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Review of Draft 2012 MERR and HLI Reports

Review of two documents for the Columbia River Basin Fish and Wildlife Program: (1) March 2012 draft Monitoring, Evaluation, Research, Reporting, and Data Access Framework, and (2) the draft web-based High Level Indicators Report

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Executive Summary

In April 2012, the Council requested that the ISAB review two documents: (1) the March 2012 draft Monitoring, Evaluation, Research, Reporting, and Data Access Framework (draft 2012 MERR) and (2) the draft web-based High Level Indicators (HLI) Report that tracks the progress of regional fish and wildlife efforts in the Columbia River Basin. The documents were developed specifically to address the 2009 Fish and Wildlife Program directive to focus efforts on performance, reporting of results, accountability, and adaptive management. The documents represent more than a decade of effort to develop research, monitoring, and evaluation (RM&E) plans and reports for the Fish and Wildlife Program.

The ISAB finds that the draft 2012 MERR document provides a distinct alternative to previous documents describing RM&E. Unfortunately, the organization of the current draft caused the ISAB some difficulty in conducting a scientific review. The ISAB believes the language in the 2009 Fish and Wildlife Program provides a clearer discussion of the Council's approach to RM&E. For example, the 2009 Program's RM&E section follows the MERR acronym (Monitoring, Evaluation, Research, and Reporting) which provides a logical organizational structure. If the purpose is to create a revised RM&E section in an amended Fish and Wildlife Program, then it may be better to start with the 2009 Program language and use it as the basis for revisions. These revisions should reflect progress and changes from 2009, provide additional clarification on implementation, and incorporate suggestions from the ISAB provided below.

The ISAB finds that the current web-based HLI report is ready to share with the region, preferably after addressing ISAB concerns with consistency of terminology, further qualifying the data, and depicting goals/benchmarks where available. The ISAB believes that HLI reporting can be refined and expanded as feedback on the preliminary set of HLIs is received, additional HLIs are defined, and data gathering and analysis are improved. Further ISAB review of a revised version of the current draft is not needed. However, future HLI reports should better convey progress toward Program goals beyond abundance, such as diversity, productivity, spatial distribution and sustainability. The ISAB would welcome the opportunity to provide advice or feedback on any future expanded HLI reporting.

Past ISAB and ISRP Reviews of Council RM&E Plans and High Level Indicators

The ISAB and ISRP have a long history of reviewing draft Council RM&E plans. These plans made use of general ISAB and ISRP findings and were responsive to specific review criticisms. The reviews are listed and linked below to illustrate the extensive effort and process followed to develop RM&E plans for the Fish and Wildlife Program. In addition to the ISRP and ISAB

reviews, development of these plans included public comment and involvement by fish and wildlife managers.

In 2002, the ISRP reviewed the Council's first comprehensive, standalone Draft Research Plan for Fish and Wildlife in the Columbia River Basin (ISRP 2002-4). In 2005, the Council developed a draft Research Plan that relied on findings from ISAB, ISRP, and ISG reports to identify key uncertainties facing fish and wildlife resource management in the Columbia River Basin. The ISAB and ISRP iteratively reviewed draft plans resulting in significant revisions (ISRP&ISAB 2005-20 and ISRP&ISAB 2005-13). In 2006, the ISAB and ISRP reviewed the Council's Draft Monitoring and Evaluation Guidance Document (ISAB&ISRP 2006-4). The ISAB and ISRP also jointly reviewed the Salmonid Field Protocols Handbook for the Fish and Wildlife Program to further the goal of developing an effective regional monitoring and evaluation plan by establishing standard protocols for collecting salmonid population and habitat data (ISAB 2007-5).

In 2010, the next iteration of the Council RM&E planning effort produced the draft Monitoring, Evaluation, Research and Reporting (MERR) Plan which was designed to provide a monitoring and evaluation framework and improve reporting of Program progress to better inform Council decisions. The ISAB and ISRP reviewed the document (ISAB/ISRP 2010-3) and made recommendations which the Council used to prepare the March 2012 draft that is the subject of this review. According to the Council, this latest version is intended to provide draft policy level guidance to the region to inform the 2013 Program amendments and be a more succinct document than the 2010 version.

