



SPR Quarterly Progress Report
April 1, 2008 through June 30, 2008

Date June 30, 2008

TO: Technical Advisory Committee Members:

Miguel Estrada, ODOT
Michele Eraut, FHWA
William Fletcher, ODOT, Research Proposer
Charlotte Kucera, ODOT
Devin Simmons, NMFS

FROM: Matthew Mabey, Research Coordinator (ph: (503) 986-2847)

1. Project

Copper Toxicity and ESA Listed Salmon
SPR # 663

2. Key Dates

Start Date for ODOT: September 10, 2007
Completion Date for ODOT: October 31, 2009

3. Principal Investigator

Jeffrey A. Nason
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4. Progress

- The project team met with the TAC on 4/10/2008 to discuss literature review and draft sampling plan that had been submitted last quarter. The meeting was very productive in that the priority of the objectives in the original work plan were clarified and it was agreed that Objectives (1) and (2) from the original work plan were of highest importance. The TAC was in general agreement with our suggested modifications to the original sampling plan (fewer monitoring sites and temporal sampling, at least initially, during individual storms). It was agreed that the sampling program should consist of detailed, temporal sampling at one or two dedicated sites in

order to get the high quality data necessary to satisfy Objectives (1) and (2). Grab samples will be collected at several other sites (number and location to be determined) for qualitative comparison with the primary monitoring sites; the aim of the grab sampling is to provide a window into the variability of copper speciation across the Oregon highway system (Objective 3).

- We have collected grab samples of stormwater from two sites in Corvallis and received one composite sample from the I-5 sampling site in Portland. We have analyzed the samples for all water quality characteristics outlined in the work plan, with the exception of copper speciation using the voltammetric techniques (see below). Dissolved copper has been found in the low microgram/L range in all samples.
- A list of potential stormwater monitoring sites was sent to the TAC for comment on 6/19/08 and we are awaiting a response. We proposed to install a continuous monitoring site on Hwy 20 in Corvallis and to coordinate receiving some fraction of the composite samples collected by Herrera at the I-5 site in Portland, the site in Bend, and the site proposed for Hwy 26. A few potential grab sampling locations were also identified.
- Graduate students have made great progress in the lab and have become comfortable with all of the analytical techniques used for general stormwater characterization. They have also made steady progress working out the analytical methods for the voltammetric titrations to be used for the measurement of copper speciation. They are currently working on testing the methodology with samples containing known concentrations of binding ligands (EDTA).
- We are working with ODOT (Jeff Moore) and the City of Corvallis to identify potential sampling locations on Hwy 20 in Corvallis. We are also preparing to purchase the appropriate sampling equipment necessary to set up the continuous monitoring site.

5. Problems

- Initial trials with wet digestion procedures for the destruction of natural organic matter in stormwater samples did not yield the results we had hoped. Most wet digestion procedures are undesirable for trace metals work because of the high propensity for sample contamination and the necessity of using large volumes of oxidants (e.g., acids and persulfate). As a result, we have purchased a UV digestion apparatus to perform the digestion procedures necessary for determination of dissolved and free ionic copper in stormwater samples. Unfortunately, the item was on back order and we will be receiving the unit in the next week or so. As a result of this delay, we have not been able to perform the speciation analysis on the grab and composite samples collected over the last quarter. The unit is due to arrive in the next week and analysis will be performed then.
- In discussions at our meeting with the TAC it was suggested that there were possibly some automated samplers that could be used in our project. It turns out that those samplers are tied up on other projects. We are currently pursuing options for purchase or lease of the necessary equipment.

6. Work Planned for Next Quarter

- We will continue to test the analytical method with synthetic (EDTA) and natural waters. We will use local surface waters and surface waters spiked with copper for this testing. Due to the limited rainfall events in the summer, we don't anticipate having a great number of stormwater samples to analyze. Of course, all efforts will be made to collect grab and composite samples when available.
- We hope to finalize the location of sampling sites and the overall sampling plan. This work will include purchase and setup of the equipment necessary for collecting discrete temporal samples at the continuous monitoring site, once that location has been decided. We are continuing to investigate the best sampling sites as well as the availability of rain gauge data at those locations.
- We will continue discussions with William Fletcher, Jeff Moore, and engineers at Herrera to finalize coordination of sampling at the three sites included in their sampling effort.
- Based on preliminary data, we will begin to make comparisons of copper speciation measured experimentally with equilibrium speciation models.

7. Finances

SPR Project Summary

VENDOR	FY'08	FY'09	FY'10	FY11	TOTALS
ORIGINAL BUDGET	\$ 120,000	\$ 240,000	\$ 28,000		\$ 388,000
REVISED BUDGET	\$ 115,555	\$ 180,846	\$ 91,803		\$ 388,204
EXPENDITURES - VENDOR	\$ 21,701	\$ -	\$ -	\$ -	\$ 21,701
BALANCE	\$ 93,854	\$ 180,846	\$ 91,803	\$ -	\$ 366,503

ODOT	FY'08	FY'09	FY'10	FY11	TOTALS
ORIGINAL BUDGET	\$ 4,000	\$ 5,000	\$ 3,000		\$ 12,000
REVISED BUDGET	\$ 5,500	\$ 5,000	\$ 3,000		\$ 13,500
EXPENDITURES - ODOT	\$ 4,809	\$ -	\$ -	\$ -	\$ 4,809
BALANCE	\$ 691	\$ 5,000	\$ 3,000	\$ -	\$ 8,691

PROJECT	FY'08	FY'09	FY'10	FY11	TOTALS
ORIGINAL BUDGET	\$ 124,000	\$ 245,000	\$ 31,000	\$ -	\$ 400,000
REVISED BUDGET	\$ 121,055	\$ 185,846	\$ 94,803	\$ -	\$ 401,704
EXPENDITURES - PROJECT	\$ 26,510	\$ -	\$ -		\$ 26,510
BALANCE	\$ 94,545	\$ 185,846	\$ 94,803	\$ -	\$ 375,194