



# Oregon

## Oregon Watershed Enhancement Board

775 Summer Street NE, Suite 360

Salem, OR 97301-1290

(503) 986-0178

FAX (503) 986-0199

[www.oregon.gov/OWEB](http://www.oregon.gov/OWEB)



## MEMORANDUM

**TO:** Oregon Watershed Enhancement Board

**FROM:** Ken Fetcho, Effectiveness Monitoring Coordinator

**SUBJECT: Agenda Item F: Funding Request for the Upper Middle Fork John Day Intensively Monitored Watershed October 27-28, 2015 OWEB Board Meeting**

### I. Introduction

This report provides an update regarding the Upper Middle Fork John Day River Intensively Monitored Watershed (IMW) and requests the Board approve \$100,874 for ongoing monitoring activities of the IMW.

### II. Background

At its July 2015 meeting, the Board approved receipt of funding that had been provided by the Pacific States Marine Fisheries Commission (PSMFC) to OWEB in support of the IMW. This funding, which PSMFC has provided for several years in support the IMW, was delegated to the Executive Director for distribution. The funds will support ongoing monitoring activities from October 2015 through September 2016.

Since the 2007 inception of the IMW, the Board has provided additional funding in support of critical aspects of this large monitoring study. These funds complement the PSMFC contributions. The Board's investment has allowed priority monitoring work to occur that helps answer important watershed-scale questions that are being addressed by the study objectives.

Examples of activities funded with past Board investments include:

- Geomorphology and groundwater monitoring,
- Water-quality sampling using fiber optic cables, and
- PacFish/InFish Biological Opinion (PIBO) landscape-scale systematic surveys.

Most recently, in March of 2015, the Board approved funding to support the North Fork John Day Watershed Council (NFJDWC) to perform water temperature, streamflow and macroinvertebrate monitoring, and for the Washington State University (WSU) to study the relationships between habitat restoration and effects to the biotic community through analyzing the macroinvertebrate data sets collected by the NFJDWC.

This report requests funding from the Programmatic Effectiveness Monitoring for Open Solicitation line item in the spending plan for the NFJDWC, WSU, Oregon State University

(OSU), University of Oregon (UO), and the Confederated Tribes of Warm Springs of Oregon (the Tribes) in support of their respective roles in the IMW for the next year.

### **III. IMW Roles and Responsibilities**

The NFJDWC performs water temperature, macroinvertebrate, and streamflow monitoring. This work is central to the IMW goals of evaluating the baseline conditions and trends in water temperature, macroinvertebrate communities, and overall water yield that may result from watershed restoration work (within the context of natural variability). Other responsibilities include reporting, data management, and coordination.

WSU's involvement includes analyzing macroinvertebrate datasets collected by the NFJDWC and PIBO. They are developing models to calculate the biotic integrity of streams for the region using the observed/expected ratio. Status and trends of ecological function associated with implemented restoration projects will be statistically analyzed over multiple years.

The OSU team has several roles in the project: monitoring a set of reaches for temperature dynamics during the low-flow season with fiber-optic cables; monitoring floodplain phreatic (i.e., aquifer) elevations; assisting in flow measurement in the mainstem river and selected tributaries; monitoring micro-meteorological conditions along the IMW reaches; managing and interpreting data collected in these efforts.

UO's focus of this project is to monitor and evaluate restoration action effectiveness in regard to geomorphology and physical habitat. Based on goals stated for the restoration projects, a set of monitoring indicators was defined in 2008. Many indicators are monitored by field measurements collected by the UO team, but in some cases indicators are monitored using remote sensing techniques or field data collected by other parties.

The Tribes provide facilities and support for visiting researchers and IMW partners. They also assist the other organizations with monitoring and recording stream/river temperatures, meteorological data, ground and surface water levels. In addition, the Tribes coordinate the public website for the IMW—<http://www.middleforkimw.org/>—to inform the local community and broader public about the activities and findings of the IMW.

Specific information about each organization's scope of work is found in Attachment A.

### **IV. Recommendation**

Staff recommend the Board award up to \$100,874 in support of the Intensively Monitored Watershed from the Programmatic Effectiveness Monitoring for Open Solicitation line item in the spending plan and delegate authority to the Director to enter into appropriate agreements, with an award date of October 27, 2015.

Attachment

A. 2015-2016 Scopes of Work for IMW partners

**Upper Middle Fork John Day Intensively Monitoring Watershed**

**2015-2016 SCOPES OF WORK**

**North Fork John Day Watershed Council**

**Temperature Monitoring**

The watershed council is in charge of deploying and collecting 43 temperature loggers along the mainstem Middle Fork and its tributaries. Loggers will be deployed in April and then collected in November.

**Macroinvertebrate Monitoring**

Between the months of July and October, both benthic and drift macroinvertebrate samples will be collected. Benthic macroinvertebrate sampling is conducted on the South and Middle forks of the John Day River (the South Fork is used as a reference for the Middle Fork). On each river, there are 10 sampling sites.

**Discharge Monitoring**

Discharge monitoring occurs at 12 sites along the mainstem Middle Fork and its tributaries. Gaging stations will be installed at each site in April and the loggers will then be deployed at the gaging stations. In order to develop a rating curve for each site, discharge will be measured a minimum of 9 times (though likely more) throughout the spring and summer using a Marsh McBirney flow meter.

**Reporting, Data Management, Meetings and Miscellaneous**

Reports will be completed and turned in by NFJDWC staff to include: Quarterly Reports, Biannual Website Updates, and a Final Completion Report. NFJDWC staff will also attend the biannual Face to Face meeting where we will provide a presentation on the work they have accomplished to date. Other meetings with members of the IMW will be attended as required, and NFJDWC staff will conduct and/or attend training to better fulfill requisite roles.

