



## Independent Scientific Review Panel

for the Northwest Power & Conservation Council  
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**Memorandum (2022-6)**

**August 1, 2022**

**To:** Guy Norman, Chair, Northwest Power and Conservation Council

**From:** Stan Gregory, ISRP Chair

**Subject:** Review of the Grande Ronde Model Watershed 2022 Synthesis Report

### Background

In response to the Northwest Power and Conservation Council's May 2, 2022 request, the ISRP reviewed the report, [The Grande Ronde Model Watershed: Integrating Science into Restoration Implementation and Adaptive Management \(GRMW 2022 Synthesis\)](#); for project #1992-026-01 and considered the accompanying [cover letter](#) from the GRMW. This ISRP review is part of a sequence of reviews of 1) the 2017 Umbrella Habitat Restoration Project proposal, 2) the 2018 GRMW Synthesis Report, 3) the 2021-2022 Anadromous Fish Habitat and Hatchery proposal, and 4) this 2022 GRMW Synthesis Report. Previous recommendations of the Council and the ISRP recommendations referenced in Council decision letters served as the context for this review.

This synthesis report was requested to address a condition that has spanned multiple reviews. The condition was originally placed on the project as part of the [June 2017 Council decision](#) regarding the performance review of the Fish and Wildlife Program's Umbrella Habitat Restoration Projects. Specifically, the Council recommended that the GRMW develop a synthesis report that assesses *"whether the actions and associated changes in the physical habitat have contributed to addressing limiting factors ... and addresses, in a manner suited to the role served by this project, ISRP comments and qualifications on M&E and adaptive management [see [ISRP 2017-2](#)]."* The Council also suggested that the GRMW Synthesis focus on habitat implementation rather than research, monitoring, and evaluation (RME); this implementation focus applied to all umbrella projects.

An important expectation for the synthesis was that the GRMW project would use available information and work with partners and other RME experts (e.g., ODFW, CRITFC) to provide a quantitative assessment of environmental progress and outcomes for the Grande Ronde Basin. Specifically, this collaboration could provide an initial evaluation of measurable/observable biological and physical changes and trends that could be related to past restoration actions

and/or inform future actions. While the ISRP expects some monitoring of restoration efforts, the monitoring and analysis conducted by the GRMW is not expected to achieve the same level of detail or sophisticated experimental design as research projects.

In response to the Northwest Power and Conservation Council's October 5, 2018 request, the ISRP reviewed an earlier synthesis report, *Grande Ronde Model Watershed Synthesis, 1992-2016* ([GRMW 2018 Synthesis](#) for project #1992-026-01) and considered the accompanying [cover letter](#) from the GRMW ([ISRP 2018-11](#)). Outlines and preparation for the GRMW 2018 Synthesis were informed by discussion at the ISRP's October 3-4, 2017 site visit with the GRMW team, its partners, and staff of the Council and Bonneville Power Administration (BPA). The overall purpose of the site visit was to address the Council's [recommendations](#) and the ISRP's qualifications from the Umbrella Project Review of the performance and effectiveness of the GRMW's project. The ISRP also provided comments on draft outlines for the synthesis that were shared by the GRMW. The ISRP's impressions of the site visit and comments on the outline were submitted to the Council's Fish and Wildlife staff in November 2017 ([ISRP 2017-11](#)).

The ISRP ([ISRP 2018-11](#)) concluded that the 2018 Synthesis Report did not address the Council's primary purpose in requesting a synthesis nor its primary directive to provide evidence that actions and associated changes in the physical habitat have contributed to addressing limiting factors. However, we recognized that BPA had not allowed the GRMW to use BPA funds to produce the Synthesis report, and that the GRMW had used external funds to hire a technical writer. The report developed a coherent and concise summary of the goals, organization, evolution, and number of projects implemented over the GRMW's history. The ISRP noted that development of the Grande Ronde Basin Atlas Process was a significant accomplishment and identified it as a useful spatial framework for tracking and prioritizing restoration actions for the Grande Ronde Basin. However, the ISRP also found that the Atlas was not yet achieving its full potential as a tool to aid in summarizing the relative proportion of major habitat types that have been improved by habitat restoration actions or the contributions of the GRMW to addressing limiting factors. The ISRP commended the GRMW for its progress related to development of an adaptive management process and development of life cycle models.

