`Willamette Action Team for Ecosystem Restoration (WATER)
Research, Monitoring and Evaluation (RM&E)
April 26, 2018 Meeting

http://www.nwd-wc.usace.army.mil/tmt/documents/FPOM/2010/Willamette_Coordination/Willamette%20RME/RME.html

Facilitator's Summary

ACTION	**BY WHOM?**	BY WHEN?
Pending Items from January 25, 2018 Meeting		
Update Middle Fork RM&E Study Schedule to reflect the current status as Version 2; send the updated plan to the team.	Rich	After options for Lookout Point are clarified
Action Items from April 26, 2018 Meeting		
Provide proposal on copepods issue to RM&E Team for review.	Rachel	May 24, 2018 RM&E Team meeting
Coordinate a meeting with NMFS and ODFW to discuss streamlining of permitting process for RM&E studies and report meeting results to RM&E team.	Fenton, Anne and Kelly	May 24, 2018 RM&E Team meeting
Prepare a concept paper that delineates specific ResSim modeling runs related to potential delayed refill and spring/fall spill operations.	Rich	May 24, 2018 RM&E Team meeting
Prepare FY19 concept papers related to North Santiam actions/issues for RM&E Team review.	Rich, Diana and Dave	May 24, 2018 RM&E Team meeting
Check with Detroit PDT regarding information needs for Downstream passage design – forebay guidance to FSS	Rich	May 24, 2018 RM&E Team meeting
Present summary of information on TDG and Chinook habitat availability below Big Cliff and Minto dams	Ricardo	May 24, 2018 RM&E Team meeting
Revise the draft North Santiam FY19 RM&E Planning Table.	Rich	**[*Completed 4/26/18]***
Submit comments on reports.	All	ASAP

Participants in the Room: Leslie Bach (NPCC), Cindy Bowline (USACE), Diana Dishman (NMFS), Mike Hudson (USFW), Rachel Neuenhoff (USACE), Christine Peterson (BPA), Rich Piaskowski (USACE), Kelly Reis (ODFW), Dan Spear (BPA), Ricardo Walker (USACE);

Participants on the Phone: James Hughes (PNNL), Dave Jepsen (ODFW), Fenton Kahn (USACE), Anne Mullan (NOAA), Todd Pierce (USACE), Greg Taylor (USACE), Lawrence Schwabe (CTGR).

Facilitation Team: Nancy Pionk and Colby Mills (DS Consulting).

Welcome, Housekeeping and Updates
Nancy welcomed the group and conducted a round of introductions. There were no summaries for approval. Team members provided the following updates:

- **Middle Fork RM&E Plan Study Schedule:** Rich noted that he is making progress with updating the schedule and intends to incorporate information from the discussion on Lookout Point operations into the study schedule update.
- **Lookout Point Spring Spill Test**: Fenton reported that the spill test could not go forward because Lookout Point Reservoir did not fill enough to reach the spillway. PNNL released the fish as proposed by Fenton in his March 27, 2018 email to the team so that their behavior and passage can still be evaluated under the normal reservoir operations that occur this spring.
- **RM&E Sub-basin Plans**: Rich reported that the team has made good progress. He expects that the North Santiam 50% draft should be available within a few weeks for the RM&E team to review.
- **Reintroduction Plan**: Kelly has been communicating with Rich regarding the plan. No specific update at this time.
- **PFFC/Copepods Concept Paper**: Rachel Neuenhoff recently joined the Corps as a biologist (previously she worked at USFWS). She is focusing on the copepod issue and is refining the initial draft concept prepared in February regarding copepods and working with the OSU researchers to refine a research proposal. Rich emailed the revised concept paper and OSU proposal to address the concept to the RM&E Team for review on 4/27/18.

  She noted that the proposal concept includes: 1) the impact of handling stress when there is high copepod infection intensity and prevalence; 2) an ecological model to better predict the number of copepod infected vs. non-infected fish; 3) consideration of the potential for out-planted adults possibly seeding areas above the dams with copepods; and 4) structured decision-making among stakeholders for management actions. There is also a strong interest from the lab to work with eDNA; however, she noted relating this to how copepods are distributed in reservoirs and streams is challenging. Diana and Mike shared the same concerns.

