



**SPR Quarterly Progress Report**  
July 1, 2008 through September 30, 2008

Date September 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**

- We received the UV digester that was ordered last quarter and began testing to determine optimum operating conditions for digestion of natural samples. Preliminary tests have been run with acetate, phthalate and natural samples and preliminary results are very promising. Comparison of total dissolved copper concentrations measured using ICP-MS and the competitive ligand exchange voltammetric technique following UV digestion were very similar.
- We have continued to test and refine the analytical method for copper speciation. After much experimentation, I believe we have honed in on a reliable set of operating

procedures. As stated above, the methodology has yielded total dissolved copper concentrations very close to those measured via ICP-MS. We are continuing to work on the calibration of the speciation methodology with EDTA.

- We identified two possible sites in the Corvallis area for continuous stormwater sampling. One site was on Hwy 20 just north of Corvallis and the other was on Hwy 20/34 just east of Philomath. Grab samples were collected from both sites and the waters were fully characterized with the exception of copper speciation. Both sites had similar total and dissolved copper concentrations (in the 10-20 ppb range). The site on Hwy 20 north of Corvallis was determined to be the better site in terms of access and ease of installation of the sampling equipment. The decision was made to use the Hwy 20 site and the TAC was notified and comments were solicited. No negative comments were received.
- We purchased an automated sampler, flow meter, and rain gauge for installation at the continuous monitoring site. We have begun testing and calibration of the instruments in advance of installing them in the field. We have also begun construction of an HDPE enclosure to secure the equipment at the site.
- We have been in contact with ODOT Maintenance in Corvallis to secure the proper permits for installation of the sampling equipment in the right-of-way.
- We have been in communication with Herrera and have an agreement to receive samples from the three sampling locations that they are currently operating in Portland, Bend and Welches.

## 5. **Problems**

- As mentioned in last quarter's report, there was a substantial delay in the arrival of the UV digestion apparatus that we purchased last quarter. Furthermore, when the unit did finally arrive, only half of the equipment was shipped, leading to further delay. When the instrument was finally set up it was not operational and some internal parts needed to be replaced. We do have the instrument up and running, however there was a substantial delay
- We have continued to struggle somewhat with devising reliable operating procedures for the voltammetric technique to be used to determine copper speciation. After trials with several different sample containers and operating conditions, I believe we have arrived at a set of working procedures. Preliminary results using the methodology to determine total dissolved copper concentrations have been successful. However, we are still in the process of testing and calibrating the method for use in determining copper speciation. Although we have made great progress in this area, this process has taken longer than anticipated.

## 6. **Work Planned for Next Quarter**

- Finalization of the testing and calibration of the voltammetric technique for measurement of copper speciation.
- Installation of the automated sampling equipment at the Hwy 20 site in Corvallis.

- Collection and complete analysis of grab and continuous samples from the Corvallis site.
- Receipt and complete analysis of composite samples from the Herrera sampling sites.
- Preliminary equilibrium modeling and comparison with field results.

**7. Finances**

**SPR Project Summary**

<b>VENDOR</b>	<b>FY'08</b>	<b>FY'09</b>	<b>FY'10</b>	<b>FY11</b>	<b>TOTALS</b>
ORIGINAL BUDGET	\$ 120,000	\$ 240,000	\$ 28,000		\$ 388,000
<b>REVISED BUDGET</b>	\$ 89,592	\$ 180,846	\$ 117,766		\$ 388,204
EXPENDITURES - VENDOR	\$ 89,592	\$ -	\$ -	\$ -	\$ 89,592
<b>BALANCE</b>	\$ -	\$ 180,846	\$ 117,766	\$ -	\$ 298,612

<b>ODOT</b>	<b>FY'08</b>	<b>FY'09</b>	<b>FY'10</b>	<b>FY11</b>	<b>TOTALS</b>
ORIGINAL BUDGET	\$ 4,000	\$ 5,000	\$ 3,000		\$ 12,000
<b>REVISED BUDGET</b>	\$ 5,044	\$ 5,000	\$ 3,000		\$ 13,044
EXPENDITURES - ODOT	\$ 5,044	\$ 264	\$ -	\$ -	\$ 5,308
<b>BALANCE</b>	\$ -	\$ 4,736	\$ 3,000	\$ -	\$ 7,736

<b>PROJECT</b>	<b>FY'08</b>	<b>FY'09</b>	<b>FY'10</b>	<b>FY11</b>	<b>TOTALS</b>
ORIGINAL BUDGET	\$ 124,000	\$ 245,000	\$ 31,000	\$ -	\$ 400,000
<b>REVISED BUDGET</b>	\$ 94,636	\$ 185,846	\$ 120,766	\$ -	\$ 401,248
EXPENDITURES - PROJECT	\$ 94,636	\$ 264	\$ -		\$ 94,900
<b>BALANCE</b>	\$ -	\$ 185,582	\$ 120,766	\$ -	\$ 306,348