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ANADROMOUS FISH EVALUATION PROGRAM  
Fish Facility Design Review Work Group  
Minutes  
July 30 and 31, 2003

Name	Organization
Noah Adams	United States Geological Survey (USGS), Biological Research Division
Martin Ahmann	U.S. Army Corps of Engineers (Corps)
Ron Boyce	Oregon Department of Fish and Wildlife (ODFW)
Jim Cain	Corps
Linda Carter	Corps
Kevin Crum	Corps
Scott Dunmire	Corps
Rick Emmert	Corps
Kim Fodrea	Bonneville Power Administration (BPA)
Alden Foote	Corps
Carolyn Foote	Corps
Gary Fredricks	National Oceanic and Atmospheric Administration [NOAA previously known as National Marine Fisheries Service (NMFS)]
Gary Hagedorn	U.S. Fish and Wildlife Service (USFWS)
Kenneth Ham	Pacific Northwest National Laboratories (PNNL) [formerly known as Battelle Pacific Northwest Laboratory (Battelle)]
Walt Haerer	Decision Support
Bill Hevlin	NMFS
Fred Higginbotham	Corps
Dave Hurson	Corps
Rebecca Kalamasz	Corps
Mark Lindgren	Corps
Dave Linehan	USFWS
Tom Lorz	Columbia River Inter-Tribal Fisheries Commission (CRITFC)
Jerry McCann	Fish Passage Center (FPC)
Joyce McDonald	Corps - [Ice Harbor Lock and Dam (Ice Harbor)]
Robert McDonald	Normandeau Associates
Paul Ocker	Corps
Chris Peery	University of Idaho
Steve Pettit	Idaho Department of Fish and Game (IDFG)
Mark Plummer	Corps - Ice Harbor
Cary Rahn	Corps
Steve Rainey	NMFS
Lynn Reese	Corps
Ann Setter	ODFW
Marvin Shutters	Corps
Mark Smith	Corps

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Danielle Stephens	Corps
Larry Swenson	NMFS - (via telephone)
Ben Tice	Corps
Tim Wik	Corps
Dave Wills	USFWS - (via telephone)
Rod Woodin	Washington Department of Fish and Wildlife (WDFW) - (via telephone)
Karen Zelch	Corps
Tonia Elsey	Corps

The Fish Facility Design Review Work Group (FFDRWG) meeting was held in the Harvest Room on July 30 and 31, 2003, at the U.S. Army Corps of Engineers (Corps), Walla Walla District (District), 201 North Third Avenue, Walla Walla, Washington. Marvin Shutters facilitated the meeting, and Tonia Elsey served as note taker. The meeting was audio taped in order to facilitate completion of the minutes.

Marvin Shutters distributed the agenda (see appendix A, handout 1). There was discussion on a date for the next FFDRWG meeting. After much deliberation, November 5-6, 2003, was scheduled for the next FFDRWG meeting.

Ron Boyce asked if there was going to be some kind of a special Study Review Work Group (SRWG) or FFDRWG discussion meeting when the survival data on the Ice Harbor Passive Integrated Transponder (PIT) Tag testing became available. Marvin Shutters stated that when the survival data becomes available it would be up to the Technical Management Team (TMT) to decide on continued operations through the summer. It was suggested that there be some kind of a scientific scrub or discussion to decipher the data with SRWG before it goes to TMT. It was decided that Mark Smith would take the lead on putting an SRWG conference call together when the survival data becomes available.

Marvin Shutters stated that one piece of information that the Corps has been waiting for on continuing operations through the summer at Ice Harbor was the concerns for the stilling basin. He stated that Lynn Reese would give a short explanation of what the conditions and concerns and what the Corps is doing to resolve the problems. Dave Hurson stated that the north powerhouse fishway (could not hear) gate. He stated that the gate was just installed last year and cost approximately \$50,000. He explained the damage that was done and what the project people did to repair it.

