ANADROMOUS FISH EVALUATION PROGRAM
Fish Facility Design Review Work Group
Minutes
October 23 and 24, 2002

ATTENDEES:

Name	Organization
Martin Ahmann	U.S. Army Corps of Engineers (Corps)
Gordon Axel	National Marine Fisheries Service (NMFS)]
Linda Carter	Corps
Kevin Crum	Corps
Rick Emmert	Corps
Brad Eppard	NMFS
John Ferguson	NMFS Seattle
Kim Fodrea	Bonneville Power Association (BPA) (via telephone)
Mike Gessel	NMFS
Kenneth Ham	Battelle Pacific Northwest Laboratory (Battelle)
Bill Hevlin	NMFS
Fred Higginbotham	Corps
Eric Hockersmith	NMFS
Dave Hurson	Corps
Gary Johnson	Battelle
Rebecca Kalamasz	Corps
Dan Katz	Corps
Tom Lorz	Columbia River Inter-Tribal Fisheries Commission (CRITFC)
Mike Mason	Corps
Sean Milligan	Corps
Russell Moursund	Battelle
Steve Pettit	Idaho Department of Fish and Game (IDFG) (via telephone)
Chris Pinney	Corps
Cary Rahn	Corps
Steve Rainey	NMFS
Lynn Reese	Corps
Tom Ruehle	NMFS
Ann Setter	Oregon Department of Fish and Wildlife (ODFW)
Marvin Shutters	Corps
Mark Smith	Corps
Larry Swenson	NMFS (via telephone)
Ron White	Corps
Tim Wik	Corps
Rod Woodin	Washington Department of Fish and Wildlife (WDFW)
Tonia Elsey	Corps

The Fish Facility Design Review Work Group (FFDRWG) meeting was held in the Harvest Room on October 23 and the Castle Room on October 24, 2002, at the U.S. Army Corps of Engineers (Corps), Walla Walla District (District), 201 North Third Avenue, Walla Walla, Washington. Marvin Shutters organized 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 (handout 1) and stated an agenda item for the BPA analysis was added. Bill Hevlin stated that it was more aptly named, BPA cost efficiency proposals. January 22 and 23, 2003, and April 23 and 24, 2003 were proposed for the next FFDRWG meetings. It was decided to begin the first day of the January meeting at 12 p.m.

1. ICE HARBOR LOCK AND DAM (ICE HARBOR) TURBINE REPAIR. Martin Ahmann stated that unit 2 turbine is still on schedule for replacement in fiscal year (FY) 2005. The biddability, constructibility, operability, and environmental (BCOE) review for the contract on the single unit 2 turbine is scheduled for an April-May time period next spring. Martin stated, the Turbine Survival Program (TSP) team is pursuing support from the Department of Energy (DOE) for biological field-testing of the existing unit, and evaluation of the new runner design through model testing at the U.S. Corps of Engineers, Engineering Research Development Center (ERDC) [formerly known as the U.S. Corps of Engineers, Waterways Experiment Station (WES)]. The Columbia River Fish Mitigation Program (CRMFP) dollars are limited with respect to the turbine research at Ice Harbor. The DOE has made a commitment to support the turbine research and testing at Ice Harbor. The DOE will provide funds for research and development, but will not assist with any of the repair or replacement costs at Ice Harbor. Martin stated his team plans to conduct some baseline direct turbine survival testing on the existing operations next spring or summer.

Steve Rainey stated the minimum gap runner (MGR) was tested through the TSP and did not show any reduction of injury or mortality of the fish sliding along the hub runner gap. He stated the highest efficiency would be the highest survival. Martin stated there were many things that could be considered in the designing of the turbine runner. There was discussion on the different things that needed to be considered in the design.

Steve Rainey asked if the alternate hub configuration would allow the runner to reduce the pressure differences. Martin stated that longer blades would spread the pressure change out over a longer area and would minimize the spike. He stated the specifications written for the turbine design have blade length requirements included. There was discussion on the design of the turbine. Marvin Shutters stated that if the money from DOE were granted, a study plan would be developed and distributed to the members of FFDRWG to review.

Rod Woodin asked if unit 2 is shut down periodically to pump the oil out. Dave Hurson stated that pumping the oil out would be extremely difficult. There was discussion on the oil leak in unit 2 and continued discussion on the MGR at Ice Harbor.

