Willamette Action Team for Ecosystem Restoration (WATER)
Research, Monitoring and Evaluation (RM&E)
January 25, 2018 Conference Call

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

DRAFT v.2 Facilitator's Summary

ACTION	BY WHOM?	BY WHEN?
Provide regional comments on Pre-Spawn Mortality proposal (Riccardo); ensure NMFS comments have been provided to the Corps (Diana).	Ricardo/Diana	ASAP
Register for the 2018 Willamette Science Review.	All	ASAP
Follow-up with Steve Gagnon of the Habitat Technical Team regarding the Sub-basin planning schedule.	Rich	With updated schedule
Update Middle Fork RM&E Study Schedule to reflect the current status as Version 2; send the updated plan to the team.	Rich	ASAP
Update the RM&E Team on the status of the Spring Spill test.	Fenton	Late February
Verify the PFFC study's timeframe.	Rich	ASAP
Team members will review concept paper and provide comments.	RM&E Team	2/1/18
Discuss support for a bypass tube option with Steering Team counterparts.	RM&E Team	ASAP
Send the team copies of Monzyk, et. al., studies.	Ricardo & Jeff	*[Completed 1/24/18]*
Summarize existing data available in ODFW archives; share with Toby and Russ.	Jeff	ASAP
Conduct a power analysis for a three-year and five-year release study that also looks at .0001 and .00025 baseline survival.	Toby and Russ	ASAP

Participants on the phone: Leslie Bach (NPCC), Diana Dishman (NMFS), Dave Griffith (USACE), Mike Hudson (USFW), Fenton Kahn (USACE), Toby Kock (USGS), Russ Perry (USGS), Rich Piaskowski (USACE), Christine Peterson (BPA), Shane Scott, (Public Power Council), Ricardo Walker (USACE), Jeff Ziller (ODFW);

Facilitation Team: Emily Stranz and Nancy Pionk (DS Consulting).

Welcome and Updates
Emily welcomed the group and conducted a round of introductions. The team approved the 1/4/2018 meeting summary with additional edits provided by Rich and Diana. Team members provided an updated status on the 1/4/18 action items list (rolled-over "to-dos" are noted in the action list above).

Emily noted that DS Consulting is working on planning a joint RM&E/Steering Team meeting, which will be discussed at the 1/30/18 Steering Team meeting. It is expected that this meeting will be scheduled for March.

Diana reported that NMFS submitted the WFOP change request for the fin clip collection protocol; the request was accepted for Corps facilities and Tammy Mackey will follow-up with contracted facilities to see if they can implement the protocol as well.

Rich indicated that this month's progress on the sub-basin plans was limited due to other duties taking priority at the beginning of the year. The schedule for the 50% review has not yet been determined, however, the Corps will report back to the region once it is.

Block treatment design for LOP spring spill study

Fenton reviewed the draft block treatment design for the spring 2018 spill test at Lookout Point. He explained that the spill test will help inform where fish are passing and where a potential collector might be placed. The spill will fluctuate between two different spill bays where fish have previously been seen passing (1 and 5). The spill will occur within 24-hour periods, starting at 1600, with the intent of capturing passage for both evening and morning hours when fish are most likely to pass.

Fenton noted that the spill blocks were pseudo-randomized. Two-day blocks could not be done on the weekends because the project is operated manually and does not have maintenance personnel available on weekends. He will ask the researchers to do an informal comparison to see if there is a duration effect comparing the one-day and two-day blocks that are scheduled in the treatment plan.

The projected date for starting the spill is March 17, with the fish being released a few days before that. [*Facilitator Note: In the editing process, NMFS noted that PNNL and the Corps have since requested to release fish in mid-February to capture behavior further in advance of spill operations*.] The actual start date will depend on the water year, rule curve, and available spill. Mary Karen Scullion has run the model at 50% and 90% of weather patterns and she indicated that the timing seems reasonable, given the current available information. If February or early March conditions are really dry, the start date will shift to late March/early April when the reservoir gets to the spillway crest. It is expected that late April would be too late to start the test, as the fish will have already migrated out. BPA is still reviewing the operation, however, after initial conversations did not raise any red flags. Fenton will continue with coordination and provide the team an update in late February. **RM&E**

Team initial review of JPL-18-xx-MF (Copepod study)

Ricardo presented the concept for a potential study of copepod infections in the Cougar Dam reservoir. Ricardo shared that the objectives of the study are to:

1. Determine survival of juvenile Chinook salmon handled and held in simulated conditions similar to what is currently planned at the Cougar Floating Screen Structure.
    a. Relate survival to copepod infection, disease, temperature, duration, fish size, fitness, and other relevant factors.
2. Determine seasonal prevalence of copepods in Cougar Reservoir.
    a. Relate seasonal prevalence of copepods to intensity of juvenile Chinook salmon infestation.

Copepods are associated with high mortality in reservoirs and copepod infection greatly impairs swimming ability for fish collected from Cougar reservoir according to a recent study (Herron et al., in press). The study will examine how the infection affects downstream mortality and inform discussion regarding the design of the collector and whether another means of downstream transport would be more successful. It would also provide an opportunity to look at early season passage for 2019.