In addition, the ISRP and ISAB have reviewed subcomponents of the MERR Plan. The Anadromous Salmonid Monitoring Strategy (ASMS), an implementation guide for the MERR Plan, was jointly reviewed with the ISRP in 2011 (ISRP/ISAB 2011-1). The ISRP referred to the ASMS during its Categorical Review of Research, Monitoring and Evaluation and Artificial Production projects. The ISRP reviewed the related strategies for resident fish and wildlife monitoring as part of the Resident Fish, Data Management, and Regional Coordination Category Review (ISRP 2012-6A).

Another component of the MERR document is a list of High Level Indicators. In 2009, the Council created an initial list of HLIs, which the ISAB and ISRP reviewed and made suggestions for improvement (ISAB 2009-2). After revisions were complete, the ISAB reviewed the updated HLIs, providing comments on the graphics and data (ISAB 2010-6) and producing a memo specifically on HLIs for monitoring diversity (ISAB 2012-2). As described in Council documents, the web-based HLI report that is the subject of this review is intended to be a starting point to show readers what data are available and which key metrics the Council intends to report. The Council intends that future refinements should benefit from improved data availability as the region better understands the Council's data needs.

In this current review report, the ISAB provides comments on the March 2012 draft MERR and HLI documents with the benefit of past reviews and understanding the Council's intent for future iterations. This review is in two parts. First, the ISAB provides comments on the draft

MERR document. Second, the ISAB comments on the draft HLI report and answers the specific questions posed by the Council on HLIs in their April 18, 2012 memo.

ISAB Comments on the draft MERR and Data Access Framework

The March 2012 Draft Monitoring, Evaluation, Research, Reporting, and Data Access Framework is available online at www.nwcouncil.org/fw/merr/Default.asp.

General Comments

The overall content of the draft Framework is good, but several aspects of the draft would benefit from clarification and reorganization. The ISAB recognizes there are many ways to organize this information and offers the following suggestions. The document should begin with introductory material and schematics, such as those used to explain the overall process and relationships among the elements in the previous MERR draft. An introductory section that provides background on the need and intent of the document would lay a foundation for understanding its purpose. The ISAB suggests following the organization in the 2009 Fish and Wildlife Program so that Guiding Principles come before Specific Strategies. This approach would outline the overall rationale for the task-oriented strategies and actions that follow, allowing specific strategies to follow naturally from guiding principles

The new, more concise format for the Framework is a substantial departure from the last draft. Although conciseness is often more efficient and effective, this draft may have become too focused and brief to be effective. Nevertheless, the document does convey the message that the Council is requesting more organized and consistent data collection and monitoring to assist in its decision making.

There appear to be several intended audiences, including the Council, BPA staff, managers, project sponsors, and the public. Therefore, MERR information needs to be presented at several different levels. For the Council the current version may be too detailed so that a two-page executive summary with some diagrams might be sufficient. To provide guidance on monitoring, evaluation, research, reporting and data access, this version falls short in providing clear guidance on why, what, when, and how the items summarized in the report should occur. Not enough detail is provided for data providers and coordinators to implement the reporting and data access strategies. However, a separate holistic document may not be necessary if the details can be described in supporting documents accessible through live web-links. This approach would be consistent with the species specific monitoring strategies developed in the current MERR approach. The linked components would be the working, evolving documents.

In the current draft the use of specific strategies and guiding principles are often not stated directly, and therefore are not clearly understood. Definition of what is meant by strategies and guiding principles would be helpful. Some of the guiding principles seem to be objectives or

intents while others seem to be tasks. Also, because the overall purpose of the document is not included, the connection of the strategies to their intended outcomes is unclear.

Time frames are missing from the framework. Without some stipulation of when reporting or evaluation should occur, it might be difficult to use this framework. Throughout the document, there is mention of the appropriateness of scale, which often refers to spatial scale, but occasionally perhaps to organismal or jurisdictional scale. The term “appropriate scale” should be defined and its meaning clarified early in the document.