2. MCNARY LOCK AND DAM (MCNARY) MODERNIZATION PLAN. Kevin Crum distributed handout 2. Kevin stated that the handout is very similar to past handouts. On the handout, the milestones are marked with a line through them to show as being complete. Kevin reminded everyone in the FFDRWG meeting that the McNary Modernization Program is not funded under the CRFMP. The McNary Modernization Program is directly funded by BPA. This program will be funded through the prototype installation (approximately 6 years). Kevin stated that a contract was awarded in June to four contractors for a best value contract. The four contractors will be competing against each other to produce the best turbine design. The criteria for the design is based on the following items in the order given:

- Fish considerations
- Performance, hydraulic, and power output
- Price
- Past performance of the contractor

Kevin stated the contractors are in the middle of their design efforts, and some submittals are being received. Each contractor will design and build a model scale runner. Each runner will be shipped to an independent laboratory in Europe and tested. These laboratory tests are scheduled for March 2003. After the independent laboratory has completed all the necessary tests, the runner will be shipped to WES, and a series of biological tests will be conducted. Kevin stated that the WES work and all the related gatewell, vertical barrier screens (VBS), extended submerged bypass screen (ESBS), *etc.,* are being coordinated by Martin Ahmann. Mark Smith will be coordinating the McNary biological testing (needed for baseline data) and confirmation. Kevin stated in March 2004 one contractor would be selected to proceed into prototype design. The prototype would be installed at McNary in March 2006. After installation is complete, there will be biological and turbine survival tests conducted.

Rod Woodin asked where the off ramps for the turbine prototypes were. Kevin stated the off ramps could be after the independent laboratory testing, WES testing, or even after the prototype is installed and tested.

Dave Hurson asked if the project management plan included a screen maintenance facility for McNary. Kevin stated that a facility was not currently part of the project management plan. Dave stated if the new prototype requires cleaners for the VBS it would force the project into a year around maintenance program for the screens. Kevin stated that there is a facility planned for painting and sandblasting all the parts that come out of the old turbine unit (to eliminate any lead paint). This facility should be large enough to use for cleaning the VBS.

There was discussion on the McNary Modernization Plan and the possible need for a facility for year around cleaning and maintenance of the screens at McNary.

Martin Ahmann stated the new criteria for screen design is 1.7-millimeter sized openings as opposed to a 1/8-inch opening. His team is working towards accommodating that new criteria through the McNary Modernization Program. His team is looking at a design for a possible partial installation of fixed VBS screens. Martin described other possible screen designs that his team has observed. The team had a meeting with screen experts from WDFW and received some good advice on screen design. There was discussion on the different screen designs. Martin stated there is a trip to WES planned for the end of November.

Mark Smith stated that his part of the McNary Modernization Plan team would conduct hydraulic tests with screens and scaling tests with undetermined fish. The team is looking at the McNary Modernization Plan to provide some telemetry equipment that will add to the spill study by collecting McNary baseline data on survival, route of passage, spill efficiency, and baseline fish guidance efficiency (FGE) next year. There was discussion on the tests that have been conducted and the different tests that need to be conducted. Martin Ahmann stated the FY 03 testing would focus on the debris and descaling issues. Dave Hurson stated that none of the tests should be conducted on summer fish only. The tests need to be conducted on spring fish too. He stated it is very critical that tests are conducted on both fish seasons. Discussion continued. Martin Ahmann showed a sample of some prospective plastic screen material.

3. SNAKE RIVER AND MCNARY ACTION PLAN. Rebecca Kalamasz distributed handout 3 (need handout). Rebecca stated that this project would be used for developing an action plan for the Snake River and McNary projects. It ties together all the programs that the Corps has been working on for the last few years. The major objective is to get to the performance measures. This plan will also enable the Corps to obtain more effective uses of the resources. The team plans to balance fish programs with cost, water quality, and power. Rod Woodin asked how this action plan tracks with the Lower Snake Feasibility Assessment. Rebecca stated that this action plan would absorb the Lower Snake Feasibility Assessment. There was discussion on the action plan. Rebecca stated this action plan would parallel the biological opinion (BI-OP) and the Lower Snake Feasibility Assessment. Dave Hurson stated this document should spell out the steps that need to be taken to arrive at decision-making points for each project. It will pull together all the previously gathered information. There was discussion on the Snake River and McNary Action Plan. Rebecca stated the team would identify and define the base conditions and range that are presently being worked under. The team would then define future configurations for each of the projects. The team will develop criteria, conduct a screening-type evaluation, and focus on those projects that have the greatest potential for system survival. The team plans to have a draft report of their findings for the Systems Configuration Team (SCT) by next fiscal year. The report will be written on the whole Snake River system broken down by each project.