  RM&E team members raised concerns that the proposal may become broader than what had been initially discussed by the team. There was interest in narrowing the questions that will be researched, in light of limited funding resources. Those questions include: what is the impact of copepod infection in Cougar reservoir, what can be done about it, and what are viable options for treatment and decision-making regarding treatment or other management options. Additionally, there was interest in learning more about holding and handling stress. It was also noted that a key conclusion from the Science Review was that the load of infection may not be as important as the location of the infection to mortality and handling stress, given the poor survival of fish with gill damage in contrast to lower mortality of fish with fin insertion infection.

  Rich noted that the funding for the research is uncertain as the Corps is still working under a continuing resolution. The intent is to begin the research in 2018 if funded. Rich and Rachel are continuing to have conversations with OSU to further refine the proposal. They expect that the proposal will be ready for review by the RM&E Team at the May team meeting.

  → **ACTION:** Rachel will work with researchers to finalize proposal based on comments from the RM&E Team, and provide an update to the RM&E Team at the May RM&E Team meeting.

- **Chinook Pre-Spawn Mortality Study:**
  Rich updated the group regarding the status of this proposal. The Corps had serious concerns that the proposal was missing important aspects including: 1) how the hatchery program and study would be managed in order to complete the objectives of the study; and 2) it did not account for the effects on adult fish occurring downstream. These same concerns were identified last year;

however, the study was not implemented due to low runs. As a result of these concerns, the intent, this year, is to fund preparation of an implementation plan that works out the logistical details so that the study can be implemented next year (2019).

Ricardo noted the portion of the study that did go forward last year (2017) was at Fall Creek to add data to the preconstruction baseline. A report will be provided for RM&E review when available. Redd and carcass surveys above and below the dam were conducted prior to the new trap being completed, allowing estimates of PSM. The new trap is now up and running, and had a good first day and collected eleven winter steelhead, one spring Chinook, and many cutthroat and rainbow trout. A study of PSM above Fall Creek Dam was not considered appropriate for post-construction evaluation this year because the trap came online part-way through the season. The study will be considered for 2019 when the new trap is fully operational.

- **Foster Fish Weir:**
  Fenton reported that the fish weir was installed at the end of February. Things are progressing well: the weir evaluation for post-construction effectiveness and downstream passage survival is on schedule. They are currently conducting the Direct Injury and Survival Study for the lower pool evaluation and will evaluate fish passage and injury and survival at high pool in a few weeks after the reservoir is filled.

  Fenton appreciated everyone's efforts to get permitting for take completed in a very short-time frame, which occurred due to delays in the contracting process. Anne and Kelly suggested that, in situations where funding has not been approved yet or there is a contracting delay, it would be helpful to have earlier notice of the proposal so that NMFS and ODFW are alerted to the need for take and can be involved earlier to assist with permitting.

  → **ACTION:** Fenton will coordinate a meeting with NMFS and ODFW and any other interested team members to discuss how permitting guidelines and process for RM&E studies can be streamlined to address these concerns. This group will report the results of that meeting back to the RM&E team.

Lookout Point Alternative Operations Workshop

Fenton and Rich oriented the group regarding the purpose of the workshop regarding Lookout Point Alternative Operations. Rich reminded the group that in 2017, the team had identified a Deep Drawdown operation to be the highest priority of operations and one that was expected to provide the greatest benefits for juvenile fish passage and the lowest impacts on reservoir refill among the operations that were developed. Since then, the Corps concluded that they did not have authority for the operation, so it did not go forward. The Steering Team requested that the RM&E team consider other options. At the February 26, 2018 RM&E meeting, the team discussed the possibility of changing turbine operations at specific times during fall drafting in order to reduce entrainment and provide the opportunity for fish to go through the regulating outlets (ROs) instead.

The purpose of the workshop was to 1) review the major types of operations that are under consideration; 2) determine what is understood about their potential benefits, based on the latest data available from the 2017 PNNL study and other sources; and 3) refine the list of operations to the extent possible. Fenton reminded the group that any operations the group determines to bring forward, will still need to be vetted internally by the Corps and BPA to ensure feasibility.