Comments on Sections

A. Primary Strategies
The material in this section is not clearly presented. The section should be revised to state the strategies directly and to minimize excess words that detract from the important points (e.g., appropriate, efficient, and critical). As written, it is not clear what the primary strategies are. Based on this section strategies could be stated as:

- first focus on habitat as a primary driving factor
- then focus on artificial production and its interaction with habitat
- provide timely evaluation and reporting of information to support adaptive management
- focus on the scales that are most appropriate for answering critical questions

B. Evaluation, Reporting and Data Access
The organization of this section is confusing. The introductory paragraph seems to fit better in Section A. In each section, the guiding principles should precede the specific strategies. The principles should be stated more directly as statements of fact or common understanding of what makes an evaluation effective.

This section does not provide effective guidance because it lacks clarity. The evaluation section is weak because it does not explain what is to be evaluated, when it should be evaluated, and how it should be done. If evaluation is to be done for all monitoring and research, this section seems misplaced as it would be clearer to define what needs to be evaluated after explaining other activities. The section stipulates that monitoring and research should outline details for evaluation, but gives very little guidance on carrying out evaluations, who will receive the results of the evaluations, and what will be done with the results.

Hedge words like “when feasible” and “as feasible” should be dropped in favor of clear statements of what is needed to do this well. All work done carries these caveats.

There are several issues affecting the clarity of this section. The strategy and principles seem to be confused in the Reporting Subsection. The principles include four types of reports that do

not follow from or reflect the principles, but rather seem to be part of the strategy or tactics needed to implement the broader strategy. Also, the notions of synthesis and scale are unclear. Synthesis implies the development of something new while scale is a complex notion with many implications. More care is needed in developing these terms as part of the principles and specific strategies. The principles and strategies should be clearly linked, perhaps by asking questions such as, why we need to do this and what are we going to do?

Under Reporting Principles, the four types of reports also include some more specific types of reports that are shown in italics, and at times with a key word in parentheses. The structure seems inconsistent among the four types, and it is not clear whether these are examples or the only types of reports expected. Perhaps a simpler outline structure or schematic with some direct statements describing each type of report, how they link together, who prepares them, and when they are to be prepared would help.

Under Data Access, the guiding principles and strategies again seem to be confused. A key principle would seem to be: a consistent format and methodology facilitates data sharing and synthesis. The strategy would outline the steps in getting there. This section also suffers from long descriptions of points that could be described more succinctly. People trained in data management should be able to find and use the appropriate protocols.

C. Monitoring and Research

The same organizational issues cited above are relevant for this section, including confusion between guiding principles and strategies. Also, to be consistent with the MERR name (Monitoring, Evaluation, Research, and Reporting) one would expect monitoring to appear before evaluation and reporting.

The risk uncertainty matrix is a useful concept for prioritizing research and monitoring, but more development may be necessary to guide going from the concept to implementation. Conceptually the risk/uncertainty framework itself introduces uncertainty as the methodology requires professional judgment to place proposed work in a particular quadrant, which will be difficult when data are lacking or when a new issue arises, such as the appearance of a new invasive species whose threat level is unknown.

Some sections are too wordy. Guidance would be more effective if it was given as succinctly as possible. Some points are common among several sections and could be described only once. An example would be the statement that sometimes the work is done by the team of biologists responsible, whereas other times a third party is hired. Some points need headings for emphasis. For example, identifying control or reference sites is critical for monitoring and should be highlighted.

The sentence in Research *i) Specific strategy: "*The Program prioritizes research of topics or the development of innovative tools where, within a reasonable amount of time and at a reasonable cost, results will likely better inform decisions." should be clarified. Is the point that the Program places a high priority on cost-effective research that will develop information or

tools that result in better decisions about fish and wildlife management? If so, the first paragraph under *ii) Guiding principles* seems to state nearly the same point and thus is redundant.

D. Overarching Guidance
It is not clear why this section is called guidance because it seems to be introductory material concerning implementation of the MERR plan. This section of the document could be placed in the introduction to provide a detailed implementation plan with specifics on data types to be provided and time schedules for providing data.

ISAB Comments on the draft HLI Web-based Report and Supporting Documents

General Comments

To provide general comments and answer the questions below, the ISAB explored the web-based HLI report, referred to documents linked to that report, and read the Council staff's April 17, 2012 memo to the Council's Fish and Wildlife Committee "Staff overview of Council's HLI Report effort" that was attached to the Council's review request memo to the ISAB. The ISAB notes that the Council's questions to the ISAB focus as much on whether it is clear what the draft HLI report does not cover as much as what it does cover. The Council's questions 1 - 5 are addressed in the first 2 pages of the April 17 memo but to a much lesser degree in the web-based report.