Mark Smith asked if the March 2003 draft report would include the lower river projects (Portland District). Rebecca stated that Portland District would provide the team with their latest information to include in the configuration. Lynn Reese stated Portland District indicated they would work with the Walla Walla District to incorporate the downstream projects into the spreadsheet model.

Rebecca Kalamasz stated the first milestone would be to obtain the information to facilitate the SCT process. Rebecca asked for input on agency participation and coordination. Bill Hevlin stated monthly meetings with the agencies would be beneficial. He stated each participating agency should receive the information a week or two in advance to review so the monthly meeting could be more productive. Steve Rainey stated there was going to be a need for technical and biological components. Rebecca stated in order to have anything ready to present to SCT in March it would take more than monthly meetings. She stated it would be wiser to have weekly conference calls and/or meetings. There was discussion on the agency participation commitment and the project as a whole.

4. THE BPA COST ANALYSIS. Kevin Crum stated BPA has announced (through the Division office) that they are having financial problems in the 2006 rate case. Kevin stated the Corps would be looking for different things to implement within the rate case that would help BPA. The BPA is looking for ideas in the rate case that are implementable and have either a neutral or better fish effect.

The District has assigned a team to work with National Oceanic and Atmospheric Administration (NOAA) [previously known as National Marine Fisheries Service (NMFS)], fish and wildlife services, Bureau of Reclamation (BOR), and BPA. The team is being split into three smaller groups: Flow Team, Spill Team, and Configuration Idea Team. Kevin stated he would be in charge of the Configuration Idea Team. His team brainstormed several ideas that could be implemented and save money. The ideas are to combine the removable spillway weir (RSW) and Behavioral Guidance System (BGS) at both Ice Harbor and Lower Monumental Lock and Dam (Lower Monumental), and Portland District will look at guidance devices at The Dalles Lock and Dam (The Dalles). Postponing the spill test at John Day Lock and Dam (John Day) until after 2006 was also brought to the table for discussion. Currently, there is a transport study being conducted at Ice Harbor. Kevin stated the team ran these ideas through their own system passage analysis tool and looked at the cost, gas, power, potential power benefit, and baseline data showed no negative effects on fish.

Kevin distributed handout 4 and explained how the team determined what the biological effects would be, what the costs would be, what an implementation schedule would look like, and what the risk and uncertainties are. Kevin stated that there is not enough survival data in the spillway and the RSW at Lower Granite Lock and Dam (Lower Granite) to warrant the expediting of the RSW at Ice Harbor. The BPA stated they wanted to go forward with everything already set up in the CRFMP or BI-OP, but they could not pay for them. The question is, can the CRFMP absorb the costs in accelerating any of the ideas. The BPA could possibly handle some shared costs, as

opposed to the whole costs for implementation of the different fish improvement ideas. Kevin stated there was money left from the Lower Granite RSW work to use to look at other sites for RSW implementation. The Corps has committed to using those remaining funds for Ice Harbor RSW research for as long as it lasts. The Corps will need additional funds approximately the second quarter of this FY to continue. There should be a decision made by December on from where the additional funds will come. If the decision is made that there would be no additional funding, then the work would cease. Kevin stated that the schedule was to implement the RSW first and follow up the next year with the BGS. The issues with transport, outfall pipe relocation, and spillway survival have left too many questions to be answered at Lower Monumental to consider RSW and BGS implementation ahead of Ice Harbor.

Mike Mason stated that SCT was advised by the executives to go to the regional forum. The SCT meeting was the first step in that direction. They were also told to use the money that was already programmed to protect the schedule and to start moving forward. Rod Woodin stated he had a problem with the whole discussion of singling out one project to fast track when the FFDRWG members just finished discussing the action plan of using a multi-year process to identify implementation processes in the projects as a whole. There was discussion on the different ideas that could be implemented to produce an improved or neutral impact on fish survival and be a benefit to BPA.