Most recently, in the [Council's April 15, 2022 decision letter](#) to the Bonneville Power Administration for the 2021-2022 Anadromous Fish Habitat and Hatchery (AFHH) Review, the Council recommended that the GRMW, "*Complete final response, by May 1, 2022, to ISRP review ([ISRP document 2018-11](#)) in regards to the Project's 25-year synthesis review.*" The ISRP review requested that the Synthesis Report should describe how the project has addressed limiting factors for key life stages. The ISRP explained that the purpose of the Synthesis Report is to understand the degree to which the GRMW has accomplished its ecological objectives, describe the development of its adaptive management process as an example for other projects, and provide critical information on effective methods and a landscape-level strategy for regional conservation. As described below, the ISRP finds that the current synthesis report addresses the topics of adaptive management and effective methods for regional conservation,

but it does not adequately address the topic of assessing ecological outcomes and the degree to which the project has addressed and improved limiting factors in the basin.

## ISRP Recommendation and Summary Comment

### **Recommendation: Meets Scientific Review Criteria – Conditional**

The ISRP’s “conditional” recommendation from the AFHH Review and recent reviews (2017) still applies. The ISRP finds that the 2022 Synthesis Report does not fully satisfy the condition. The ISRP considers the 2022 Synthesis Report incomplete because it does not evaluate the extent to which “actions and associated changes in the physical habitat have contributed to addressing limiting factors.”

The ISRP commends the GRMW for its continued efforts to address the Council’s recommendations to develop a synthesis of the GRMW’s development and accomplishments over the past 30 years. Its progress in developing an effective adaptive management process, in creating the Grande Ronde Basin Atlas Process, and in using a Stepwise Process for the design and prioritization of restoration actions is impressive. The ISRP sees the 2022 Synthesis Report not as a revised version of the 2018 Synthesis, but rather as a complementary report that 1) provides additional information on history, landscapes, project implementation, lessons learned, and adaptive management, and 2) describes a framework for future monitoring and evaluation to support adaptive management. The report is clearly written and presents a potential approach for future monitoring and adaptive management.

Nevertheless, the 2022 GRMW Synthesis Report is incomplete because it does not provide evidence that actions and changes in physical habitat have addressed and improved limiting factors. In 2017, the ISRP indicated that ample information and evidence of contributions to addressing limiting factors were available at that time. Even more information is available now, including summary data in the Atlas, published results of the life cycle models, and results and analyses in reports and proposals of cooperators in the basins. Relevant analyses presented by cooperators and other researchers at the GRMW State of the Science meetings were not included in this synthesis. Even though the GRMW may not be responsible for the data collected by other projects, they have a responsibility, by the nature of their position as an umbrella project, to understand and communicate the key findings. As a case study and potential future approach, the 2022 GRMW Synthesis Report includes a useful description of the outcomes of the Woodlee project (Figures 7-9, Table 11). The approach illustrated in the case study is promising and could be expanded in the future. In the meantime, the summary of progress toward addressing and improving limiting factors can be completed with available information.

The ISRP believes the GRMW could provide evidence that their actions have addressed limiting factors by summarizing 1) the spatial extent and proportion of the targeted habitat conditions

that the GRMW has attempted to restore and 2) the major findings in the 78 papers and technical reports specifically related to the Grande Ronde Basin (see Figure 6 in the 2022 GRMW Synthesis Report). Such summaries would not require complex analyses or waiting for the future analyses described in the 2022 GRMW Synthesis Report. Other syntheses in the Fish and Wildlife Program could provide useful examples, such as the integrated habitat reports of the Upper Columbia River Salmon Recovery Board (UCSRB 2014a, 2014b). See the ISRP Comments section below for more specific details on sources of information and approaches for synthesis.