Martin Ahmann showed a video of the tailrace conditions and activity at the stilling basin and explained the conditions. Marvin Shutters stated that the video shows bays 2, 3, and 4. The balloon tag study was conducted in bays 4, 5, and 6, so the conditions shown in the video were different from the conditions present during the balloon tag study. There was discussion on the activity in the bays shown in the video.

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Lynn Reese showed an overhead (see appendix A, handout 2) depicting a cut through of the stilling basin at Ice Harbor with a tailwater elevation of 354.6 and chart of the recommended discharges (various tailwaters) at the Ice Harbor spillway. Lynn explained the Corps' findings in the stilling basin at Ice Harbor. He stated that they have found that in order to not create conditions that will damage the baffle blocks, the flows should not exceed 10,500 to 11,000 cubic feet per second (cfs). There was discussion on the stilling basin problems. Mark Lindgren explained that some modeling information shows that running flows at 15,000 cfs will damage the baffle blocks and end sills. Discussion continued.

1. Ice Harbor Direct Injury Study Update. Mark Smith distributed handout 3 (see appendix A, handout 3). Mark stated that the balloon tag tests conducted at Ice Harbor were conducted using two conditions (8-stop spill for 1 1/2 days and a 2-stop spill for 1 1/2 days). He stated that there were two releases in the 8-stop spill test, one release was approximately 3 feet above the OG ogee (deep release), and the second release was approximately 7 feet above the OG ogee (what is an OG?). The 8-stop condition produced a fish injury rate of approximately 20 percent in the deep release test, and the fish released at the 7-foot condition produced a fish injury rate of approximately 3 percent. He stated that his interpretation of these balloon tag tests would be that it is extremely important where fish pass over the OG. There was discussion on the results of the balloon tag tests.

Mark Smith stated that the team ran a camera through the pipes and found that there are no fish passage problems s. pipes. Marvin Shuttles stated that the summer PIT tag data should be available some time next week, and the spring radio telemetry survival data should be available around the end of August. Discussion continued on the results of the balloon tag tests. Marvin Shuttles stated that after all the data is in there can be a discussion in greater detail on what additional data is needed at the combined SRWG/FFDRWG meeting and establish a better game plan for the direction of next year's study plan.

2. Crescent Island. Dave Linehan stated that the one key question that the USFWS has was the (could not hear). He stated that the Crescent Island (could not understand) colony has been part of the discussions and negotiations with the Corps and fish and wildlife agencies in the east Sand Island Environmental Impact Statement (EIS). He stated that it was agreed that the Crescent Island population would not be part of the east Sand Island EIS. It was agreed that NMFS would study the available PIT tag data from the Seattle science center along with the population data of the islands. The 7 years of data collected on the population of Crescent Island is being studied to aid in understanding the predation of juvenile salmon of the Columbia River. Crescent Island will have a separate EIS. Dave Hurson gave a short history on the development of Crescent Island. There was discussion on the population of Crescent Island. Dave stated that one key thing to keep in mind is that the size of the caspian term colony at Crescent Island is really self-limiting. He stated that the colony on Crescent Island is mainly California gulls. There was discussion on the amount of predation coming from Crescent Island. Dave explained the different studies that are currently being

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conducted on all the surrounding islands. Ron Boyce asked if the Corps was paying for Robey's (need Robey's whole name) study work or if his work was part of the BPA funding that was just chopped. Kim Fodrea stated that the funding for Robey's work is going to be phased out because it is not a power responsibility. It was stated that these studies should be the responsibilities of an action agency.

Rebecca Kalamasz asked what the general approach for developing a management plan for the predation at Crescent Island would entail. She stated that it would make sense to try the balanced approach, where you would attempt to determine what population size can be maintained without predation. There was continued discussion on the predation studies.

3. Ice Harbor Removable Spillway Weir (RSW). Kevin Crum distributed handout 4 (see appendix A, handout 4). Kevin stated that he had received good news last Friday. He stated that there have been a lot of problems with the computer program used to descend the RSW. Last Friday, the architectural engineer (AE) finally had a successful descent under control. It took 1.8 degrees per minute to lower the RSW. Kevin stated that it takes approximately 8 hours to go from upright to 30 degrees because of the air, and only takes approximately 3 hours to go from 30 degrees to the bottom.

