August 8, 2023

MEMORANDUM

TO: Council Members

FROM: Mark Fritsch

SUBJECT: Update on Project #1992-026-01, Grande Ronde Model Watershed

BACKGROUND:

Presenter: Jesse Steele, Executive Director, Grande Ronde Model Watershed (GRMW)

Summary: Jesse will provide an update and overview of the accomplishments administered by this project that coordinates watershed restoration within the Grande Ronde River and Imnaha River subbasins of Northeastern Oregon. The watershed activities are focused on habitat protection, restoration and enhancement for salmon and steelhead and other native fishes, while encouraging and supporting land and water management, economics, and multiple land uses consistent with sound ecosystem management.

This presentation was requested as part of the Council recommendation associated with the Anadromous Fish Habitat and Hatchery Review in April 2022. The periodic presentation is intended to provide an update on the project’s accomplishments and results. No decision is needed at the meeting.

Relevance: Project #1992-026-01, Grande Ronde Model Watershed is one of the seven umbrella projects supported by the Fish and Wildlife Program. The

1 see page 2 for information regarding the Program’s umbrella projects.
The project uses a comprehensive watershed management approach, using structured and science-based decision tools to enhance implementation of on the ground activities, resolve conflicts, and formulate priorities for action.

**Workplan:** Fish and Wildlife Division work plan 2023; Program planning & coordination.

**Background:** The GRMW Program is located in the Blue Mountain Province and incorporates the Grande Ronde River and Imnaha River subbasins. The area includes 5,265 square miles of land and over 4,000 stream miles of salmonid habitat in Oregon’s Union and Wallowa Counties as well as a portion of Asotin County, Washington. Approximately 54 percent of the Grande Ronde Subbasin and 30 percent of the Imnaha Subbasin are privately owned.

Established in 1992, the GRMW’s goal is to develop and oversee the implementation, maintenance and monitoring of coordinated watershed enhancement and restoration activities. At that time, the Grande Ronde River was selected by the Council as the model watershed project in Oregon managed by a Board of Directors, composed of local representatives and agency personnel involved with the multiple uses of natural resources within the basin.

As a model watershed, the GRMW was designed to serve as an example for the establishment of watershed management partnerships among local residents, state and federal agency staff, and public interest groups concerned with the management of a watershed at a locally-based effort to improve coordination, integration, and implementation to effectively protect and restore fish and wildlife habitat, improve water supply and quality, and foster community development within the region.

**Umbrella Projects**

Umbrella projects are a smaller subset of the projects (#7) currently being implemented through the Program. These umbrella projects are unique, because of the coordination role they play in a particular sub-region, and also because of their approach to their implementation in offering a solicitation and review process that can fund local entities to implement projects. The funding, review and selection process is much like a mini-grant program for the area. The science review that would normally occur through an Independent Science Review Panel (ISRP) review occurs at the local level with ISRP-reviewed criteria and local technical teams. While the processes differ slightly in each area the umbrella projects under this recommendation are largely defined by their approach to: 1) serve as a coordinating entity among sponsors in a particular sub-region to identify, review, and select projects; 2) use a formal project solicitation process;
and 3) allocate and administer Bonneville funds to other entities for implementation.

In 2013, as part of the Geographic Category Review in 2013, the Council formalized and established a set of principles to guide umbrella habitat projects were identified and discussed in the review decision document as Programmatic Issue B - *Evaluate and Improve Umbrella Projects*. Umbrella projects are a unique subset of the habitat projects implemented through the Program because of the coordination role they play in a particular subregion and their offering of a project solicitation and review process that can result in local entities implementing habitat projects with Program funds.

All the Program’s Umbrella Projects (except the lamprey project\(^2\)) were part of the recently completed Anadromous Fish Habitat and Hatchery Review in April 2022. As part of the Council decision associated with this review the Council confirmed the importance of the umbrella projects and the principles as established in 2013 and 2017, with the exception that the report that was requested by Council annually (i.e., Principle #6) will no longer be a required, but requested that the sponsors of the umbrella projects present to the Council biennially on their accomplishments and results at appropriate times for the region.

