



Memorandum

Date: April 23, 2020
To: Gary Howard and Evan Ocheltree
Columbia Restoration Group, LLC
1061 NE 9th Street, Suite 0105
Portland, OR 97232
From: Kyle Brakensiek, Environmental Scientist, and Dan Elefant, PE, Project Engineer
RE: **Rinearson Creek Restoration Monitoring Year 1 (2020) – Native Fish and Water Quality**

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1.0 Introduction

This memorandum provides a progress update on monitoring efforts throughout the Rinearson Creek restoration project site to determine fish presence/abundance and water quality trends. Preliminary monitoring results encompass the period from January through March of 2020. Results address two primary monitoring components: assessing fish presence and abundance and general water quality conditions. Scheduled sampling for the second half of March and first half of April 2020 was not conducted due to state-mandated safe-distancing measures resulting from the COVID-19 pandemic.

The Rinearson Natural Area Restoration Project is located at Meldrum Bar Park, in Gladstone, Oregon. The project sits at the confluence of the Rinearson Creek and the Willamette River, on land owned by a combination of public and private entities. Initial restoration construction was completed in 2018 and entailed removal of an earthen dam, and overall modification in channel structure, establishment of native vegetative communities and addition of in-channel large woody debris. Restoration efforts are aimed at restoring natural structure, improved conditions for native fish communities and improved long term water quality.

A comprehensive monitoring plan has been developed to direct long term monitoring goals and methods (Rinearson Natural Area Habitat Development Plan, December 2018). As Year 1 of the ten year monitoring plan, environmental professionals with Cardno Inc. have been contracted to implement the monitoring plan of which components include monitoring of fish communities and baseline long term monitoring of water quality conditions.

2.0 Native Fish Presence/Abundance

The restoration monitoring protocol involves biweekly (twice a month) sampling for fish presence and abundance beginning in February and continuing through May. Fish sampling was conducted using beach seine methods and, if applicable, direct observation snorkel methods. Using beach seine methods, the project site was sampled for fish on February 10, February 24, and March 13. Suitable seining sites were initially identified in February and include seven established sites for repeat sampling (Figure 1). On a given sample day, not all seven sites were beach seine sampled. This was due to unfavorable conditions such as changes in water depth or

monitoring protocols that call for the cessation of seine sampling if Endangered Species Act (ESA)–listed salmon are captured.

Monitoring protocols also include snorkel-diver fish counts above the remnant (beaver) pond, given suitable conditions. The project area above the beaver pond can be generically characterized, moving upstream, as (1) narrow braided wetland marsh channels turning into (2) a more defined creek channel with two “larger” pool areas. Throughout the upper reach, channel substrate is predominantly porous mud-silt. In February and March, it was determined that poor underwater visibility (likely due to precipitation runoff drainage) prevented snorkel fish count surveys. With improved water clarity, snorkel fish counts are best suited to the two larger pool areas, where the creek channel is more defined with greater water depth.

Seine sampling was conducted using a beach seine net 50 feet in length and 6 feet in height, with ¼-inch mesh netting. On a given day, a seine site was sampled once. Seine area was coarsely approximated for each beach seine sample haul. Captured fish were recorded according to species and total abundance, and a subset of fish were sampled for fish lengths. This progress report does not provide analyses on fish densities and fish length compositions.

Over three sample events, two in February and one in March, a total of 14 beach seine hauls were conducted throughout the seven established seine sites (Table 1; Figure 1). Beach seine sites (BSS) were distributed throughout the project area to represent four general habitat strata: the Willamette River (BSS 1 and BSS 2), lower Rinearson Creek confluence pool (BSS 3), beaver pond (BSS 4–6), and the upper marsh channel complex (BSS 7).