Kevin stated that his team has been working with Environmental Services and Jacobs [the same engineers that did the Lower Granite Lock and Dam (Lower Granite) RSW project] and currently have a sectional model designed. The design plans depict a 1 to 25 scale model with three bays and one turbine bay and is scheduled to have construction complete by October 2003. Kevin explained the plans for the model. He stated that the removal conditions at Ice Harbor are different from those at Lower Granite. He stated that there would almost have to be project flood conditions at Lower Granite before removal at Ice Harbor would be necessary, which would only happen maybe one time in 100 years. The schedule for installation is still 2005. In order to obtain a 2005 installation, the design has to be at an approximate 15-percent completion by October 2003.

Kevin stated that in order to move forward and make informed decisions, the team needs the Ice Harbor spring/summer spillway survival data, sectional model testing, bathymetry data, and the Lower Granite RSW spillway survival data. Kevin went over the three potential approaches that have been set up to continue with RSW design at Ice Harbor (see appendix A, handout 4). There was discussion on the RSW at Lower Granite, existing differences between the two projects, and the spillway survival problems.

Ron Boyce stated that because the RSW is such a major budgetary item, a good decision document would need to be written for the regional agencies to study and make sure it all makes sense to proceed. Kevin Crum stated that the team will need to establish what the budgetary needs will be for fiscal year (FY) 2004 to continue the RSW study and design. Discussion continued on the prospective RSW at Ice Harbor.

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4. Lower Granite Preliminary RSW Tests. Noah Adams distributed handout 5 (see appendix A, handout 5). Noah stated that the handout did not show spring survival data. He stated that the survival data should be available by early September. The handout shows preliminary data from the 2003 RSW tests at Lower Granite. Noah explained the preliminary data on the handout. Noah stated that the most important take home message for this test was without the Behavioral Guidance Structure (BGS) there might be a reduction in the RSW efficiency, but the tests did not show any great impact in the RSW efficiency without the BGS. There was discussion on the RSW and BGS at Lower Granite.

5. Lower Granite BGS. Kevin Crum distributed handout 6 (see appendix A, handout 6). Kevin stated that the work on the Lower Granite surface bypass collector (SBC) needed to be looked at in the respect to what had been done in the past and how fish respond to the trash boom. By looking at the SBC and the trash boom, the team could put more detail into what they are proposing to do at Lower Granite next year. The BGS was installed in 1998 with the idea of installing the most economical structure to test the idea of powerhouse occlusion, guiding (could not understand) horizontally in the forebay to the surface collector. Modifications have been made. Kevin stated that the existing BGS has approximately 2 years of life left. He stated that right now the team is looking at forebay guidance structures at The Dalles Lock and Dam (The Dalles) for installation at Ice Harbor (possibly in combination with the RSW) and Lower Monumental Lock and Dam (Lower Monumental). Kevin stated that the BGS work done at Lower Granite was originally conservative. He stated that his team is looking at Lower Granite as a place to test the BGS less conservatively with the idea of a potential application at other projects. The work plan now is to reduce the BGS (in depth) by 20 feet and change the angle substantially to see if the effect of the changes can make an improvement. There was discussion on the existing BGS, the possibility of changing it, and testing it for possible use at other projects.

6. Lower Granite RSW Summer Evaluation. Tim Wik stated that the summer evaluation seems to be the highest priority item for the RSW at Lower Granite in 2004. He stated that the test would likely be a radio telemetry test. The team has conducted hydro-acoustic tests with the SBC and came to the conclusion that those tests did not work very well. There was discussion on the radio telemetry and hydro-acoustic tests.

Steve Pettit stated that according to Kim Fodrea there is a genuine collection on whether the (could not understand) is going to go in the direction of summer spill and transport study. Kim Fodrea responded to the question of whether or not BPA still supports the study by saying that BPA is pushing for cost reductions. She stated that BPA is still trying to maintain and increase fish survival, but obviously summer spill increases do not move in that direction. The BPA has not made any formal statements that they are not going to do the test, but it is obvious that it is coming. There was discussion on the summer spill test.