More Info:
- Grande Ronde Model Watershed [website](#)
- BPA [Annual Report 2022](#)
- Publications
  - [A comparison of methods for estimating juvenile salmon habitat capacity to assist with restoration planning and evaluation](#)

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\(^2\) In 2017, Project #2017-005-00, Pacific Lamprey Conservation Initiative was included with the original umbrella projects. It is implemented with the guidance established in the Council’s 2013 recommendation through the established principals for the benefit of Pacific Lamprey.
The mission of the Grande Ronde Model Watershed Program is to develop and oversee the implementation, maintenance and monitoring of coordinated resource management that will enhance the natural resources of the Grande Ronde River and Imnaha River Basins.
Outline

• Grande Ronde Partnership
• History of GRMW Program
• Restoration Prioritization in the Grande Ronde and Imnaha Basins
• Recent Accomplishments
  • Projects & Project Evaluations
  • Outreach
  • Assessments
• Future Work
History of Oregon’s “Model Watershed”

- 1991 - Northwest Power & Conservation Council (Formed by the Power Act) recommended a **locally led** effort to habitat restoration
  - Model Watersheds in OR, ID, WA
- 1992 - designated ‘Model Watershed’ by Governor Barbara Roberts and NPCC
- 1992 - Union and Wallowa County Commissioners appointed GRMW Board of Directors and hired an executive director.
➢ 3,000,000+ acres
➢ ~4,000 miles of salmonid bearing waterways
The Atlas Structure

- Assemble Data
- Define Biologically Significant Reaches (BSRs)
- Score and Prioritize BSRs Utilizing Assembled Data
- Map Restoration Opportunities
- Score and Prioritize Mapped Opportunities
- Review Opportunities and Assign Opportunity Leads

The Stepwise Process

- Create Prospectus with Implementation Team
- Review Prospectus
- IT Feedback
- Proposal Phase – Submit Draft Proposal
- Site Visit & Technical Review
- Proposal Phase – Revise & Submit Final Proposal
- Board Decision
- Approval for Funding (Yes/No)

<table>
<thead>
<tr>
<th>BSR Name</th>
<th>Condition</th>
<th>Geomorphic</th>
<th>Periodicity</th>
<th>Fish use</th>
<th>Total Score</th>
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<tbody>
<tr>
<td>UGR 17</td>
<td>25</td>
<td>3</td>
<td>22</td>
<td>24</td>
<td>99</td>
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<td>25</td>
<td>0</td>
<td>22</td>
<td>24</td>
<td>96</td>
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<tr>
<td>UGR-19</td>
<td>25</td>
<td>0</td>
<td>23</td>
<td>25</td>
<td>98</td>
</tr>
<tr>
<td>Metric</td>
<td>Calculated from</td>
<td>Before</td>
<td>After</td>
<td>Δ%</td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Floodplain area (m²)</td>
<td>Floodprone width</td>
<td>181,665</td>
<td>209,410</td>
<td>+15%</td>
<td></td>
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<tr>
<td>Floodplain inundation index</td>
<td>Floodprone width</td>
<td>82.63</td>
<td>96.80</td>
<td>+17%</td>
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<tr>
<td>Number of side channels</td>
<td>Bankfull width</td>
<td>8</td>
<td>13</td>
<td>+63%</td>
<td></td>
</tr>
<tr>
<td>Side channel length (m)</td>
<td>Bankfull width</td>
<td>1393</td>
<td>2082</td>
<td>+49%</td>
<td></td>
</tr>
<tr>
<td>Side channel area (m²)</td>
<td>Bankfull width</td>
<td>10,225</td>
<td>16,951</td>
<td>+66%</td>
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<tr>
<td>Residual pool depth (m)</td>
<td>Thalweg profile</td>
<td>0.47</td>
<td>0.54</td>
<td>+15%</td>
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<tr>
<td>Sinuosity</td>
<td>Thalweg profile</td>
<td>1.37</td>
<td>1.42</td>
<td>+4%</td>
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<tr>
<td>River complexity index</td>
<td>Bankfull width</td>
<td>1.06</td>
<td>1.57</td>
<td>+49%</td>
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<tr>
<td>Bankfull width to depth ratio</td>
<td>Bankfull width</td>
<td>8.71</td>
<td>6.31</td>
<td>-28%</td>
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<tr>
<td>Morphological quality index</td>
<td>Bankfull width</td>
<td>0.84</td>
<td>0.86</td>
<td>+2%</td>
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<tr>
<td>Pool area (m²)</td>
<td>Bankfull width</td>
<td>2,590</td>
<td>2,893</td>
<td>+12%</td>
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<tr>
<td>Percent pool</td>
<td>Bankfull width</td>
<td>11%</td>
<td>17%</td>
<td>+55%</td>
<td></td>
</tr>
<tr>
<td>Shannon diversity index</td>
<td>Bankfull width</td>
<td>0.64</td>
<td>0.73</td>
<td>+14%</td>
<td></td>
</tr>
</tbody>
</table>
Upper Grande Ronde River Bowman Project and Middle Upper Grande Ronde River Restoration 2023
Sheep Creek Restoration
2013-2023
Wallowa River
Wilson-Haun Restoration Project
2021
QAPQÁPNIM WÉELE / GRANDE RONDE COMMUNITY SCIENCE PROJECT

We are a community of scientists investigating how the Grande Ronde Watershed is changing over time.