Kevin stated the 2002-2003 data suggests spillway survival might be lower than the 1998 survival level. The Corps believes if the higher mortality is tied to higher spill levels and an RSW could produce just as many fish over the spillway at a higher survival rate then it all makes sense. If it is tied to predation or some other factor, then the RSW does not make sense. There was discussion on the RSW and continued discussion on ideas for improved or neutral impact on fish survival. Kevin asked if the study plan stays on the path of Lower Monumental and Ice Harbor spillway survival, what would it look like if an RSW were implemented at Ice Harbor. Would spillway survival be changed or altered? Do the answers needed at Ice Harbor influence next year's testing at Lower Granite? He stated that FFDRWG as a whole needs to attempt to set up a program to address and research the risks in order to be ahead of problems implementing RSW's when there could be a survival problem. Kevin stated his team would like to have a meeting and lay out what the issues are. They would like to take 6 months of this FY to do more conceptual feasibility studies at Ice Harbor instead of just transferring the technology from Lower Granite.

Rod Woodin stated it would take a lot to prove to him that the focus should not be more on Lower Monumental for RSW implementation instead of Ice Harbor. Discussion continued. Kevin suggested combining the action plan and fast track meetings. Kevin stated that the Corps is funded next year to begin looking at other sites.

Ann Setter stated both Ice Harbor and Lower Monumental should be looked at equally for potential RSW and BGS implementation. Dave Hurson stated in order to make a decision on RSW and BGS implementation the Corps team needs to know what the agencies want to see. Ann Setter stated that a half-page report that lays out why

the Corps decided to go one way or the other would be a good start. Marvin Shutters suggested the Configuration Idea Team write a short summary report of their findings so far and distribute it to the rest of FFDRWG for comment. Rod Woodin stated he could see the priority on obtaining additional information at Ice Harbor to resolve the uncertainties and then put the money into the design if it makes sense.

Dave Hurson stated that the information needed to do RSW and BGS construction will not be available until more spillway research is conducted. He stated it did not make sense to change the original direction of study planned if the whole reason for constructing an RSW and BGS at Ice Harbor is so BPA can make money, particularly when BPA is not even willing to come up with the dollars to do the construction. Kevin stated that the available funds should be used until they run out and then figure out what to do about additional funding. Rebecca Kalamasz stated the decision point for additional funds would be in March.

Kim Fodrea stated that all she asked at the SCT meeting was that the Corps and other agencies start collecting thoughts on how to evaluate the alternatives. She did not ask for a decision to approve or reject. She stated that what she heard from the discussion was that everyone is ready to reject. Yesterday, it sounded like the Corps and agencies would be willing to talk about how to evaluate the alternatives.

Steve Rainey stated that the conclusion was it would take longer than 2 months to get everyone up to speed on the available information, meet, and identify the work that needs to be done. Rebecca Kalamasz stated that when the study plan for the RSW was discussed it was decided to first discover the kind of information needed for the RSW work next year that would help lead to decisions at future projects. Tomorrow, FFDRWG will discuss studies at Ice Harbor and Lower Monumental and what potential studies would be needed for future decisions associated with RSW at those sites. Marvin Shutters stated that the negative issue was more about fast tracking to design, not the need for information.

Kim Fodrea stated that her assumptions are that the Corps has funding for 2 months and then would need a decision whether to accelerate the alternative schedule or not. Mike Mason stated the executive group has told them to run on an accelerated path and protect the 2005 schedule. The Corps has money that was intended to spread over the whole year to look at other projects. That money will now be used to focus on the first quarter. The Corps will have to take a look in early second quarter to see what additional funds are going to be needed and how they can be obtained.

Marvin Shutters stated the Configuration Idea Team would supply information on how the different alternatives were analyzed to obtain the list of projects and distribute it to the FFDRWG members. Kevin Crum asked if the information was to be for all the alternatives or just the ones currently on the table. It was decided that the information should only be for the alternatives currently on the table.