Table 1. Locations by Survey Date for Beach Seine Sampling throughout the Rinearson Creek Restoration Project Site

Sample Date	Beach Seine Site (BSS)						
	BSS 1	BSS 2	BSS 3	BSS 4	BSS 5	BSS 6	BSS 7
10-Feb	X	X	X	X	X	X	X
24-Feb	X	X	X	X	X	X	
13-Mar	X	X					

Note: Beach seine sites are numbered sequentially, moving upstream; refer to Figure 1 for seine site locations.



Figure 1. Rinearson Creek restoration monitoring, 2020 (“Year 1”). Approximate locations are shown for repeated sampling to determine water quality trends and fish presence/abundances using beach seine sample methods.

Per monitoring protocols, beach seine sampling on March 13 was halted after only two sites were sampled due to the capture of ESA-listed juvenile Chinook salmon. Chinook salmon were caught at BSS 2, which is located in the Meldrum Bar Channel in the Willamette River.

In total, 11 different species of fish were captured (Table 2). A total of 208 fish were captured using beach seine methods, with approximately half of all fish captured being juvenile Chinook salmon. Nearly all fish captured were juvenile fish, with the exception of threespine stickleback and common carp. One ESA-listed juvenile coho salmon was captured in the beaver pond (BSS 4); it was decided to continue sampling for that day given only one ESA-listed fish was captured. Fish caught in relative abundance include bluegill, threespine stickleback, and northern pikeminnow. Diversity of fish captured, at a given site, was greatest at BSS 7 above the beaver pond (Table 3).

Table 2. Fish Species Caught using Beach Seine Methods throughout the Rinearson Creek Restoration Project Site in February and May of 2020

Common Name	Scientific Name
Chinook salmon	<i>Oncorhynchus tshawytscha</i>
Coho salmon	<i>Oncorhynchus kisutch</i>
Bluegill	<i>Lepomis macrochirus</i>
Threespine stickleback	<i>Gasterosteus aculeatus</i>
Northern pikeminnow	<i>Ptychocheilus oregonensis</i>
Prickly sculpin	<i>Cottus asper</i>
Reticulate sculpin	<i>Cottus perplexus</i>
Banded killifish	<i>Fundulus diaphanus</i>
Common carp	<i>Cyprinus carpio</i>
Largescale sucker	<i>Catostomus macrocheilus</i>
Chiselmouth	<i>Acrocheilus alutaceus</i>

Table 3. Summary Catch Statistics for Fish Captured using Beach Seine Methods throughout the Rinearson Creek Restoration Project Site

Fish Species	Sampling Location						Grand Total
	BSS 2	BSS 3	BSS 4	BSS 5	BSS 6	BSS 7	
Banded killifish		4					4
Bluegill		4	16	16	1		37
Chinook salmon	106						106
Chiselmouth	1						1
Coho			1				1
Common carp		1				1	2
Largescale sucker	1						1
Northern pikeminnow	16			3		1	20
Prickly sculpin						2	2

Fish Species	Sampling Location						Grand Total
	BSS 2	BSS 3	BSS 4	BSS 5	BSS 6	BSS 7	
Reticulate sculpin						4	4
Threespine stickleback						30	30
Grand Total	124	9	17	19	1	38	208

Notes: Values reflect total catch for three sample events: February 10 and 24, and March 13, 2020. Beach seine sites are numbered sequentially, moving upstream; refer to Figure 1 for seine site locations.

3.0 Water Quality Monitoring – Temperature and Dissolved Oxygen

Project monitoring protocols call for once-a-month sampling of water quality parameters that include temperature, dissolved oxygen, pH, and conductivity. Water quality characteristics were determined using a handheld field multiparameter meter. A total of 11 water quality monitoring sites were established throughout the project area for repeated sampling and long-term monitoring (Figure 1). Water quality sampling was conducted on January 9 and February 13, 2020. No sampling occurred in March and early April given safety precautions due to the COVID-19 outbreak.

