



Independent Scientific Review Panel

for the Northwest Power & Conservation Council
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Memorandum (ISRP 2012-6A)

April 3, 2012

To: Tony Grover, Division Director, Northwest Power and Conservation Council

From: Rich Alldredge, ISRP Chair

Subject: Comments on the draft Resident Fish and Wildlife Monitoring Strategies

The ISRP was provided the draft resident fish and wildlife monitoring strategies to aid with the review of resident fish, data, and regional coordination proposals. Council staff asked the ISRP to provide feedback on whether the strategies provided useful context for the reviews and to suggest ways to improve the strategies. The ISRP's feedback follows below.

This memo is also attached to the ISRP's Final Review of Proposals for the Resident Fish, Data Management, and Regional Coordination Category (ISRP 2012-6).

Comments on Resident Fish Monitoring Strategy

The Resident Fish Monitoring Strategy (RFMS) provides a useful roadmap for managing population, habitat assessment, and artificial production data. The authors have made a good start at developing an implementation plan for resident fishes in the blocked area by compiling RME approaches for each project (Phase 1). Their approach is consistent with MERR and indicates some regional coordination and cooperation among managers and researchers. Phase 2 (not yet completed) will include "compilation of guidelines for study designs and quality standards" and Phase 3 will entail development of a protocol for data management, sharing, and reporting. The RFMS document asserts that completion of these three Phases will result in a basinwide RME plan for all focal species of resident fish.

The RFMS identifies several impediments to developing a common RME strategy for resident fish that are applicable region-wide. These impediments include the need to manage diverse fish species; differing fisheries management goals, objectives, and interests among regional entities; establishing effective and efficient regional coordination; and the existence of previously established monitoring and evaluation (M&E) programs and protocols. Given these caveats it is difficult to envision the regional M&E plan and how useful it will be. Only some aspects of monitoring, evaluation, and research can be standardized across provinces and subbasins. It is unclear whether it is possible to develop guidelines for such factors as study design, sample size, metrics, and analytic procedures that can be generally applied region-wide and yet be specific enough to be useful for individual projects, or whether the plan will simply

provide general principles that investigators can follow. Resident fish monitoring would benefit from coordination through focused workshops on selected focal species and/or habitats that identify the optimum mix of standard protocols and new methods to move the science and management forward. It may not be possible to address this concern until Phase 2 commences.

With regard to Phase 2, there is continuing debate about what constitutes acceptable levels of data accuracy and precision. Variability can be partitioned into two general categories: observer error and natural environmental variation. The first category refers to departures from a “true” reading caused by imperfect measurement technique or observer error; the second category includes variation caused by temporal changes in conditions over time. The categories are fundamentally different. Reducing observational error may be achieved by improving techniques, sampling more frequently over a short time period, or utilizing multiple observers. Reducing variability caused by natural patchiness in space and time can be achieved by expanding the number of sample sites or sampling over a longer time period. One component of natural environmental variability, when looking at trends over time, is called process error. Process error cannot be reduced and may be the limiting source of variation in long-term monitoring projects. As Phase 2 progresses, it would be useful to develop standards and criteria for these categories of variability.

The RFMS is envisioned to integrate information across multiple spatial scales, monitoring programs, and species. It is unclear what the specific purpose or expected outcome of this integration will be and, given the identified impediments, how it will be accomplished. While the ISRP strongly encourages integration, the purpose must be clear and it must be attainable. One of the purposes is to effectively and efficiently allocate Fish and Wildlife Program resources and to prioritize long-term goals as to desired outcomes.

The resident fish monitoring strategy should focus more on ecosystem monitoring, for which protocols and procedures, and systems models have been developed elsewhere. An ecosystem monitoring program needs to consider the suite of available management decisions then conduct ecosystem simulations to explore the modeled results of these decisions on key response variables, which will guide the monitoring itself (www.ecoissues.ca/index.php/Ecosystem_Monitoring and <http://environment.gov.ab.ca/info/library/7738.pdf>).

RFMS Table 2 includes management questions, high level indicators, program indicators, and potential metrics and is helpful. However, it would benefit from additional development. Definitions and sub-questions are needed for the management questions. The program indicators and potential metrics need to be constructed so they are accurate and easily understood measures of how projects and programs are achieving subbasin and Fish and Wildlife Program goals. For example, the second question – Are Columbia River Basin ecosystems healthy? – has a requirement for a watershed health indicator and should include more than non-native species and focal species population status metrics. The health metric should evaluate the resilience of focal species and include natural and anthropogenic threats to the focal species within some geographic domain.

These threats would include factors outside the boundaries of the Council domain such as mining in Canada for the Flathead system; hybridization with non-natives for bull trout and cutthroat trout; habitat fragmentation and connectivity; and changes in economic development goals. Threats would also include factors within the boundaries of the hydrosystem management such as drawdown, lake level management in a number of the reservoir systems, and changes in water use patterns.