5. LOWER GRANITE RSW. Kevin Crum stated, based on the direction of the July study, the Corps had made a commitment to look at removing the surface bypass collector (SBC). The Corps is close to having a contract developed to have the SBC removed. The estimated cost to remove the SBC is $1.5 million. At the same time, the team is looking at what other things could be taken out of the program or if the monitoring program could be cut back to help pay for that removal. The budget for Lower Granite surface collection RSW has not been adjusted. He stated that if the Corps is not in a position by February to have a contract ready then something else should be considered.

6. LOWER GRANITE RSW 2003 OBJECTIVES – STUDY PLAN. Tim Wik stated he did not have any 2003 objectives or a study plan. Tim asked to set a planning oriented meeting for sometime in December. It was decided to hold the meeting on December 10, 2002. Tim stated he would have some additional information from the past year. He is hoping to discuss the study plan and firm up the operations. Tim stated today he wanted to present some operations alternatives for the FFDRWG group to think about and discuss. Tim stated the information obtained this past year seems to point towards an RSW plus a level of training spill passes the same or greater number of fish than a 12 hour BI-OP spill. He asked if FFDRWG felt it was necessary to repeat a BI-OP spill test condition next year, or if they thought the information obtained from this year's test was sufficient enough to drop that test from the schedule. Dave Hurson stated if the guidance devices are out there then a BI-OP spill should be done and asked if the occlusion devices have the same impact on RSW passage as they do on BI-OP spill.

Steve Rainey stated an important issue is that the previous tests did not produce very good RSW versus eight (could not hear). Dave Hurson stated the question that needs to be asked is: can we at least meet the BI-OP spill condition by using the RSW at either full level spill. If we know we can meet or exceed the BI-OP spill condition, then we do not need to include the BI-OP condition. If we have to do that comparison, then one objective is how does the RSW perform compared to the base condition, and which is the preferred operation of the RSW. Tim Wik asked if an objective of 2003 should be; does the RSW work as well as BI-OP spill or have we answered that question. Gary Johnson stated there are possibly five scenarios in the data. There was discussion on the objectives for 2003 and last year's testing. Lynn Reese stated he liked the idea of testing the RSW as a stand-alone spill and a stand-alone BI-OP spill for comparison. Discussion continued.

Marvin Shutters stated the objectives that he has heard are: is an RSW operation better than the gas cap at night spill, is the RSW operating in the spillway better than the spillway by itself, and how much training spill is necessary which is tied in with juvenile fish survival and tailrace egress. Discussion continued on the 2003 objectives.

Kenneth Ham stated when there are three treatments instead of two there is less statistical power available. Gary Johnson stated the treatments were 2 days long. One-day treatments would be more efficient. Tim Wik stated that the treatments were 2 days

long so the radio-tagged fish could enter the forebay and pass within a single treatment. Discussion continued.

Tim Wik stated he liked the idea of gas cap spill versus the RSW, plus a fairly low training spill. Then, if a time period becomes available within the season, there is already a plan in place for bumping the training spill up, supplying another condition to evaluate. Discussion continued.

Gary Johnson stated one of the objectives should be to provide baseline information on passage efficiency with the RSW. Rebecca Kalamasz asked if any of the tests observed adult fish passage. Tim Wik stated there were no adult fish passage objectives in place at this time. Marvin Shutters stated the RSW was monitored for adult fish fallback in 2002.

7. LITTLE GOOSE LOCK AND DAM (LITTLE GOOSE) FAST TRACK DISSOLVED GAS ABATEMENT STUDY (DGAS). Sean Milligan distributed handout 5. The handout showed plots that are being developed at WES on the general model. Sean explained that the plots are based on the video tracking system (VTS). Sean stated the data produced by the VTS would enable his team to draw velocity vectors that show the flow patterns and the velocity magnitudes. The team has observed several different flow conditions (powerhouse only, spill only, *etc.*) and is developing plots for the existing baseline conditions with attached end bay deflectors. The team will be able to identify changes in the flow patterns that the end bay deflectors create. In addition to the VTS information, the team will produce some more traditional data collection techniques (videotapes of dye injection and surface confetti). The team is planning a trip with agency representatives to WES the first week of November. The purpose of the trip is to observe the proposed recommended end bay deflector design. The team is hoping to confirm the Little Goose proposed end bay deflector design and elevations. There was discussion on the effects of the proposed end bay deflector design in the general model.

