): installation of PIT antenna arrays on 4 tidegates	X				
Seestrom and Cochran (years 1-5): installation of a PIT antenna array on 1 tidegate each			X		
Beaver Creek (reference site, years 2-5): Installation of a PIT antenna array					X

1 - Winter Lake Effectiveness Monitoring grant

2 - Lower Coquille River Effectiveness Monitoring grant



Lower Coquille Tide Gate and Fish Passage Monitoring

0 0.2 0.4 0.8 1.2 1.6 Miles

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Date: May 2021