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7. McNary Lock and Dam (McNary) Snake River Action Plan. Rebecca Kalamasz stated that she was going to give a status of where the team is on the action plan, what they are doing (see appendix A, handout 7, for copy of overhead presentation), discuss some of the configuration and evaluation tools that will be used, and obtain some schedules from the regions. She stated that the action plan was created as an activity that takes all construction and operation decisions to make improvements for fish and puts them into a consolidated plan that enables the Corps to get closest to meeting the targets in the Biological Opinion (Bi-Op). Rebecca distributed an expansion of the overhead presentation (see appendix A, handouts 8 and 9) and stated that it depicted some completion estimates. She stated that this type of process requires formulation of concepts. She stated that the team has gone through the baseline, identified all technical elements, laid out operational configurations, and has begun their preliminary concept configurations. The team is using the performance measures of the 2000 Bi-Op for evaluating the concepts. She stated that at this time the team is mostly working on the evaluation tools, ensuring that their comparison and sensitivity analysis model has the suggested and requested modifications as well as the correct data. Once all the data is in place, the team will start observing the survival performance.

Gary Fredricks stated that NMFS is going through the process of putting together another biological effects team similar to the one used for drafting the 2000 Bi-Op. The purpose of this biological effects team would be to develop a set of parameters or a range of parameters that all the agencies can agree to for passage survival efficiencies. There was discussion on the biological effects team and what it will need to do.

Rebecca stated that the action plan team's intent is to take a preliminary look at the runs, get to survival, and continue with the comparison of the concepts through sensitivity analysis. Once they have done that, they will meet with the region to discuss the details of the concept development that feeds into the selection criteria, identify the decision points, and develop a long-term plan. There was discussion on the action plan. Rebecca explained some of the different concepts on which the team has been working. Discussion continued on the action plan. Rebecca stated that she wants to have a meeting in late August with the region to discuss the pre-configurations, results of the runs, and some of the selections.

Walter Haerer from Decision Support gave a presentation on the System Passage Analysis Tool (SPAT) that his company has developed for the action plan (see appendix A, handout 10, for copy of overhead presentation). Mr. Haerer stated that SPAT improves in Simulation Language Based on Pascal (SIMPAS) and the Fish, Gas, Power Integrated Analysis (FGPIA). Mr. Haerer explained the model and demonstrated different spreadsheets. There was discussion on the SPAT spreadsheet program.

Rebecca Kalamasz suggested scheduling a regional meeting to discuss the data values, input parameters, equations, *etc.*, needed for the SPAT spreadsheets in more detail. Ron Boyce suggested incorporating people that work on the comparative survival study and have them bring some decisions to the oversight committee (Michelle Last name?, FPC would be the point of contact).

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Mr. Haerer continued explaining the SPAT model. Mr. Haerer stated that the agencies would need to agree on the location of the head of the pool at Lower Granite. There was continued discussion on SPAT. Ron Boyce suggested that the states and tribes be involved in the regional meeting on the SPAT model. He suggested that adult fish passage data be incorporated into SPAT. There was discussion on who should be involved in the regional meeting. Rebecca Kalamasz stated that she would send an electronic mail (e-mail) with the SPAT PowerPoint presentation and the objectives needed for the SPAT model.