Steve Rainey stated that one objective the team hopes to obtain from the research is a sense of what kind of juvenile fish delay and/or mortality potential will occur if an eddy is created by large spills.

Sean stated that once the modeling for the end bay deflectors is finished the team would look at the potential for alternate spill patterns and the possibility of adding a divider wall to help control the eddy problems at Little Goose. The team will look at navigation issues to make sure there will be no impacts to navigation by changing flow patterns in the tailrace. The team will also look for any potential for stilling basin erosion or disposition. Plans and specifications were to be completed this winter with construction next spring. Due to SCT prioritization on funding, the design work and construction of the end bay deflectors has been delayed at least 1 year. The plan now is to complete the modeling for the end bay deflector and wrap up all the issues pertaining to the deflectors. The team will complete the VTS work and observe the dye and confetti patterns. The team will take velocity transect readings along the line

between the spillway and powerhouse to determine how much powerhouse entrainment is created with existing spill patterns. There was discussion on the end bay deflectors and possible need for a divider wall.

Rick Emmert stated the rule used to be that the states would respond to water quality items within 60 days of receiving the Environmental Assessment (EA) and notification that construction was going to be done. The rules have changed; the states now have up to 1 year to comment on water quality items. The Corps has to apply for water quality certification at least 1 year before construction can begin. Steve Rainey asked when design and procurement would have to be complete in order to have the end bay deflector installed by spring of 2004. Rick Emmert stated the team would need to begin right now for installation in spring of 2004. The 1-year delay set by SCT brings installation to the spring of 2005.

8. MCNARY EGRESS. Marvin Shutters stated his team is planning one more trip (to where?) to observe some changes in spill patterns in early December. Rick Emmert stated everything else is on hold. Rick stated his team was attempting to correct an adverse eddy condition in the tailrace near the north fish ladder entrance. Those attempts have been put on the back burner. The BI-OP asks to have the need for divider walls looked at for all the projects. Rick stated the team wanted to complete a technical report and conduct additional modeling to look at divider walls at McNary. Since there is no funding available for this project, the team will continue with spill pattern alternatives to prepare for this spring's operation.

Marvin Shutters stated Brad Eppard had released fish for the Ice Harbor survival telemetry study. Those fish went down to McNary and passed over the spillway, which in turn, provided information on which spillbay the fish passed through. The receivers in the tailrace provided tailrace egress and movement pattern data. Brad Eppard stated the tailrace egress information would be available next month. There was discussion on tailrace egress and spill patterns at McNary. Ann Setter asked if a decision on the divider wall at McNary had been made. Marvin stated the divider wall decision was on hold. Ann asked if the trip to (where?) would provide enough information to throw the divider wall out completely. Marvin stated they were only going to look at spill patterns for 2003 operation. Discussion continued on the egress study at McNary. Rick Emmert stated that there was gearbox failure on one of the new hoists at McNary. The hoists are still under warranty so the contractor is replacing all the gearboxes on all the hoists because it was discovered that they were not within specifications. The replacements will be finished and installed for operations by mid-February.

9. RESEARCH PLAN 2003 FOR LOWER MONUMENTAL, ICE HARBOR, AND MCNARY. Mark Smith distributed handouts 6a and 6b. Mark stated there have been many questions regarding spill survival at Ice Harbor. His team has decided to attack Lower Monumental and Ice Harbor this next year with a study of project survival and spill at the projects. Mark stated handout 6a displays the studies that can or should be done at Lower Monumental, Ice Harbor, and McNary during this next year. Mark explained the spreadsheet. The top bar of the spreadsheet lists the information

needed. The left side of the spreadsheet lists the studies that the team felt were necessary to conduct. The spreadsheet breaks down each study and the data it provides for each project (*e.g.,* the telemetry study at Lower Monumental would provide data on project, spill, and system survival, as well as spill efficiency). Mark stated the goal today was to determine what the needs are for the next year's study, what studies should be prioritized, and what information will be gained from the studies. There was discussion on studies that have been conducted in the past and studies that need to be conducted. Mark stated they want to repeat last year's study on existing spill and look at egress, but would not conduct a detailed egress model study.