It was noted that a hypothesis exists that adults may be part of the cycle that maintains the copepod levels and that treatment of adults may reduce copepods being introduced into the reservoir. Team members were invited to provide ideas on how the copepod life cycle could be interrupted.

A question was raised as to whether the information from the study will be available when it is needed for design. Rich will verify the study's timeframe relative to Cougar design/engineering decision points. It was also

suggested that the proposal clearly indicate how this information would inform design, as the PDT is already underway with their design work.

Both Ricardo and Jeff knew of Monzyk, et. al., studies that should be reviewed, as they may shed light on the issue; they will send these studies out to the group (*Life-history characteristics of juvenile spring Chinook salmon rearing in Willamette Valley reservoirs (*2012 and 2013) and *Infection of Juvenile Salmonids by Salmincola californiensis (Copepoda: Lernaeopodidae) in Reservoirs and Streams of the Willamette River Basin, Oregon* (2015).)

A question was asked regarding whether the PDT is considering a bypass tube. Currently, the PDT is looking at trap and haul as the preferred alternative for the collector. However, Corps biologists believe that a tube bypass should be considered, as there is biological merit. They pointed to high O&M costs as a potential sticking point for the bypass tube. Fenton noted that preliminary information from the High Head Bypass Pipe Study will be presented at the science review and the PDT is aware that this data is forthcoming. Rich requested that team members indicate their support for a bypass pipe at Cougar, or support for at least further investigating this approach. Several team members, including NMFS, ODFW, and USFWS, voiced support for further investigation of a bypass tube at Cougar, although NMFS noted that they defer to their engineers for a decision on whether or not to recommend a bypass pipe to the PDT. Rich indicated that this is a critical point in the design phase and support should be voiced sooner than later to ensure that the PDT fully considers the option.

Team members were asked to provide comments on the concept paper by February 1, 2018 and discuss their support for a bypass tube option with their Steering Team counterparts.

→ **Action:** Rich will verify the study's timeframe. Team members will review concept paper and provide comments by February 1, 2018. Team members will discuss support for a bypass tube option with their Steering Team counterparts. Ricardo and Jeff will provide the Monzyk, et. al, studies to the team.

Progress Update on Middle Fork HOR Survival Study Concept Paper

Diana reported that she checked with Lance Kruzic regarding HGMP parameters and potential limitations of large releases needed for the MF HOR survival study. Lance currently did not see any red flags or limitations on the number of fish released based on the HGMPs. However, he requested that the RM&E team keep him informed about any plans for release.

Toby and Russ reviewed the results of the power analysis they conducted for the Middle Fork HOR Survival Study. They were requested to do the power analysis to estimate the sample size that would be needed for the study which would look at Fry-to-Adult Returns (FARs) for fry-sized fish released above Lookout Point and below Dexter Dam. Their analysis looked at what sample sizes were required to detect a difference in survival for two release groups for a single year study and 5-year study. They noted that the power to detect a difference depends on:

- Baseline fry-to-adult survival
- Effect size (percent reduction from baseline)
- Number of fish released in each group

Their analysis showed that:

1) 75,000 fish would be required to detect a 50% survival effect size with 80% power, assuming a baseline survival rate of 0.0005 (PowerPoint Presentation, Slide 3, Graph1);
2) 35,000 fish would be required to detect a 50% survival effect size with 80% power, assuming a baseline survival rate of 0.001 (PowerPoint Presentation, Slide 3, Graph 2); and,
3) 15,000 fish would be required to detect a 50% survival effect size with 80% power, assuming a baseline survival rate of 0.002 (PowerPoint Presentation, Slide 3, Graph 3).

These sample sizes are per release group, so the actual numbers of fish released per year would be twice these reported values. They noted that if the effect size is much smaller (25% or less), very large sample sizes would be required. They identified limitations on the study design, including that effect size and direction are unknown. Multiple years of data can increase effective sample size and power.

Team members noted the large sample sizes required and raised concern about the impact of the size of releases compared with the value of data that might be obtained from the study. It was suggested that the existing available data be mined first. Jeff noted that ODFW has progress reports on adult returns that could inform the study and power analysis. It was suggested that it could be helpful to look at adult returns in the North Fork Middle Fork, and unmarked returns at Dexter Dam, and compare survival over the last 20 years.

Questions were also raised about whether there was sufficient production capacity to raise and release such large numbers of fish. Jeff indicated that there was pond space available at McKenzie hatchery for approximately 600,000 fish to be raised to smolts.

Team members indicated they would like to see refinement of the power analysis based on a multiple year approach to increase the power and account for environmental variability.

→ **Action**: Jeff will provide a list of existing data that are available in ODFW archives and share it with Toby and Russ. Toby and Russ will do a power analysis for a three-year and five-year release study that also looks at .0001 and .00025 baseline survival. They will send revised scenarios to DS Consulting for distribution.

Closing and Next Steps:

Emily will follow-up with the team regarding scheduling of the joint RM&E and Steering Team meeting and any additional needs for a technical meeting with the RM&E team only. RM&E team members will complete their assigned tasks to help the various concepts discussed move forward. Emily thanked the group and adjourned the meeting.

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