The 2022 GRMW Synthesis Report clearly explains that there are many purposes for syntheses of information and assessments of the benefits to fish and wildlife (p. 34), but indicates that evaluating the status, trends, and recovery of ESA listed fishes is beyond the scope of the existing GRMW program. The ISRP agrees.

As indicated in the 2021-2022 AFHH review, the ISRP appreciates the dialogue we have had with the GRMW in recent years. It has improved our understanding of the accomplishments and evolving challenges that the GRMW has encountered over three decades of restoration efforts. We have learned much about the history, successes, and leadership of the GRMW and see great potential for the project to evaluate their progress in addressing limiting factors using available information and data from nearly 30 years of research and monitoring. We continue to be available to discuss the completion of GRMW's evaluation of their contributions to addressing limiting factors.

## ISRP Comments on Major Synthesis Sections

### **Introduction**

The ISRP commended the 2018 Synthesis Report for thoroughly summarizing the GRMW's institutional evolution and the history and modifications of the program through time. We found the forthright details of early disagreements about strategy (assessment vs immediate action) and their transition toward a science-based system of prioritization targeting limiting factors to be particularly valuable lessons for other projects in the Fish and Wildlife Program. The 2018 Synthesis was more detailed and informative about the landscape context for the GRMW than the 2022 Synthesis, including describing and listing the number of projects dedicated to specific limiting factors (flow quantity, riparian conditions, stream complexity, fine sediment, streambank erosion, water quality, large wood, pool formation, winter ice, unscreened diversion and fish passage, temperature). For example, the 2022 report does not discuss winter conditions or "upslope" factors that influence riparian and instream conditions, such as roads, vegetation conditions, and invasive plants.

The 2022 Synthesis Report provides information on restoration and RME efforts in regional programs beyond the Columbia River Basin and Northwest Power and Conservation Council, such as the Pacific Coast Salmon Recovery Program. This larger context makes it clear that the challenges the GRMW faces in evaluating the outcomes of their collective efforts are common to restoration efforts throughout the Pacific Northwest. Though it does not directly address the synthesis of the GRMW program, this addition links the proposed framework for the GRMW to broader regional efforts to evaluate the outcomes of conservation and restoration actions.

The ISRP commended the GRMW and its cooperators for their M&E Matrix in the 2022 AFHH Review. Their response identified biological and physical M&E efforts for 90 implementation projects in the Grande Ronde/Imnaha subbasins. The summary included information on seven types of biological responses (parr abundance, benthic macroinvertebrates, mussels, redd surveys, pre-spawn mortality, smolt abundance, smolt survival) and seven types of physical responses (habitat condition, water temperature, toxics, flow, riparian condition, groundwater, floodplain condition). It indicated the evaluation design for both project monitoring and basin-scale monitoring. Such information would be a useful addition to the Synthesis Report.

The ISRP's review of the 2018 Synthesis Report noted that the overview of public outreach and discussion of lessons learned were brief and that more information was needed. The 2022 Synthesis Report includes a final discussion section on Lessons Learned and Ongoing Challenges with respect to 1) assessing, identifying, and prioritizing restoration actions, 2) applying adaptive management, and 3) designing and implementing projects. The GRMW clearly identifies the major phases in its development and describes elements of the program that have contributed to its success and aspects that have been challenging. These are useful process-oriented discussions, which will be informative for large restoration programs in the Fish and Wildlife Program.

## **Grande Ronde Model Watershed History**

The ISRP's review of the 2018 Synthesis Report found that it thoroughly summarized the GRMW's institutional evolution and the developmental history of the program. The ISRP's review also noted that the Atlas Process has transitioned GRMW restoration efforts from opportunistic activities into a more strategic process that prioritizes locations and treatments for future work. The ISRP's review advised that the Atlas could be used as a spatial context for evaluating ecological outcomes.