To help the group prepare for this workshop, Rich sent the team a summary of various data and documents related to Lookout Point in an email dated April 24, 2017, including a document showing Lookout Point Active Tag Fish Passage and Survival Study – Fall/Winter 2017 – Preliminary Results, 3D

plots from the study that showed fish density at various depths during the passage study, and Appendix A to the OMET report (which contained ResSim modeling results for different operations in the Middle Fork). Rich noted that the ResSim modeling allows the team to consider, given the hydrology over the last 70+ years, what the reservoir elevation looks like over time and what the outflows look like over time, if the dam is operated differently with certain inflows coming in. How often the reservoir reaches key elevations will determine when and for how long various operations can be conducted.

Review of Operations:

Reduced turbine operation during fall draft:

This option involves drawing down to the minimum conservation pool along the normal rule curve, and then reducing turbine operations as the elevation approaches and first holds at minimum conservation pool to encourage fish to exit through the ROs when most are expected to move out of the reservoir (based on fall 2017 PNNL study). The depth to the RO is about 90 feet below the minimum conservation pool. It was noted that PNNL's data, the screw-trapping data, and the data from other projects generally suggest that very few juvenile Chinook have been observed leaving the reservoirs at such depths. Fenton noted that even when the ROs are operated at Lookout Point at minimum conservation pool, very few, if any Chinook pass, as they are not likely to sound that deep.

James reviewed the 2017 Fall study and 3D plots that showed fish density in the LOP forebay at various depths. The time frame for the plots was the entire study season for the fish that were released in December (Dec-Jan timeframe for fish arriving at Lookout Point) and the pool elevation was 822-830 feet.

He noted, in the 3D plot showing a depth at less than 2.5 meters, that the majority of fish are in the near forebay concentrated towards the center, between the powerhouse and the spillway. There are fewer fish concentrated near the powerhouse or dam face as the plot descends vertically down to the RO depth. He noted that the majority of fish observed in the 3D plots are in the top 5 meters of the water column, and very few fish are observed as the plots descend to the RO depth.

Rich observed that study does not given an indication of RO usage because the ROs were not operated during the 2017 study. However, given the distribution of fish, the study suggests that fish are not readily distributing at the RO depth and consequently, RO passage at minimum conservation pool is likely to be limited. Mike observed that the minimum conservation pool does not appear to be the most efficient way to move fish through. He noted that the study provides information on fish moving down to the forebay, as well as passage and could aid in the understanding of timing. Rich noted that research using gillnet and near-shore information suggests a general seasonal movement of fish congregating in the forebays as the summer season progresses, with density increases in a general sense by late summer, with fish congregating in the forebay. Screwtrap data also indicates a number of fish exit after the reservoir elevation drops to the minimum conservation pool. Mike noted that the drafting may occur at different times in the future, so timing may differ, and it is helpful to know more about variation and movement through the reservoir with different pool elevations.

James noted that night appears to be the driver for the fish activity. Greg Taylor observed that fish move opportunistically and were unlikely to pass if the turbines were off because there would be no flow attraction. It was noted that the turbines at Lookout Point are not designed to run as Spill/No Load; the turbines need a substantial amount of water to run and when shut off, nothing can go through.

The group concluded that this operation was unlikely to pass many fish as fish are unlikely to sound to the RO at the minimum conservation pool elevation. The group also acknowledged that, based on this conclusion, there would not be a fall operations test.

Delay Refill and Spring/Summer Spill and Spring Surface Spill:
Cindy Bowline reviewed the ResSim modeling with the team. Cindy noted that the period of record used for the ResSim modeling is 1935 – 2008. It does not cover the past 10 years, including 2015, which was the driest year on record. She noted that the modeling indicates that, in 75% of the years, there is an opportunity for spill after delayed refill. In approximately 25% of the years, which approximately corresponds to the proportion of deficit or insufficient water years in the record, there is not enough water for a delayed refill and spill operation.

The team discussed that, while a delayed refill and spring spill operation has potential to improve juvenile passage conditions implementation annually may be difficult because we can't predict whether spill will happen every year (i.e. spill would provide a positive benefit to fish; however, it cannot be guaranteed on a yearly basis). It was also noted that a delayed refill operation in a dry year may jeopardize having that water available to supplement mainstem flows. It was suggested that these operations could be considered as a suite of solutions that could be in place and implemented during the appropriate water year. It was also suggested that RM&E testing be staged in a similar way so that researchers were ready to test spring spill conditions, and the final decision of which spring operation to test could be made in February. Other considerations for the operation include the level and length of spill, as well as the impact to downstream flow targets, temperature management and hydropower.