Several issues such as land-use changes, food webs, non-native species, climate change, and socioeconomic values mentioned briefly in the outline deserve additional discussion because they represent factors that have a high potential to influence the status and trends in resident fish populations, but are often undervalued in current monitoring programs.

Below, the ISRP offers feedback on basic questions on the usefulness and coverage of the strategies.

What parts are useful?

All parts are useful in providing context. Specifically, information on the relationship to the MERR plan is important to emphasize. As well, organization of the Fish and Wildlife Program projects by species, province, and subbasin in RFMS Table 1 is helpful. Ideally, this table would also include non-Fish and Wildlife Program projects, too. The information is useful, but it does not yet show how well the projects are linked and coordinated across basins and whether they are collecting information that needs to be collected and if they are effectively and efficiently meeting Fish and Wildlife Program goals.

Do the plans add important contextual information for our review?

Yes, it would have been useful to be aware of outputs from Phase 1 in conducting the reviews of individual proposals. In many cases the sponsors did not make the reader aware that they were in active contact with the other projects. Table 1 provided useful context for the ISRP during the response loop.

Do the plans show that the set of projects are well coordinated, aren't redundant, and are aligned to meet Fish and Wildlife Program goals?

This has not been achieved. Phase 1 has compiled the projects and grouped them by focal species, subbasin, and so forth. The tabular approach used in the spreadsheets shows the projects and what they do, but there is inadequate guiding text elsewhere in the document to clarify how complete and thoroughly linked the activities are. There is no evidence that activities are coordinated, aren't redundant, or are collectively aligned to meet Program goals. Further, it is not clear how this will be achieved. Collecting data at a central location is a start but it does not, in itself, achieve understanding. More thought and planning is needed in this regard.

What parts need expanding?

Table 2 needs additional development as mentioned above. In addition to using non-native species as an HLI in Table 2, it would be worthwhile to show the degree to which habitats have been altered by human activities throughout the basin.

The population metrics should keep natural and hatchery stocks separate when possible, or identify when the metric is based on combined populations. Naturally-produced fishes reflect the condition of the habitat and ecosystem to support them, whereas metrics involving hatchery fish may not fully reflect ecosystem condition.

The ISRP recommends establishing the overall goals, questions, indicators, and metrics before moving on to the Phase 2 study design. It is not clear which portions of resident fish RM&E are watershed specific and require little integration and which portions actually require compatible assessments, although bull trout assessments probably need very clear coordination in order to achieve the goals of recovery plan status assessments. Also, interactions among practitioners of invasive species removal should be beneficial in sharing lessons learned.

What parts could be dropped?

The paragraphs addressing the anadromous aspects could be dropped. They detract from a focus on what is needed for resident fishes.

What are the gaps?

The overall goals need additional clarification. An important gap is the emphasis on fish to the exclusion of other parameters related to the ecological system. More emphasis on measures of riparian and other habitat, food web processes, and diversity, as well as a more comprehensive evaluation of non-natives and land uses would be beneficial. For example, the relation between resident fish substitution and potential effects on native species in ecosystems should be included. Native species also include species other than fish, such as aquatic macroinvertebrates (e.g. native crayfish, *Pacifastacus leniusculus*). In that regard, monitoring metrics should be used to address diversity and ecosystem function as metrics.

Appendix A should include duration of the effort. Appendix B might identify whether the monitoring involves hatchery fish only, natural fish only, or both together because hatchery fish are unmarked. Contact information for the entity storing the information might be included. The provided information is useful, but it does not yet show how well the projects are linked and coordinated across basins, and whether they are all collecting information that needs to be collected.

What are the tangible products of these efforts?

It is not completely clear what the tangible product(s) will be or what the long-term goals are. Will an infrastructure be developed to provide a central server, computer, and staff that will be

responsible for implementing and evaluating the management strategy? Is there an objective to provide higher order analyses? If so, how will it be accomplished?

Comments on Draft Wildlife Monitoring Implementation Strategy (WMIS)

The document is a good step forward. It provides a basinwide context for RME and reporting to help communicate the strategy for implementing the Fish and Wildlife Program and provides context for ISRP review of the Program and its projects. The ISRP provides comments on strengths and weaknesses of the draft WMIS as constructive comments for consideration to improve the process.

The ISRP found the definition and description of the three types of monitoring to be useful for providing context for the discussion. Identification of both specific wildlife objectives that require tracking habitat units (HUs) and standard classification systems for habitat types is a beneficial step. In addition, the ISRP concludes that the list of implementation strategies includes the essential elements and the concepts the wildlife managers considered in developing WMIS are valid and important. Appendix A provides valuable contextual information. Appendix B would be more useful if, in addition to the list of Focal Habitats obtained from the subbasin plans, it also contained an additional column that listed several Focal Wildlife Species of special concern in each, i.e., what species or groups of wildlife species is management in the various focal habitats aimed specifically towards? This species list may also provide guidance toward specific management activities needed in each focal habitat based on species requirements.