Brad Eppard summarized the spillway passage survival tests done at Ice Harbor in 2002 (see handout 6b). Brad stated the fish were released directly in front of the spillbays. Last year's study was conducted to estimate spill survival and in order to do that the fish needed to go up through the spill. The fish released were both radio and Passive Integrated Transponder- (PIT) tagged fish. The fish were released at the same time, in the same bay, twice a day. There was discussion on the graphs in handout 6b. Bill Hevlin asked where the controlled release was done. Brad stated they released the radio and PIT-tagged fish in the tailrace upstream from the barge cells. Discussion continued on the graphs and the results of the 2002 passage survival tests done at Ice Harbor. Rod Woodin asked what the data points represented. Brad stated the data points represented survival estimates at each release. He stated it is all the environmental information put to a graph to represent survival estimates with flow. Ann Setter asked if they looked at percent spill of total river flow versus survival. Brad stated they did look at that in 2000 but have not for 2002. He stated he would check that out for 2002.

Mark Smith asked about the bypass turbine survival from Ice Harbor release to Strawberry Island. Gordon Axel stated that they sent numbers to Steve Smith, and he ran a true bypass survival estimate of the fish that were released into the forebay at Ice Harbor and passed through the bypass system. The survival estimate showed a 99.6-percent survival of fish passed through the juvenile bypass system (JBS). There was discussion on the different survival rates from the Ice Harbor release to Strawberry Island. Bill Hevlin asked if there was a breakdown of volume per spillbay. Brad stated he had the data available to determine spillbay volume, but had not included it in the graphs. Discussion continued on the spillway passage survival slides.

John Ferguson asked what was the best alternative for 2003 operation. Brad Eppard stated reduced spill would be the most efficient alternative. Mark Smith asked what the agencies wanted to see tested at Ice Harbor. Rebecca Kalamasz stated they should identify what they needed to know first. Steve Rainey stated the question of whether passage survival problems were mechanical or predation needed answered. Rod Woodin stated that it was jumping the gun to assume there is even a survival problem. He stated that Brad's survival report displays very good data for survival, and leaves no basis for having a survival problem. There was discussion on the kind of data that was needed from Ice Harbor spillway to determine survival.

John Ferguson stated the biologists and engineers should come together, look at the conditions the data points represent in more detail, and attempt to sort out some kind of hypothesis. Brad stated that comparing slide 14 and 24, and 13 and 23 would show the survival and (could not hear) elevation (see handout 6b). John stated there are three choices for what to do next: repeat the experiments and attempt to obtain a broader database, jump to a lower volume, or attempt to get at the mechanisms. There was discussion on the survival rates of previous years. Mark Smith proposed to have the agencies and his team take some time to digest the information from Brad Eppard's spillway passage survival report, schedule a special FFDRWG meeting to outline what needs to be done, and coordinate it all with a trip to WES. There was discussion on what tests need to be run at Ice Harbor.

Rod Woodin recommended dropping the PIT-tag testing because of the lack of precision on the previous PIT-tag estimates and focusing on the radio-tag tests. Brad Eppard asked Rod what acceptable precision would be. Rod stated it needed to be brought down within a 1- or 2-percent confidence level. There was discussion on the PIT-tag tests. Eric Hockersmith stated they could conduct some high Z-type direct effect conditions at Ice Harbor. He stated they would need to be conducted early, middle, and late in the season where there are different tailwater conditions and elevations. He stated the three estimates of survival from Lower Monumental to McNary, prior to the flip lips were lower than the subsequent three after the flip lips. There was discussion on the different studies that could be conducted at WES.

Tom Ruehle asked if there was sufficient time for design and funding available for full flow PIT-tag testing at Ice Harbor. It was stated by many that it was possible, but no one was real sure of funding. There was discussion on the full flow PIT-tag testing and whether there was funding or not.

Mark Smith stated he would develop a draft study plan from the information on handout 6a and send it to the members of FFDRWG. There was discussion on the study plan.

10. <u>HIGH-VELOCITY SEPARATOR HIGH-DENSITY TESTS</u>. Fred Higginbotham distributed handout 7. Marvin Shutters stated there was some discussion (May FFDRWG meeting at Lower Granite) that the high-velocity separator would be a feature of interest, but it had never been tested with anything other than low densities of fish. It was determined that the high-velocity separator should be tested with a high density of fish before it was incorporated into a new system. The Corps developed a proposal to test for high density without altering project operation. Mike Gessel stated the only way to conduct the test would be to transport a high density of fish to release in order to obtain the high-density numbers needed. At the last review, questions arose whether this was the best approach. Some of the questions raised were: would other studies be impacted, is the timing right, or could the high-density test be postponed and could Dan Katz's separator design at Lower Monumental be used instead.