The approach of using a web-based report with downloadable data to answer basic questions about returning salmon and steelhead is good. Likewise being able use web-links to explore the data more fully, such as the survival of outmigrating smolts or returning adults, is useful. It is also very useful that these graphs are presented with simple statements and clear graphics, linked to the actual data.

The report provides summaries of substantial information and a number of different metrics, but the utility would be increased substantially with appropriate benchmarks and synthesis statements to allow the audience to understand their significance. Understandably, the HLI are most useful if the take home message is obvious, but with these data that is not always the case. For example, increasing abundance looks good, but does not necessarily answer the full range of questions implied by the Program's goals. Given the limitations noted for some data and lack of clear goals or other context for some metrics, the report would benefit from additional discussion. What can someone without a strong background in the Basin or in restoration conclude from this summary? Are the overall trends very strong, consistent and encouraging, or are they mixed and uncertain? Are goals nearly met or quite distant? What are the goals beyond 5 million returning fish? It appears that 1a provides solid information allowing an interpretation of a trend and a clear goal. Others that might provide similar information are

1d, 1e, 1f, 2a, 2b, and 2c if some context or goal could be developed. For example, sustainability of natural fish populations is an obvious goal, and this can be assessed by plotting over time the number of adults returning from parent spawners (R/S) in a watershed. R/S must be greater than 1 on average to sustain a population and much greater than 1 to support harvest. R/S data for natural populations are available for some natural populations in the Snake River Basin. Given the uncertainty of some metrics without goals or context, it might be useful to present fewer metrics and state that more work is needed to develop metrics that will convey additional information.

In some cases critical details are missing. For example, on the graph of reach survival for adult salmon and steelhead (hydrosystem survival and passage), the reach over which the survival was calculated between the two specific dams was not given. The ISAB suggests that a greater emphasis be given to progress at the subbasin level and to inclusion of estuary and ocean indicators. These additions would help show how progress at the subbasin level has contributed to progress at the regional level, and how estuary and ocean effects are related to Columbia River Basin actions and responses. For example, an ocean condition indicator could indicate the degree to which ocean conditions has contributed to trends in abundance shown in some HLI graphs.

Answers to the Council's Questions

1. *Does the web-based report properly describe why HLIs are adopted by the Council?*

The memo (Appendix 2) clearly describes the rationale for adoption of HLIs, but the web-based report does not. It would be beneficial if the background section provided a link to download the Council's Fish and Wildlife Program document.

2. *Are HLIs and supporting FW Indicators presented in a manner that effectively conveys that these are a subset of indicators that the Council is developing to properly report on the Council's Program and the status of the Columbia River Basin's fish, wildlife and habitat?*

Yes, but the suggestion that "all of the indicators for Council Actions are related to habitat work" might be misleading. The indicators reflect conditions (e.g., the abundance of Chinook salmon at dams) that may respond to habitat, but are also strongly influenced by many other factors. This statement should be refined to convey the complexity of the issues that must be considered.

The focus here has been largely on abundance because that is the information that is most available. Understanding the dimensions of diversity, spatial distribution, productivity and sustainability are essential, but will be more challenging because they require additional effort to generate or retrieve the metric or data and the path forward is not as clear. The explanations

should report that these other components need to be considered, even if metrics have not been selected. Given that, the presentation is also a bit confusing with the use of "abundance" which heads the list, but then switches to the broader question of whether the Columbia River Basin species are abundant, diverse, productive, spatially distributed, and sustainable with each metric. It would be useful to use a common terminology throughout the report. Given that virtually all information addresses abundance, but not the other questions, it might serve to highlight the need for broader measures by introducing the broad questions, but limiting the summary figures to the narrower one actually addressed.