**GOALS**

1. Youth see themselves as scientists and stewards of their environment.
2. Our Indigenous neighbors guide the project using their deep understanding of our watershed.
3. Participants monitor stream restoration sites throughout our watershed.

**WHY**

- Youth deserve opportunities to learn in nature.
- Diverse restoration and monitoring strategies are necessary for long standing watershed health.
- Career connected learning and STEAM opportunities abound in watershed education.

**WHO WE ARE**

As of 2022

- 737 Community Scientists
- Monitored 16 Sites
- From 11 Schools

QAPQÁPNIM WÉELE IS THE COTTONWOOD STREAM.

[Logos and partnerships mentioned]
Technical Assessments – Fish Predation in the Grande Ronde Valley

Length Distribution

- Yellow Perch
- White Crappie
- Smallmouth Bass
- Redside Shiner
- Pumpkinseed
- Northern Pikeminnow
- Largescalar Sucker
- Largemouth Bass
- Common Carp
- Chiselmouth
- Brown Bullhead
- Bridgelip Sucker

Length (mm)
Grande Ronde Valley Water Quality Assessment

- 2 year contract with Anderson Perry & Associates due to end in 2022
- 10 sample site locations; 5 samples per year at predefined intervals
- The copper exceedances listed in the table are at the acute level
  - >5.5 = acute
  - >4.1 = chronic level

<table>
<thead>
<tr>
<th>Site</th>
<th>Site Description</th>
<th>Sampling Dates</th>
<th>WQ Exceedances</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>Catherine Creek below the Union Wastewater Treatment Plant (WWTP) Outfall (CCUB)</td>
<td>11/6/2020</td>
<td>copper = 14.6</td>
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<tr>
<td></td>
<td></td>
<td>1/13/2021</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>3/9/2021</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>4/25/2021</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>8/2/2021</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Ladd Creek at Peach Lane (LCPL)</td>
<td>11/6/2020</td>
<td>dissolved oxygen</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1/13/2021</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>3/9/2021</td>
<td>copper = 33.7</td>
</tr>
<tr>
<td></td>
<td></td>
<td>4/25/2021</td>
<td>dissolved oxygen</td>
</tr>
<tr>
<td></td>
<td></td>
<td>8/2/2021</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Grande Ronde River in Island City (GRIC)</td>
<td>11/6/2020</td>
<td>copper = 22.2</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1/13/2021</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>3/9/2021</td>
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<td>4/25/2021</td>
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<td></td>
<td></td>
<td>8/2/2021</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Grande Ronde River at Market Lane (GRML)</td>
<td>3/9/2021</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>4/25/2021</td>
<td></td>
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<tr>
<td></td>
<td></td>
<td>8/2/2021</td>
<td>copper</td>
</tr>
<tr>
<td>7</td>
<td>Catherine Creek Market Lane Bridge (CCML)</td>
<td>3/9/2021</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>4/25/2021</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>8/2/2021</td>
<td>dissolved oxygen</td>
</tr>
<tr>
<td>10</td>
<td>Grande Ronde River near confluence with Fly Creek (GRFC)</td>
<td>3/9/2021</td>
<td>copper = 7.2</td>
</tr>
<tr>
<td></td>
<td></td>
<td>4/25/2021</td>
<td></td>
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<tr>
<td></td>
<td></td>
<td>8/2/2021</td>
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</tr>
</tbody>
</table>
UGR Sediment Budget Summary

UGR Implementation Team Meeting – July 21, 2022

Luke Russell, GIT, Nick Legg, RG, Colin Thorne, PhD (Wolf Water Resources)
Sean Welch, PE (BPA)
Study Goal/Methods

Understand sediment sources, sinks, and transfer to inform process-based restoration strategies and recovery timescales.

Apply SIAM tool as analytical, planning-level tool to understand these processes from watershed to reach scale.
Future assessments aimed at identifying causes of high mortality for juvenile Chinook salmon during the out-migration through the Grande Ronde Valley.

