DRAFT

Research, Monitoring and Evaluation – Lower Snake River tributaries
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Local and regional efforts have begun to achieve a coordinated approach in the Columbia River subbasins to recover ESA listed salmon and steelhead. A part of those efforts is the development of Research, Monitoring and Evaluation (RME) plans that will help direct limited funds to accomplishing the most critical work.

Within the Lower Snake River subbasin, the subbasin planning process has been the first step toward a coordinated multi-agency effort to develop a comprehensive RM&E plan for the small tributaries in the Lower Snake Subbasin. The plan will pull from regional RME efforts such as the FCRPS Biop plan being developed under the direction of NOAA, the Washington Comprehensive Monitoring Strategy for Watershed Health and Salmon Recovery (CMS), and other similar strategies and plans currently under development.

The RME plan that follows is an attempt to identify priorities in concepts for implementation in the next three to six years. While it would be desirable to have a completed comprehensive RME plan now, the time allowed for its development under the subbasin planning effort is inadequate. This plan will therefore, serve as an interim set of guidelines that will assure a systematic approach to directing and funding RME will occur. Further, this interim plan will serve to facilitate coordination of RME in the tributary portions of the Lower Snake River subbasin among management entities, and to help dovetail subbasin basin actions within the broader Columbia Basin RME effort.

Guiding Principles and Priorities

- Fill EDT data gaps and establish baseline habitat conditions
  - Verify attribute values to validate EDT modeling runs
  - Establish firm baseline of habitat conditions to track change over time or response to habitat improvement actions undertaken in the basin (effectiveness monitoring)
- Focus RME efforts on critical data needs for VSP attributes.
- Implementation and effectiveness monitoring to document actions should be funded/undertaken within the basin (Implementation - how much, how many sites, how often, where: Effectiveness – habitat and localized fish response)
- Critical uncertainties? (Causal relationships among actions and population response, and confounding factors that may affect our understanding of those relationships).
- Coordinate with regional efforts (Tier 3 studies)
- Data management and coordination are crucial to meet regional data accessibility needs.
- Methodologies should provide data of known quality (accuracy and precision)

- Validate EDT model as a reliable measure of habitat and population response to recovery actions taken in the Lower Snake Subbasin tributaries (including Deadman and Almota creeks, and possibly in Alpowa Creek).
- A systematic approach to project selection and funding will be used that is consistent with and complementary to other RME efforts within the Columbia Basin

Fill EDT data gaps and establish baseline habitat conditions

The EDT model was populated with limited empirical data for the Lower Snake River subbasin tributaries. In all cases empirical data were used if available. However many habitat attributes were rated based on cusory knowledge and best professional judgment. It is clear that such data may inadequately represent habitat and fish assemblage conditions. The predictive capacity of EDT to help direct recovery actions and assess their potential beneficial effect could be substantially limited by the data quality. Improving data quality by collecting empirical data should be a priority if the following conditions are met:

- Those attributes with the greatest leverage on EDT model outputs (e.g. max width, gradient, habitat type inventories, large wood, bed scour) (From: *Mobrand Biometrics Quick Guide to Developing the Stream Reach Editor*, 2003)
- Those that are within priority protection or restoration stream reaches of Almota, Deadman, Alpowa and Penawawa creeks.
- Data is limited for attributes that have a broad (subbasin wide) effect on population or habitat status (passage at obstructions, water quality, others?)
- Identified in the Hypotheses and Objectives within the subbasin plan
- Additional baseline data are needed for EDT in reaches with little or no empirical data or local knowledge in Deadman and Almota creeks.

Focus RM&E efforts on critical data needs for VSP attributes.

Four critical areas were identified under NOAA's Viable Salmonid Population (VSP) treatise. Presently an evaluation and rating system for populations within ESUs is being developed by the Interior Columbia TRT. Once the methodology is complete, completing a rating exercise for the basin will be necessary. Beyond that action, specific needs have been identified for each of the four areas of VSP:

Abundance

Adult: (This can be greatly impacted by out-of-subbasin-effects but is critical to monitoring population status.)
Run size to the basin
Escapement - includes hatchery interactions in natural spawning areas.
Harvest – In-basin hatchery harvest and incidental hooking mortality of wild fish. Out-of-basin harvest and mortality

Juvenile - smolt production at the subpopulation level to reflect freshwater survival and production within the basin. It will be critical in modeling population response to habitat restoration actions.

Diversity: Genetic characterization, life history pathways (juvenile and adult), artificial propagation effects (hatcheries)

Spatial Structure Distribution of juveniles and adults within the subbasin, habitat limiting factors.

Productivity Population Growth rate or potential – juvenile and natural return ratio (NRR) for adults (should be above replacement or 1.0). Hatchery effects should not reduce NRR below 1.0

Implementation and Effectiveness monitoring

Documenting the why, where, how much and whether of habitat recovery actions completed in the basin. (Adopt the SRFB Effectiveness Monitoring Statistical Design criteria (see *SRFB Monitoring and Evaluation Strategy for Habitat Restoration and Acquisition Projects*.)