8. Lower Monumental Parapet Wall. Rick Emmert stated that the installation of the end bay deflectors in the stilling basin was finished last year. He stated that part way through the year the project biologist noticed that fish were being stranded up on the decks of the north and south side of the spillway. There was a lot of wave action and spray off of the end bay deflectors and stranding juvenile and adult fish. Dave Hurson stated that it happened during the higher flows in May (involuntary spill). Rick stated that in addition to stranding fish, some electrical equipment that runs the fishway was also getting a lot of water. Dave Hurson stated that handrails were also being torn off. The project reduced the spill enough to remedy the problem. Rick stated that he developed an annual work plan for SCT to consider the building of some parapet walls along the sides of the training walls to contain some of the spill and protect the electrical equipment. Steve Rainey explained the current spill patterns at Lower Monumental and recommended that the Corps do some more modeling on spill patterns as part of the end bay flow deflector development. There was discussion on the existing spill patterns at Lower Monumental. Rick Emmert stated there is no money budgeted for modeling. Bill Hevlin stated that they should try operational changes. There was discussion on the need for additional modeling. Dave Hurson stated that changing the spill pattern would only involve the times when they have involuntary spill. Rick Emmert stated that he would revise his cost estimate to include modeling and just a possible design of a parapet wall. There was discussion on the parapet wall, continued modeling, and spill patterns at Lower Monumental. It was decided that FFDRWG would look at the cost estimates, make the necessary revisions, and check in-house to see what other activities might be able to share costs associated with the (could not understand).

9. McNary Modernization Update. Rick Emmert stated that McNary is 50 years old and has had no significant investments (see appendix A, handout 11, for a copy of the overhead presentation). McNary needs a lot of upgrading. Rick stated that McNary Modernization is interested in upgrading the turbines to increase their efficiency and reliability. He stated that the Corps also wants to maintain or improve survival and improve water quality. He stated that the team is conducting an environmental assessment (EA). Rick explained the alternatives covered in the EA. He stated that the alternatives would require biological testing, procurement and installation of a runner (with some prototype testing), rebuilding some vertical barrier screens (VBS), and conducting tests on gatewell conditions. He explained the preliminary schedule set for the McNary Modernization turbine upgrade.

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Rick stated that the team is going to need a subgroup to assist in working through the biological testing requirements and logistics. There was discussion on the biological testing. Ben Tice distributed a draft McNary Modernization biological testing plan (see appendix A, handout 11a), and asked the agencies to submit comments. Ben stated that eventually this biological test plan would be incorporated into the Biological Assessment for Endangered Species Act (ESA) consultation. There was continued discussion on the biological testing. A subgroup meeting was set for Thursday afternoon, August 7, 2003, in Portland. It was suggested that Mark Smith put together a list of what needs to be discussed and e-mail it to the participants.

Martin Ahmann distributed the 2004 test plan for VBS (see appendix A, handout 11b). Martin stated that three VBSs would be tested next year. He stated that NMFS had identified concerns with the VBS units and their discharge increasing, (could not hear) gatewells causing a greater potential for debris accumulation, and increase in turbulence in the gatewell. Last June, at a FFDRWG subgroup meeting, three screen types were identified that the team would like to pursue. Martin explained each of the three screen types and the testing plan for 2004. Martin stated that the team would like to do the testing in March after the juvenile fish facility becomes operable. By conducting the test in March, the test would continue throughout the fish season to include in-river fish. He stated that would give them an evaluation of in-river fish and debris as it comes down the system. There was discussion on the VBS testing. Martin stated that the team started with an evaluation of an Extended Submerged Bar Screen (ESBS) to develop a design for the high unit discharges. He stated that page 2 of the handout (see appendix A, handout 11b) shows the summary of those model results. He explained the summaries in the handout. The team made an interim decision to stay with the existing VBSs at McNary. There was continued discussion on the VBS testing. Martin stated that there were concerns that the team was putting more flow up the gatewell, creating a more turbulent environment. He stated that they did a comparison of the Lower Granite gatewell to the McNary Modernization and found that there is actually less flow per unit volume at McNary with the new VBS and proposed new turbine. Discussion continued. Steve Rainey stated that the important resolution is to identify sensitivity of debris buildup to gatewell flow. It was decided to conduct some modeling next spring on Fish Guidance Efficiency (FGE) and debris buildup to gatewell flow.

10. Fish Transportation Oversight Team (FTOT) Report. Dave Hurson stated that the FTOT committee is behind on the annual reports. He stated that their main objective is to get all the annual reports caught up. He stated that Operation Division is going to add a full-time biologist that will help keep the annual reports up to date.