**IMW Wrap-up and Data Finalization**

This funding will support year 9 of the IMW, which will culminate at year 10. Data collected will need to be compiled and organized to create an overall, readable dataset that can be presented with lessons learned, discoveries made and any observations or important take-aways. The NFJDWC will be pivotal in this effort by providing data that will be collected, organization of this data, creating meta-data for release, and providing local connection to the area and the data that has been collected.

**Confederated Tribes of the Warm Springs Reservation of Oregon**

**Oxbow Research Monitoring Station (ORMS) maintenance and support**

The Tribes will continue to provide facilities for visiting researchers and IMW partners. Campers and visitors will also be allowed use of the RVs and toilet facility. Wireless Internet is also

provided for researchers, IMW partners and visitors. Funds will be used to help pay for electricity, phone, propane, cleaning supplies, and maintenance/repair costs of the RV facilities as well as employee salaries to do maintenance and coordination for the ORMS.

### **Monitoring**

The Tribes will continue to monitor and record stream/river temperatures, weather data, groundwater wells, and staff gauge data. The Tribes currently have 16 temperature loggers, one weather station, nine staff gauges, and three groundwater wells on both the Middle Fork Forrest and Oxbow properties. Groundwater wells are checked weekly to monthly depending on the time of year, as well as the staff gauges. Data from temperature loggers is downloaded at least once a year and given to the NFJDWC, who manages the data. Funds will be used to pay salaries for these monitoring activities and any replacement temperature loggers needed.

### **IMW Website**

Funds will go towards yearly domain and hosting fees as well as updates and changes made to the website. The Tribes are currently working on some changes to the website to make it more user-friendly and engaging to funders and non-scientists—it is likely that work on these changes will progress well into the 2015-2016 fiscal year.

### **Camp Creek Gauge Station**

The Tribes will use funds to contract with USGS for maintenance and data gathering on the Camp Creek gauge station site. Work to perform yearly equipment maintenance and data gathering will be split between the Tribes and USGS, with the stream flow data made available via the USGS stream flow website.

### **Washington State University**

In line with the goals of the IMW to understand the causal mechanisms between stream habitat restoration and changes in fish production at the watershed scale, macroinvertebrate monitoring was initiated in 2009 to determine biological responses to restoration activities. Based on the needs of the Middle Fork IMW to analyze both the benthic and drift macroinvertebrate results in preparation for the final report in 2017, WSU PhD candidate Robin Henderson proposes to assist the Middle Fork IMW in April 2016 to April, 2017 with the analysis of these macroinvertebrate results.

Specific objectives will be the following:

1. Has the biotic integrity of the Middle Fork John Day River improved following management actions by including the data from 2014 and 2015?
2. Determine if the PIBO and NFJDWC samples are comparable following the completion of resolving the taxonomy.
3. Determine how restoration activities affects the passive drift of macroinvertebrates following the completion of resolving the taxonomy.

Stream restoration can be most effective when target-oriented, systematic, and integrative approaches are used to measure restoration outcomes; however, without adequate effectiveness

monitoring, we cannot learn from our mistakes, and the science will not advance. Therefore, by monitoring the biological integrity of streams before and after restoration, this research will:

- Ascertain if restoration actions impact the biotic integrity of stream ecosystems.
- Determine how restoration affects the variability of biotic indices.
- Provide insight into the niche axes that partition taxa among sites in the Middle Fork John Day River.
- Advance the quality of environmental inquiry as well as environmental decision-making with regards to stream restoration.

### **Oregon State University**

In the period of October 1, 2015 to September 30, 2016, the OSU team proposes to visit the site for data downloading from all wells and well depth data loggers. The team will install fiber optic sensing in the key reaches of the Middle Fork of the John Day in the summer of 2016. As always, these data will be published on the NOAA data site. The team will carry out fiber optic monitoring program in August of 2016. Data collection in the summer of 2016 will also include weather station, and well temperature-pressure loggers.

Also during the year the team will participate in monthly teleconference calls, and the bi-annual face-to-face meetings. Administratively, the team will continue to provide quarterly reports, biannual website updates, and commit to providing a final completion report for the project.

### **University of Oregon**

The following tasks will be completed from October 1, 2015 to September 30, 2016:

- a) Enter, quality-check and analyze data from the three reaches. Produce maps and graphics, and a report summarizing changes in these reaches since 2008 and 2009.
- b) Compile the 2008 stream survey data and summer 2015 repeat field measurements of pool depth in GIS and analyze these data.
- c) Continue to refine metadata to ensure that it is in good shape for the end of the project. This task will be accomplished by the graduate research assistant (with overall supervision by the project director). The project director will take the lead in report writing, with support from the GRA.

In addition to the monitoring indicators collected directly in the field by the UO team, data from several other sources, including monitoring indicators derived from imagery, and PIBO data, will be analyzed.

- a) Extend GIS analysis of sinuosity to 2013 using the imagery from the SfM helicopter flight. Preliminary analysis using imagery from 2006 to 2011 was completed in 2015.
- b) Analyze planform change in log structures from aerial imagery.
- c) Access some earlier data sets from the 1990s that may be suitable for analysis with the 2006-2013 data, allowing a longer historical time perspective on channel adjustment and response to post-2006 restoration activities, and attempt this analysis.

- d) Analyze the PIBO data in comparison to UO field data for change over time. This task will be accomplished by the graduate research assistant, with overall supervision by the project director.

During summer 2016, the following field tasks will be completed:

- a) Final monitoring of the three remaining study reaches, BEBU, RABE and JUCA, originally surveyed in 2009, 2009 and 2010 respectively.
- b) Baseline monitoring by photography for SfM in new channel constructed in 2016, as appropriate.
- c) Completion of residual pool depth and other field measurements.