The 2022 Synthesis Report includes a description of the Atlas and its application for prioritizing and designing restoration actions, which is slightly abbreviated from the description of the Atlas Process and Stepwise Process in the 2018 report. A useful addition in the 2022 Report is Table 1, which provides a list of the 31 major types and sources of data in the Atlas. An important item that is not addressed is a discussion of how current prioritization and design techniques have been informed by past work and lessons learned from monitoring the effectiveness of a wide variety of project types, designs, and treatment intensities. A summary of what has

worked well to achieve desired results and what has not would be a useful resource to inform potential adjustments to future prioritization and design approaches.

The ISRP's review of the 2018 Synthesis Report encouraged the GRMW to use the Atlas Process as the spatial context for the evaluating ecological outcomes at a landscape scale. The 2022 Report acknowledges the ISRP's 2018 suggestion but does not address it directly. The 2022 Report describes a future approach for effectiveness monitoring, reach and project monitoring, and watershed-scale evaluation. The reach and project-scale monitoring will use 14 metrics to evaluate the physical and biological outcomes (Table 10). However, these metrics are not identified as data included in the Atlas (Table 1). The ISRP is still unclear whether and how the information in the Atlas will be used to evaluate ecological outcomes at the landscape scale.

The GRMW responded to an ISRP suggestion to modify the Stepwise Process and now reviews project designs at the 15, 30, and 80% stages. In addition, the GRMW proposal for the AFHH Review in 2021 indicated that the project designs will explicitly identify the limiting factors addressed by each new project, the metrics related to each limiting factor that will be evaluated, and the group responsible for measurements. The GRMW proponents have responded positively to the Council's recommendation in this respect. The proponents are developing clear quantitative outcomes, actions, and associated metrics for each subbasin Atlas and Biologically Significant Reaches (BSR) and link the objectives to projects within each BSR to the adaptive management process. Table 3 in the 2022 GRMW Synthesis Report included examples of projects, their status, and biological scoring for the BSRs in the Upper Grande Ronde sub-watershed. Details of the scores for limiting factors in the table would be useful information about how the restoration actions are intended to address specific limiting factors.

## **Restoration Projects**

The 2022 Synthesis Report does not summarize or synthesize information on the extent to which the GRMW's actions have contributed to addressing and improving limiting factors. In fact, no section of the report addresses this aspect of the recommendations of the Council and the ISRP. There is insufficient discussion of key limiting factors and how past experience has helped to better define and understand them. Instead, the 2022 Report describes an approach for future monitoring and evaluation to assist in adaptive management.

The primary request for a summary of evidence for how limiting factors have been addressed by the GRMW remains incomplete. The ISRP's review of the 2018 Synthesis Report found that the Summary and Review of Restoration Actions *"does not provide a synthesis of ecological outcomes from those efforts or the impacts of the program on addressing limiting factors, nor does it indicate how such an analysis is going to be achieved in the future."* The 2022 Synthesis Report addresses the latter portion of the ISRP's concerns and describes a framework for a future analysis. A number of approaches using available information could be used to summarize the GRMW's contributions to addressing limiting factors and provide a synthesis of ecological outcomes. Several have been used in other programs to summarize basin-scale

contributions to habitat restoration to address limiting factors (UCSRB 2014a, 2014b). For example, one approach to summarize cumulative treatments to address various limiting factors could include assessing the proportion of the high priority treatment sites that have been completed to address a specific limiting factor in key watersheds/sub-watersheds. Another would be estimating the proportion of the highest priority miles of stream channel needing treatment that have been completed for a specific limiting factor. Other potential measures could be percent of high priority stream passage blockages successfully treated, percent increase in accessibility to historic habitat for target fish species by treatment of passage barriers, and percent of high priority road segments within 100 feet of stream channels decommissioned or storm-proofed.