3. *Does the report effectively convey that the biological HLIs serve to describe the larger context within which the Council's Program aims to mitigate, restore, and enhance fish and wildlife impacted by the hydrosystem?*

Not completely. The report focuses primarily on the goal of increased abundance of salmon returns to the Columbia River at the regional level, so it does not effectively convey the larger context. The other elements of the goal will require more development in the future, as will the importance of HLIs for wild fish and fish protected under the Endangered Species Act. Given that the Council's program attempts to enhance salmon sustainability through habitat actions and that natural salmon are more dependent on rearing and spawning habitat than hatchery salmon, the HLIs should provide some context for natural versus hatchery salmon. For example, Fig. 1a shows the combined abundance of hatchery and natural salmon. Estimates of hatchery versus natural production are not yet available for the entire Basin, although the Columbia Basin Fish and Wildlife Authority is attempting to make estimates for the past several years.

4. *Does the report effectively convey that the Council Actions HLIs serve to track what work was performed under the Program and not necessarily reflect all work done within the Basin by other entities?*

This point is not entirely clear because it is not clearly stated on the HLI Background page. Also it is not clear that HLIs can be interpreted as a performance measure for any single entity.

5. *Do the HLIs and supporting FW Indicators adequately and appropriately acknowledge existing objectives established by the Council or other entities? Can you suggest appropriate means to convey objectives from other entities, such as NOAA Fisheries' survival targets for ESA-listed fish populations?*

It is encouraging to learn that other HLIs, such as the red-yellow-green indicators of ocean status (see ISRP 2012-3) and non-native species in subbasins, are under consideration by the Council.

It may be a good idea to develop a general figure showing how the Council's program fits into the larger comprehensive strategy. Who is responsible for what? How do Council actions interface with those from EPA, USGS, and others?

The Lower Snake River Basin Compensation Program has goals for harvest, abundance, and survival of salmonids. Agencies have been tracking these metrics for a number of watersheds and species in the Snake River Basin. Please see NMFS recovery plans and recent ISRP reviews of the Lower Snake River Basin Compensation Program (ISRP 2011-14).

6. *Are the data used for informing the HLIs and their supporting FW indicators appropriate?*

The data seem appropriate for the metrics that are identified. Some metrics are not as useful as they might be because they do not have appropriate context and some important limitations are not clearly stated. For example, indications of uncertainty or variability in the data are not included. Limitations associated with the data need to be described as users cannot be expected to do this evaluation themselves. Clear identification of the criteria for evaluating whether the data are appropriate should be provided.

7. *Are the data adequately supported by the more detailed information provided by the "table and citations link," and is this supporting information easily accessible?*

Yes, this is a very nice feature. As always, there may be some room for improvement. Generally the supporting information is useful and accessible, but in some cases it simply lists citations or other data sources (e.g., 1a and 1e have very different levels of detail and disclaimer). The level of detail provided in 1a (both the statement of the goal and the supporting citation) would be appropriate throughout. The general discussion could be more useful if it was consistent among metrics and explained why the data are considered useful for the purpose of an HLI and how they might relate to the overarching questions. The terms "naturally produced" and "wild" are both used with some metrics without clarifying if they are intended to mean the same thing. In the case of the wild smolt SARs, the apparent goal is shown but is not described in the text or heading. In the case of sockeye harvest rates, the goal seems to vary through time. The citation should include more information about the goals, rather than just referencing the Council report.

8. *Does the report appropriately convey the limitation of the data used, given that for some HLIs and supporting FW Indicators the available data may not be the best we could want for the HLI Report?*

More attention should be given to the limitations of the data. Perhaps a short section labeled "Limitations of the data" could be included, after the main synthesis of the meaning of the data is presented. Also consider adding a note such as the one appearing on the background page to data pages because people might skip to the data pages and not read the background info, or perhaps provide a link on each page that mentions limitations.

As currently described there is no mention of the role of ocean survival as an influence on full life-cycle survival. Ocean survival is a caveat on relationships between freshwater habitat restoration efforts in relation to any improvements in survival or abundance.

In addition to vital protection of streams and riparian areas, there are several other Council-level actions that are important as HLI development continues. For example, how many cooperative agreements for habitat protection and control of non-native species have been entered into with subbasins or counties? What type of agreements, and how many, have been negotiated for the control of agricultural pesticides and wastewater treatment effluents? Issues of similar overall importance should be considered as HLI development continues.