The team agreed that the next step is to prepare a concept paper that delineates ResSim modeling runs that would consider how often delayed refill and spring spill and fall spill could occur, the spill level that occurred by year, and how Hill Creek could supplement the operation to provide the maximum opportunity for spill.

→ **ACTION:** Fenton will prepare a concept paper that delineates specific ResSim modeling runs related to potential delayed refill and spring/fall spill operations.

FY19 RM&E Planning Table Discussion – North Santiam
Leslie provided background on the draft North Santiam FY19 RM&E Planning Table (a separate document) which is a revision of the original table created at the Joint RM&E/Steering Team meeting on March 22, 2018. Kelly, Leslie and Rich agreed to revise the tables created at the joint meeting.

The planning table is designed to help the Steering and RM&E teams identify information needs for FY19 and beyond. The intent is for the Steering Team to focus on the planned actions/issues under the BiOp and the decisions that are needed for those actions (columns 1 and 2). The RM&E team can provide information that informs the decisions by identifying the current information that is available and the gaps in information (columns 3 and 4). It was noted that this table is still in draft form and the Steering Team is expected to provide feedback on it at their next meeting on May 1, 2018. For this RM&E meeting, the RM&E team reviewed columns 3 and 4 and provided recommendations on concept papers for each planned action/issue. A brief summary of the discussion of each Planned Action/Issue is provided below.

	Planned Issue/Action	**Discussion/Action Item**
1	Interim operation of Detroit Dam for temperature targets	A concept paper, APH-18-03 already exists. Rich will revise, if needed, for FY19.
2	Operation of temperature at control tower	This is a future action and RM&E is not needed at this time.
3	Interim actions to manage TDG before fish passage improved at Detroit Dam	As a first step, Ricardo will provide a summary of current information to the RM&E team at the May meeting. After RM&E team input, the summary will be presented to managers to determine if there is sufficient information to support management

		decisions. If there are information gaps, these will be clarified and an existing concept paper, FMWQ-18-04- SYS can be revised, if needed.
4	Manage TDG AFTER fish passage improved at Detroit Dam	This is a future action and RM&E is not needed at this time.
5	Release of adult wild fish in the North Santiam BEFORE fish passage is improved at Detroit Dam	Column 4 should include a comprehensive evaluation of actual and potential production. Diana and Dave will prepare a new concept paper.
6	Reintroduce wild spring Chinook salmon above Detroit Dam AFTER fish passage is improved	This is a future action and RM&E is not needed at this time. Note: in the concept paper under #5, Diana and Dave will consider whether there is any information related to this future action that could be called out in the concept paper.
7	Evaluate post-construction effectiveness of Minto AFF for adult Chinook and steelhead	It was noted that the existing data does not indicate issues with collection efficiency or adult survival (PSM is consistently low since 2012 for adult spring Chinook released above Detroit). The RM&E Team did not recommend that a concept paper be developed at this time.
8	Downstream fish passage design – conveyance method to below dam	The team agreed to review the revised copepod concept paper and determine if this information need is addressed by that concept paper.
9	Downstream passage design – forebay guidance to FSS	Rich will check with the Project Delivery Team regarding any information needs. Rich will prepare a concept paper, if warranted.
10	Remove or modify revetments	This will be moved to the system-wide table as it applies to all sub-basins.

Next Steps and Action Items

Rich agreed to revise the draft North Santiam planning table to include the teams' recommendations and discussion. The updated table will be sent to the Steering Team for review. The team agreed that the concept papers identified should be prepared for review at the May RM&E Team meeting, so that the review process can stay on track. The team will discuss planning tables for the other sub-basins at the next RM&E team meeting. Fenton also reminded team members that there are reports out that are overdue for comments. He asked team members to let him know if they will not be providing comments. He extended the date for comments for the TDG report to May 1 and the date for comments for the South Santiam Spawning Surveys to May 3.

→ **ACTION**: Rich will revise the North Santiam FY19 RM&E Planning Table.

→ **ACTION**: Rich, Diana and Dave will prepare concept papers for review at the May RM&E Team meeting.

Nancy thanked the group and adjourned the meeting.

Next Meeting: The RM&E Team will meet on May 24, 2018, from 9am -1 pm.

This summary is respectfully submitted by DS Consulting. Suggested edits are welcome and can be sent to nancy@dsconsult.co.