The GRMW has access to existing information required to address the Council's recommendation to provide evidence of their collective contributions to addressing limiting factors. They can meet the Council's recommendation by 1) summarizing the extent to which their actions have addressed limiting factors in terms of spatial extent and proportion of the targeted habitat conditions that have been restored and 2) summarizing the major findings in the 78 papers and technical reports specifically related to the Grande Ronde Basin (see Figure 6 in the 2022 Synthesis Report). This task does not require complex analyses or waiting for the future analyses described in the 2022 Synthesis Report. The spatial extent and proportion of the targeted habitat conditions can be calculated from the GRMW's existing data on the past restoration projects and Atlas information on basin habitat. Information on trends in fish populations, ecological performance, and full life cycle responses to major environmental and hydrosystem factors is readily available in 1) the 78 publications, 2) existing analysis of restoration extent and associated metrics (Benge 2016), 3) recent reports on the Upper Grande Ronde and Catherine Creek life cycle models, and 4) the recent AFHH proposal for the Grande Ronde Salmonid Life Cycle Monitoring Project by ODFW. The ISRP's review of the 2018 Synthesis Report highlighted the availability of existing information that could be summarized. It also described the potential to account for past restoration actions in terms of habitat extent and conditions rather than by simply the number of projects. Synthesis of available information would help to show how many of the total priority restoration actions to address limiting factors have been completed. It would also provide useful information about future actions and their strategic locations to measurably improve specific limiting factors. In addition, other syntheses in the Fish and Wildlife Program could provide useful examples, such as the integrated habitat reports of the Upper Columbia River Salmon Recovery Board (UCSRB 2014a, 2014b). The ISRP is available for discussing approaches to summarizing information that would address the Council's recommendation in their decision letter.

The 2022 GRMW Synthesis Report describes a framework for using RME information to create a future synthesis of the GRMW's contributions to addressing limiting factors and potential benefits to fish and wildlife. It provides detailed information on the types of monitoring, locations, time periods, and cooperators by subbasin (Tables 4, 5, 6). It describes a future approach for 1) effectiveness monitoring, 2) reach and project monitoring, and 3) watershed-

scale evaluation. The reach and project-scale monitoring identified key questions to be addressed by metrics and monitoring to evaluate the physical and biological outcomes (Table 10). It would be useful for the GRMW to relate each metric to specific limiting factors identified for the major subbasins.

The 2022 GRMW Synthesis Report also describes an approach to implement an effectiveness monitoring program and provides a case study to demonstrate how the approach could be used to evaluate habitat restoration projects in the basin. The proponents assessed the changes in physical habitat and suitable habitat for juvenile Chinook salmon following the Woodlee project (Figures 7-9, Table 11). They identified key monitoring metrics (Table 10) and estimated that side channels, channel complexity, pools, and habitat suitability had increased by 50% or more after one year. This approach is promising and could inform future activities at the project scale.

Overall, the monitoring described for effectiveness monitoring and reach and project-scale monitoring is based on methods from the Action Effectiveness Monitoring Program (AEM). These methods build on the strength and larger framework of the AEM Program, which is appropriate for monitoring at project or reach scales to measure the effectiveness of specific restoration practices. The GRMW will be faced with some of the same challenges the AEM faces with respect to the comparability of sites, such as biases in site selection (in part created by the inherent prioritization process), adequacy of the number and types of sites available to answer key questions, and continually evolving restoration practices. The ISRP review of the AEM project in the Mainstem and Program Support Category Review discusses these issues in greater detail (see page 48, [ISRP 2019-2](#)).

The section of the 2022 Synthesis Report on “Rolling Up Monitoring Results” relates to the ISRP’s recommendation for assessing outcomes of the GRMW’s restoration efforts at sub-basin or landscape scales in the review of the 2018 Synthesis Report. As stated above, much of this synthesis could be accomplished by summarizing existing publications and documents to report the spatial extent of restoration accomplishments and the proportion of available habitat treated by those actions. The 2022 Synthesis Report describes an approach for measuring key physical metrics that are related to responses by the fish and wildlife populations. The report also identifies two new biological measurements that could be added—changes in parr densities between control and treated reaches and estimates of biological capacity based on measured habitat conditions. Changes in parr density still focus on reach-level observations but can be used to assess representative responses to restoration actions. The ISRP’s review of the AEM Program ([ISRP 2019-2](#)) noted that *“The reach-level focus to measure restoration effectiveness using paired sites in AEM addresses important questions in the Basin, but it also creates limits for extrapolating the findings to entire watersheds, subbasins, or ESUs.”*

The 2022 Synthesis Report indicates that evaluating the status, trends, and recovery of ESA-listed fishes is beyond the scope of the overall GRMW program but identifies the use of life cycle models as possible tools for the analysis of status and trends and the potential benefits of



past and future restoration actions. The ISRP agrees and made the same suggestion in its review of the 2018 Synthesis Report. The ISRP encourages the GRMW to develop a plan to work with partners in the basin to use the existing models to predict the potential effects of completed actions on population parameters and extinction risk. This could include identifying the anticipated biological responses that would be reported, collaborators and their associated responsibilities, potential products, and an approximate timeline.