- Avian predation – 20%+ of smolts succumbing to avian predation in valley?
- Additional Non-native fish sampling w/ gastric lavage to identify rates of predation on Chinook salmon and steelhead.
- Water quality Phase 2
Questions
GRMW will lead the AM process in the Grande Ronde

Periodic overall review - Update entire Program and Atlases based on new data every 5 years

Reporting:
- Monthly IT meetings
- Annual State of Science (SOS) meeting and report
  - AEM
  - cbfish.org
  - OWRI
  - Annual reports

Evaluate effectiveness - Population and landscape level:
- Abundance
- Productivity
In development:
- Life cycle modelling
- LIDAR (green) – geomorphic unit tool

Evaluate effectiveness - Project level:
- GRMW – HSI, drone imagery classification
- AEM – Inform actions and indicators
- Partners – Habitat and snorkel surveys, Radio tracking

Project Development:
- Establish opportunity lead
- Implementation team (IT) review with continual feedback throughout the process
- Integration of Science TAC

Establish monitoring:
- Project – AEM, partner EM, HSI, habitat surveys
- Population – ODFW Fish Research, LCM
- Landscape – LIDAR, FDAT, habitat surveys

Implement - GRMW coordination and partner implementation of highest priority restoration actions with input from Atlas TAC, Atlas IT, and GRMW Board

ATLAS

Tier 1 objectives:
- Increase pool frequencies
- Increase LWD frequencies

Desired outcomes:
- Reduced pre-spawn mortality
- Decreased water temperatures
- Improved riparian condition

Performance indicators:
- Juvenile productivity
- Adult productivity

Adjust – Adjust objectives, reprioritize reaches and opportunities (Atlas), and adjust project designs based on new data (RM&E data, AEM, SOS report on key decisions)

Adjust – May need to adjust performance indicators to align with NPCC RM&E workgroup indicators

Atlas - Develop and prioritize restoration opportunities in Tier 1 reaches & passage projects.
<table>
<thead>
<tr>
<th>Metric</th>
<th>Calculation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Floodplain area</td>
<td>Floodprone area, which is determined using 2 times the average maximum bankfull depth</td>
</tr>
<tr>
<td>Floodplain inundation index</td>
<td>Floodprone area divided by the mainstem wetted centerline length</td>
</tr>
<tr>
<td>Side channel number, length, area, and ratio</td>
<td>Sum of the side channel wetted centerline lengths and areas</td>
</tr>
<tr>
<td></td>
<td>Sum of all the side channel bankfull centerline lengths divided by the mainstem bankfull centerline length (Beechie et al. 2017)</td>
</tr>
<tr>
<td>Residual pool depth</td>
<td>Maximum pool depth minus the pool tail crest in pool habitats, averaged across a reach for pools that the thalweg runs through (Lisle 1987)</td>
</tr>
<tr>
<td>Sinuosity</td>
<td>Divide the thalweg line length by the straight-line distance between the start and end points (i.e., top of site and bottom of site) of the thalweg (Rosgen 1994, 1996)</td>
</tr>
<tr>
<td>RCI (River Complexity Index)</td>
<td>$RCI = \left( S \times (1 + J) / \text{(reach length)} \right) \times 100$, where $S =$ sinuosity, $J =$ # of side channel bankfull junctions, reach length = mainstem wetted centerline length (Brown 2002)</td>
</tr>
<tr>
<td>Bankfull width to depth ratio</td>
<td>For each bankfull transect, divide the bankfull width by the maximum bankfull depth and average this ratio across transects within a reach (Rosgen 1996)</td>
</tr>
<tr>
<td>MQI (Morphological Quality Index)</td>
<td>Extensive calculation using field data: confinement, sinuosity, anastomosing index, braiding index, mean bed slope, mean channel width, dominant bed sediment, and others (Rinaldi et al. 2013, 2017)</td>
</tr>
<tr>
<td>Pool area and percentage</td>
<td>Sum of pool habitat area, total pool area divided by total wetted area</td>
</tr>
<tr>
<td>Shannon diversity index of habitat units</td>
<td>Shannon diversity index ($H$) of the channel units in the mainstem and side channels with habitat units delineated (Shannon 1948)</td>
</tr>
<tr>
<td>Large wood</td>
<td>Count of jams and individual pieces from aerial imagery (Beechie et al. 2017; Roni et al. 2020b)</td>
</tr>
<tr>
<td>Aggradation and degradation</td>
<td>Create a DEM of Difference (DoD) for the years of interest and calculate the areas of deposition and storage (Williams 2012)</td>
</tr>
<tr>
<td>Habitat Suitability Index (HSI)</td>
<td>Sum of weighted usable area (WUA) and normalized WUA by species and life stage based on hydraulic and HSI modeling</td>
</tr>
<tr>
<td>Change in fine-scale geomorphic units</td>
<td>Use geomorphic unit tool (GUT; Wheaton et al. 2015) to map fine-scale geomorphic units at bankfull depth and compare changes in units around design elements before and after restoration</td>
</tr>
</tbody>
</table>