In terms of the process, the fact that the Forum had some major areas of agreement indicates that a framework exists to resolve disputes. The fact that the Forum dedicated much effort and was unable to resolve all issues could jeopardize this portion of the Program. A structured decision management framework could help in solidifying these areas of agreement and resolving difficult issues that are still a problem. The discussion of the reporting framework stated that designated projects for each HLI category may be necessary to implement the reporting mechanism. If adequate funding is provided, this framework is a strength. However, if funding is not adequate, this framework is a weakness. Using a central repository to identify protocols is a good strategy as is having a dedicated project acquire data for management, sharing, and reporting.

The ISRP is concerned that Ecosystem Health is not included as an HLI and recommends this indicator be developed and included as soon as possible. Another ISRP concern is the WMIS emphasis on measuring abundance of habitat with an inventory of the entire basin rather than focusing on repeated measures over time to measure trends. The document should focus more on repeatable and economical sampling of the resources, and then on statistical estimation of the abundance of habitat.

The ISRP understands that the Council is responsible for implementation of strategies while co-managers require strategies to support their own decision processes. This situation could potentially create inconsistent strategies, especially because the Council does not expect any of the regional partners to formally adopt the implementation strategies. This is a particularly fruitful area for regional coordination. A related question is not clear, have the metrics, Habitat Units as measured by the Habitat Evaluation Procedures(HEP) process or the Combined Habitat Assessment Protocol (CHAP) method been accepted by all entities in the region? Another potential weakness is that sample designs for obtaining focal species information may vary and yield inconsistent information, if there is no strong pressure to standardize.

It is not clear why the WMIS emphasized the following projects: Upper Columbia Monitoring and Evaluation Project, Ecological Integrity Assessments, Monitoring and Evaluation of Wildlife Areas in Washington; the Kootenai River Floodplain Ecosystem Operational Loss Assessment, Protection, Mitigation, and Rehabilitation Project; and the Habitat and Biodiversity Information System for Columbia River Basin project. More explanation of why these projects are featured would be useful. The level of specificity in the conceptual work plan (Appendix C) may be a weakness if taken to mean that the project sponsors have already been, in effect, identified.

The ISRP has a few suggestions for organizational changes to the document. The description of the distinction between HLIs and FWIs should be presented earlier in the document. Figure 1 provides little value as presented. The figure should be deleted or more information provided to add value. A table should accompany Figure 3 to present differences in habitat changes between the two scenes. These differences could be framed to be valuable to readers if the table provided High-level Indicators. This might be a good figure to also address the scale ideas in Figure 1. Table 1 (p. 27) is useful, so incorporating the most important pieces of Table 1 (p. 15) into Table 1 (p. 27) text is suggested. The Implementation Strategy section could be improved with an introductory paragraph written to identify which major actions, such as Mapping of Landscapes and Ledgers, will follow in this section.

Too much material is repeated in the report. Suggestions for combining sections and deleting others as organizational revisions are: Move/incorporate “Types of Monitoring” (p 8) into current “Completion of Wildlife Monitoring Implementation Strategy”; Incorporate part of “Considerations for Wildlife” (p 13) into “Completion of Wildlife Monitoring Implementation Strategy”; Incorporate Figure 1 section (p 17) into discussion of “mapping” in “Framework: Basinwide strategies”; Move examples, given on page 10, for project effectiveness and action effectiveness monitoring, to later sections. More information should be provided about the methods and analysis being used and evaluated by the projects used as examples on page 11.

Some gaps in content to consider:

- Include acknowledgement that mapping activities may utilize models and these models must be scientifically evaluated rather than automatically accepted as valid.
- For continued development of WMIS, the document must very clearly identify who will do the compilation and reporting and that individual projects must make the data available.

- A description of how information on invasive weeds will fit into the programs described in this document is needed.
- Examples relating maps to HLI's and implementation strategies at the basin scale would be useful.
- The species in the Council's Program concerning Wildlife Mitigation Priorities, Construction and Inundation Loss Assessments should be listed in the WMIS document.
- A list of acronyms and their meaning should be provided as an appendix. The authors should be diligent in defining acronyms the first time they appear.
- A weakness of the document is that the need for so many additional projects is stated it is difficult to keep them straight. A summary identifying and briefly describing the new projects would help, as well as how each project meets Strategy goals.
- It is unclear what constitutes an effective project from a statistical perspective. That is, what are the targets, plus/minus 10%, 25%, or 50% of reference sites? If targets have not been determined, what are thoughts about how to determine targets at this point in the evolution of these plans?
- If a project is effective, there ought to be discussion for actions required for maintaining this effectiveness. What are the plans for making these decisions?