Critical uncertainties

Numerous efforts are presently ongoing within the Columbia Basin to recover ESA listed salmonid. Research is underway to document population response to habitat, hatchery, harvest and hydro modifications. During these actions the general understanding of the biology and ecology of salmon and steelhead populations is increasing. There remain significant data gaps and critical uncertainties regarding recovery actions. Limited funds must be used wisely to help ensure ESA populations receive maximum benefit from actions. Many critical uncertainties remain throughout the region, and within the subbasin. These uncertainties must be answered if populations are to be rebuilt and delisted. Such uncertainties may include habitat/life history stage relationships, causal relationships for degraded habitat and depressed or extirpated populations, and understanding the relationship between resident and anadromous O. mykiss subpopulations. These critical uncertainties will be identified in forums such as: Regional salmon recovery planning; Region wide (Columbia Basin) critical needs lists developed by management agencies; NOAA's Comprehensive FCRPS BiOp RME plan; and Washington State's Comprehensive Monitoring Strategy; and the Lower Snake River Subbasin Comprehensive RME Plan.

Conclusions and Recommendations

The Lower Snake subbasin managers and stakeholders have implemented efforts to coordinate recovery and RME actions within the subbasin. However, until recently little

documentation existed regarding salmonid presence, distribution, abundance or habitat conditions for the small tributaries of the lower Snake River. Available documentation is still rather cursory (Mendel 1981, Mendel and Taylor 1982, Mendel 1999, and Mendel 2004, Subbasin Summary 2001). Additional information is necessary to evaluate stock status and habitat conditions in these tributaries. The managers attempted to identify the current level of effort, and a subjective assessment of those effort's progress toward meeting data needs within the subbasin. A complete prioritization of actions needed has not been accomplished. Following are broad conclusions and recommendations based on guiding principles and priorities. These will serve as generalized high priority (in principle) actions that should be pursued while the more comprehensive RME plan is completed.

1. *Conclusion:* The quality of data used within the EDT attributes and modeling exercise is inadequate. Empirical data of know accuracy and precision is needed for priority areas (habitat inventory using standardized protocols from region that will fit EDT) of the subbasin (see section ???). These data will be used to evaluate the efficacy of EDT in modeling habitat and population response to actions taken within the subbasin, and to evaluate the hypotheses and objectives presented in the subbasin plan.

Recommendation: Fund and implement habitat inventories within the next 3 years to collect data necessary to fill data gaps for attributes with high EDT model leverage and evaluation of progress toward meeting subbasin plan objectives for Almota and Deadman creeks.

Recommendation: Fund and implement habitat inventories to collect data necessary to populate the EDT model for Alpowa Creek within the next 3 years. This stream has high potential for restoration and additional information would be very helpful for guiding restoration actions and modeling or monitoring the potential effects of restoration efforts.

2. *Conclusion:* Population status monitoring must occur in a systematic manner that will allow managers to evaluate their progress toward delisting from ESA. Criteria established by NOAA and the TRTs under VSP will be used within the subbasin. These metrics will be useful within EDT, and provide a direct relationship between the habitat and population monitoring efforts, through model outputs.

Recommendation: Fund and implement periodic (1-2 years of data collection at 3-5 year intervals) monitoring and evaluation actions within the subbasin that allows population status monitoring and provides some of the critical VSP data needs. This entails low intensity sampling to estimate adult abundance based on redd surveys (or passive enumeration) and periodic assessment of juvenile abundance and distribution. Tissue samples should be collected and genetic characterization should be completed to help identify which steelhead population inhabits these tributaries of the Lower Snake Subbasin..

3. *Conclusion*: Basic monitoring of restoration actions undertaken within the subbasin needs to occur to ensure that they were completed in accordance with

expectations (Implementation monitoring). However, the effects of those actions on the habitat and salmonid populations (Effectiveness monitoring) is costly and should be done on only a portion of completed projects.
Recommendation: Accountability for restoration actions needs to occur for each project. Basic documentation should be completed in a cost efficient manner. A systematic approach to documenting effectiveness is required that provides sufficient accountability without unnecessary redundancy or expense. (e.g. classes of actions my be represented by monitoring a small portion of similar projects)

4. *Conclusion:* Critical uncertainties will be identified in the Comprehensive RME plan and coordinated with other regional forums. Uncertainties must be understood and answered if population recovery is to occur. ESU wide uncertainties may be addressed in the subbain as part of a regional RME effort. Subbasin specific factors may need localized RME efforts to answer.

Recommendation: Fund research on critical uncertainties represented in the Lower Snake with a broader ESU relevance if not being funded or conducted in other subbasins, or if it is a high priority or it is unique to this subbasin . (coordinated regional efforts)