11. McNary Spillgate Hoists. Rick Emmert stated that his team has recently completed the tests on the load gates (see appendix A, handout 12, for a copy of the overhead presentation). Rick stated that the range of load for the gates went from 348,000 pounds to 510,000 pounds. The hoists for the gates are rated at 350,000 pounds, and the gantry crane is rated at 400,000 pounds. Dave Hurson asked what the original design weight was supposed to be. Rick stated that the original design



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dry-weight was 325,000 pounds. He stated that the Corps is presently conducting a value engineering (VE) study. Plans and specifications are 90-percent complete. The plans and specifications show replacement of everything (wheels, bearings, shafts, seals, etc.). He stated that to replace everything is too expensive, so the VE study is attempting to get the cost estimate back down to at least the \$3 million mark. Rick stated that the plan is to repair six gates to attempt to get the spillway back into service. He stated that the project could continue to use the old hoists by changing the lifting beams. Rick explained all the contingency possibilities (see appendix A, handout 12). There was discussion on the gates and hoists in the spillway at McNary.

12. McNary Forebay Temperature. Lynn Reese stated that there have been issues at McNary with respect to forebay temperatures and collection gallery temperatures that are causing fish problems. Lynn stated that this FY the Corps has been developing a Computational Fluid Dynamics (CFD) numerical model to have a tool to evaluate operational changes as well as potential structural changes (see appendix A, handout 13, for a copy of his overhead presentation). One piece of the CFD modeling is the collection of field data. This FY there is only funds available to get the CFD modeled, calibrated, and validated. Hopefully, next FY (if there are available funds) the actual evaluations can be accomplished. Lynn stated that the approach on the CFD is a three-stage process: (1) Reviewing existing data; (2) Developing a single turbine CFD model; and (3) Getting everything finished by the end of this FY for use in the future. Lynn explained the drawings and graphs in his overhead presentation (see appendix A, handout 13). There was discussion on the CFD and McNary forebay temperature problems.

Gary Fredricks asked what the intent of this program was, aside from McNary Modernization. Mark Smith stated that the intent of this program is to discover a way to reduce the water temperature problems in the forebay at McNary. Gary asked if this was a FFDRWG or operations and maintenance program. Lynn Reese stated that this program was one of the measures listed in the Bi-Op. Discussion continued on the CFD model.

Martin Ahmann stated that on the handout that he distributed earlier that depicted a comparison of gatewell volume and **slow?** (see appendix A, handout 11b) was incorrect. The comparison shown on the third page, last table, was between McNary and John Day, not Lower Granite. Discussion continued on the CFD model and the temperature problems.

13. Ice Harbor Auxiliary Water Supply (AWS) Sumps. Cary Rahn distributed handout 14 (see appendix A, handout 14). Cary stated that three pumps have been installed and are running on the north shore. Cary stated that the Corps has discovered some pretty serious contractor deficiencies in two of the three pumps. Pump number 3 is operating at a high level of vibration. The gear box in one pump exploded due to a rust issue. After a recent gear box inspection, rust was found in pumps number 1 and number 3. Cary stated that the Corps would pursue some kind of remedy through the construction and contracting clauses to have the gear boxes replaced. That does not,

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however, resolve the vibration issue. Pacific Northwest National Laboratory (PNNL) provided data collection using both acoustic and vibration data. The PNNL picked up a vibration issue that was in the order of magnitude of approximately 300-percent greater on pump 3 than on pump 2. Cary explained the findings of PNNL. The PNNL suggested not running pump 3, so pump 3 is now in a standby mode. Cary stated that the acoustic tests ran to determine cavitation or vortexing was inconclusive. The PNNL is going to run the acoustic tests again. There was discussion on the sump problems and tests at Ice Harbor. Larry Swenson stated that he thought it best to take a careful set of vibration measurements as close to the top bearing (on the pump housing), or as close to the bottom shaft bearing as possible with different pump combinations running. There was more discussion on the sumps.