All water quality field sampling was conducted between the hours of 9 AM and 2 PM. Each sample day, water quality monitoring began at the Meldrum Bar boat ramp and proceeded upstream into Rinearson Creek. Water quality station (WQS) 1 is located in the Meldrum Bar Channel as part of the Willamette River, WQS 2 is at the outlet confluence of Rinearson Creek, WQSs 3 through 5 are located in the lower restoration segment of Rinearson Creek, WQSs 6 through 8 are within the beaver pond, and WQSs 9 through 11 are above the beaver pond in the wetland marsh complex of the restoration project area (see Figure 1). Thus, water quality results can be generically interpreted as applicable to: the Willamette River, lower Rinearson Creek (restoration) channel, the beaver pond, and the upper wetland channel complex. Figures 2 through 5 summarize water quality monitoring results. A more thorough analyses of water quality monitoring results will be provided as part of a following June 2020 interim report.

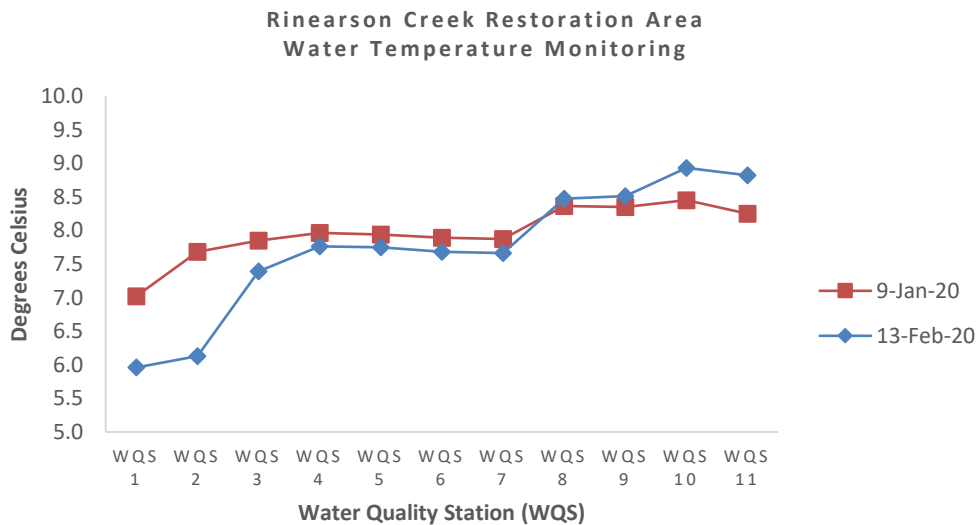


Figure 2. Water temperature monitoring results.

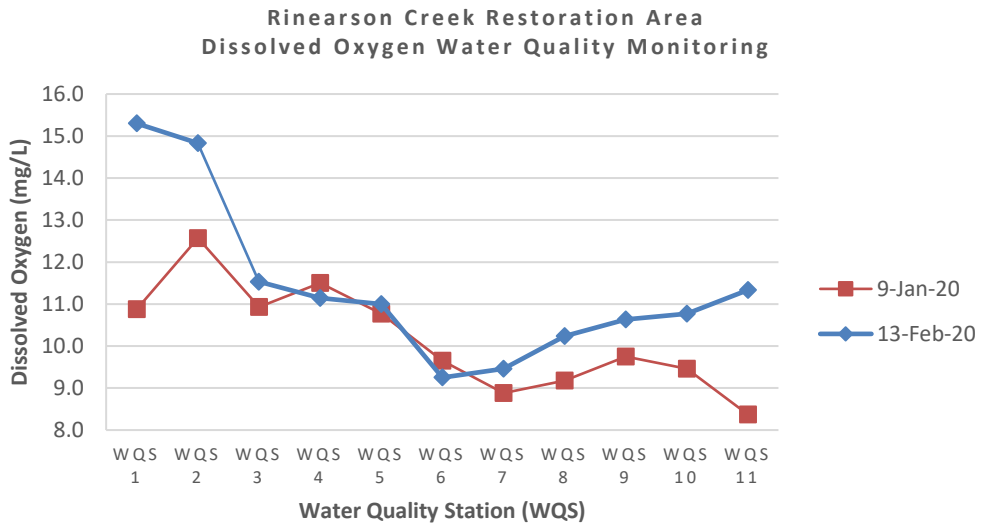


Figure 3. Dissolved oxygen monitoring results.