One of the major areas of progress since the 2018 Synthesis Report has been the development of explicit goals and SMART objectives for each subbasin in which the GRMW conducts restoration work. The GRMW now has SMART objectives for existing projects and requires them for all future projects. The process for prioritization and design of restoration also identifies limiting factors addressed by each project, the metrics related to each limiting factor, and the group responsible for measurements. This addresses the ISRP's earlier concerns about the lack of restoration objectives for projects and subbasins. The GRMW could strengthen these goals and objectives by identifying desired future conditions for subbasins and the broader landscape, a recommendation in the 2018 ISRP review.

### **Improving Effectiveness Monitoring and Adaptive Management Approach**

In 2018, the ISRP commended the GRMW's progress in developing an adaptive management process but was concerned that the report did not discuss the analytical and social (decision-making) requirements needed to support effective adaptive management. The GRMW has made substantial efforts to collaboratively develop an effective adaptive management process with their partners. The 2022 Synthesis Report includes a summary of the adaptive management process, which is described in greater detail in the GRMW's 2021 proposal in the AFHH Review. In addition, the GRMW coauthored a publication in Fisheries that describes the evolution of the collective efforts to restore habitat in the region ([White et al. 2021](#)). The GRMW proposal in 2021 demonstrates progress in developing the analytical and social information and processes required for adaptive management. A particularly good example of the solid foundation that the GRMW has created are the multi-level goals and objectives (see Figure 11) identified for Tier 1 reaches in the Upper Grande Ronde Atlas to assist with the adaptive management process and the overall GRMW program success at multiple scales (Atlas or Watershed, BSR, restoration action). These goals and SMART objectives provide a well-organized and comprehensive approach for formal adaptive management and for continued improvement in the effectiveness of future restoration.

### **Vision for the Future: Research and Restoration, and Synthesis Conclusions**

The GRMW's 2018 Synthesis Report included a final section on their Vision for the Future. The 2022 Synthesis Report does not describe a vision for the future, but it does include a final discussion section on Lessons Learned and Ongoing Challenges with respect to 1) assessing, identifying, and prioritizing restoration actions, 2) adaptive management, and 3) design and

implementation of projects. The Synthesis Report clearly identifies the major phases in its development—goal setting; assessing conditions and identifying restoration opportunities; landowner cooperation; project design, implementation, and evaluation; and ultimately adaptive management. The ISRP commends the GRMW for their progress over decades of restoration efforts.

The Discussion in the 2022 GRMW Synthesis Report is balanced and reflects on the elements of the program that have contributed to its success as well as aspects that have been challenging. Additional details on design and implementation are provided elsewhere in the sections on the Step Process and Atlas Process. However, the description of lessons learned in White et al. (2021) was succinct and more directly focused on biological and physical outcomes. The ISRP encourages the GRMW to continue to provide the combination of concise descriptions as well as more comprehensive discussions of lessons learned and challenges, which are valuable for a wide range of practitioners. These useful process-oriented discussions are informative for other restoration efforts in the Fish and Wildlife Program.

The ISRP feels the GRMW project would benefit substantially by identifying future directions for addressing limiting factors at the subbasin or watershed scale in this document. Strategic subbasin planning built upon 30 years and 900 projects of experience and learning could help identify what remaining work is needed to make meaningful changes to habitat conditions at larger spatial scales. A preliminary draft of broad scale goals and quantitative objectives for achieving future watershed, habitat, and fish conditions could provide essential insights and tangible points for discussions.

## References

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