9. *Are the graphics easy to comprehend for non-scientists? Does the ISAB have any suggestions for improvements?*

The graphics are high quality and generally understandable. However, many of the metrics have no goal or other measure that can provide context to aid understanding the success of the program. For example, the miles of habitat improved means little without some understanding of how much is needed to achieve the desired effect (e.g., increasing salmon abundance, production, or spatial distribution). These are admittedly difficult measures to provide at this point, but without them the measures may not be particularly useful. It might be useful discuss whether those will be developed for all metrics in the future.

The graphs would be more useful if they were accompanied by more detailed text that interprets the trends. The HLI report would be improved if it provided both supporting and alternative explanations for the trends in the charts. For example, the report could address the observation that the trends in adult returns might be more closely related to trends in climate and ocean conditions than to performance of the Program (freshwater habitat improvements). Use of green and red in some of the charts with multiple data series might be avoided or used with stippling or symbols to aid those who have difficulties distinguishing colors. Some chart titles need to be updated to 2010, or later.

10. *Regarding the comprehensive list of HLIs that the Council identified as those meriting development, are there any HLI topics that have been omitted that should be included, or that should be a priority for a follow-up effort?*

For this question, the ISAB referred to the set of indicators provided at www.nwcouncil.org/fw/program/hli/indicators2.asp. This link is available through the HLI web-based report under Background.

Recently, the ISAB commented to the Council on the need to consider more than abundance in HLIs and the general emphasis of the Program (ISAB 2011-4 and ISAB 2012-2). The ISAB provided suggestions about rebalancing the vision, goals, and monitoring efforts to consider the notion of diversity more fully. Given the impending changes in climate and the fact that many fish can rebound quickly from relatively low abundance given their high fecundity (among vertebrates), more emphasis should be placed on other goals such as diversity of life history and spatial distribution. These may be much more important for buffering the impending increased variability in climate and stream flow.

As summarized in our general comments above, for a measure of sustainability and life cycle productivity, a time series of adult returns per parent spawner (R/S) could be presented for a number of natural salmon populations. R/S values below 1 indicate the population is not sustainable. Values must be considerably above 1 in order to support productive harvests. Some R/S data exist for the Snake River basin and for Hanford Reach Chinook salmon.

In addition, the HLI "Coordination of Council Fish and Wildlife Program with other fish and wildlife entities, activities, and programs in the basin" should be developed. Given the recent concerns and information raised in the ISAB's Food Web Report (ISAB 2011-1) and the Landscape Report (ISAB 2011-4) it would be useful to begin careful evaluation of alternatives for developing HLIs addressing issues such as pesticides and other chemicals, changes in land use in the Basin, trends in water temperatures and turbidity, dates on which outgoing and incoming anadromous fish enter the estuary and other estuary indicators, integrative measures of food production for juvenile salmonids, the distribution and number of hybrid food webs, and human population density or urbanization.

A precise timeline date for first reporting of each approved HLI would be helpful. Since the Program plan is structured by subbasin, the HLI list might better reflect that spatial structure. Dam counts should be allocated to hatchery versus wild fish. Additional biological indicators for wild fish are needed (body size/age of adult returns, sex composition of spawners) and productivity (recruits per spawner, variation in R/S). Although ecosystem health indicators have not been approved, it is important to develop such indicators to include toxic contaminants/pollution and habitat conditions in the tributaries and on the spawning grounds (e.g., temperature, flow). Is bycatch in non-target marine groundfish fisheries (U.S. West Coast, Gulf of Alaska, Bering Sea) to be included in the "Contribution of Council's Fish and Wildlife program funded hatcheries to Columbia River Basin and ocean fisheries" indicator?

11. Is there a better way to portray the data in the HLI Report, and if so, how?

Statements about trends should be clarified by noting whether the trends are statistically significant or simply suggestive of trends. In Figure 1a, the statement concludes that salmonid counts at Bonneville Dam have increased over time, but this statement does not reflect the majority of the time series from 1938-1999 when there was little or no trend over time. The ISAB supports the use of creative graphical displays in conjunction with appropriate interpretations to aid in conveying complex information associated with Columbia River Basin data.

Can the web-link used on 1a to portray the other options of abundance of fish and wildlife be made available on the other pages too (i.e., 1b-1h, 2b-2c, 3b-3g)? These graphics are useful for presenting issues in the Basin to a non-scientific audience.

For the estuary, it may be appropriate to use area (e.g., square miles) of habitat restored, in addition to a linear measure such as miles of dikes breached.