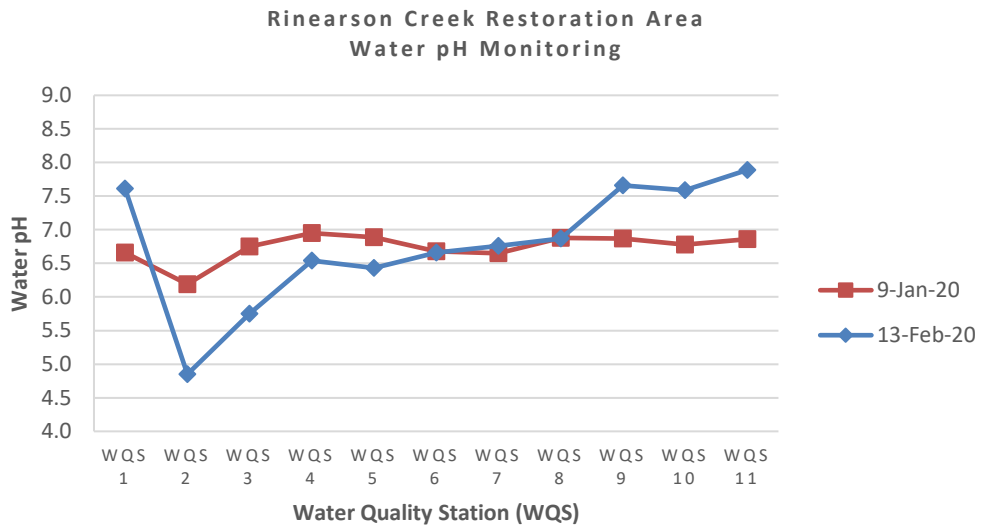


Figure 4. pH monitoring results.

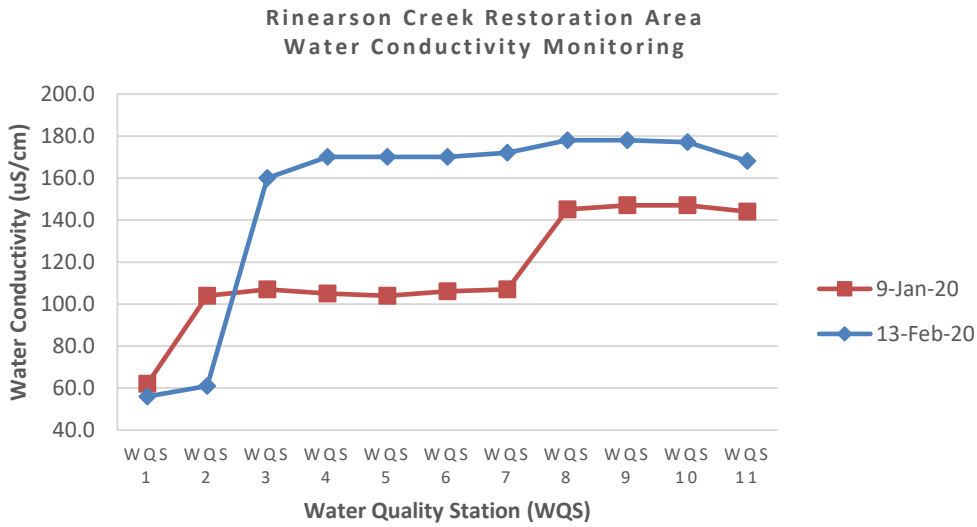


Figure 5. Water conductivity monitoring results.