Ann Setter stated the issue for her was that the agencies wanted the study so the high-density flume could be built at Lower Granite. She stated the fish used for testing need to be obtained from a more appropriate source. It is not appropriate to use fish that have passed through the hydraulic system. She stated the fish needed to come from a facility where they are raised or collected before the fish go through passage stress. There was discussion on the fish needed and the high-density testing.

Mike Gessel stated one of the reasons for considering Lower Monumental was because Dan Katz's new design did not require removal of the system presently there. The new design would be positioned along side of the old system, and it appeared that both systems could be used. If the new high-velocity flume did not work appropriately, the flow could be shifted back to the old system. Mike stated maybe pursuing a new design at Lower Granite like the one at Lower Monumental is the answer. It was stated by several members of FFDRWG that attempting a side-by-side design at Lower Granite would involve extremely large modifications. There was discussion on the high-velocity separator testing, the best way to release fish, and the possible stress on fish.

Marvin Shutters stated the Corps will write a revised proposal to conduct a gatewell dip of fish at Lower Granite, truck them at low densities to Ice Harbor, acclimate them well and let them recover, then release them into the high-velocity separator. This would enable the team to obtain the data needed in time to start plans and specifications by 2004. Discussion continued on the high-velocity separator testing.

Fred Higginbotham asked what this high density of fish would do to the down stream studies. There was discussion on what to do with the fish. The plan was to hold the fish up for awhile, let them get re-oriented, and release them back into the river. The general consensus of FFDRWG was to not worry about the fish, and that they can be absorbed.

11. EMERGENCY AUXILIARY WATER SUPPLY AT LITTLE GOOSE. Cary Rahn stated that SCT has decided not to fund the construction of the Emergency Auxiliary Water Supply for Little Goose. The construction has been put on hold for 1 year pending results of the numerical modeling. The numeric model study was delayed 2 months. The final report should be available in mid-November. Cary stated, as part of the data collection study, his team constructed simulation frames to install in the adult fishway channel. It is a portable system that can be used anywhere to obtain precise measurement flows. Cary stated that the construction for the physical pumping plant of the auxiliary water supply for Little Goose (if deemed necessary) has been postponed for at least 1 year. He stated if the model works for Lower Monumental, the team would forego any design for a physical pumping plant at that project. There was discussion on the numerical modeling at Little Goose and Lower Monumental. Marvin Shutters asked if the scope of the report was just for the construction and ground truthing of the model or if it would be an analysis of making criteria under various conditions. Cary stated the report is supposed to supply some proposed operational changes that will get close or within criteria based on the numerical model. Discussion continued on the numerical modeling at Little Goose and Lower Monumental.

12. ICE HARBOR EMERGENCY AUXILIARY WATER SUPPLY – SUMP MODEL TESTING. Cary Rahn distributed handout 8 and stated the team is focusing on the sump modeling. He stated that NEC (what is NEC) has proposed to use mitered straight edges in the construction of the formed inlet instead of curved, converging cone shapes. The physical model consisted of filling in the back wall, tapering the sidewalls in toward the mitered back wall, and filling in the roof on both the front and back side of the intake valve. When these modifications were modeled, instrumentation indicated there was no vortexing, and no pre-swirl. Velocity distribution within the column was not within plus or minus 10 percent (87 percent on the backside and 112 percent on the front side of the intake valve). Cary stated the team has determined that the velocity distribution problems are not sump related. The intake valve rather than being a curved or bell shaped transition, is a straight edge that ties into the pump column at a hard angle. Instead of the transition allowing water to flow smoothly into the vertical path, the water is actually being thrown into the middle of the pump column and causing turbulence and distribution problems until the water straightens out. The modeling indicates that the velocity distribution problems are associated with the pump design not the sump conditions.

Cary Rahn stated the team thought they had a solution to the initial pump modeling. Northwest Hydraulic Consultants (NHC) performed approximately 30 different model variations and could never get the sump within hydraulic institute (HI) standards. The existing sump with no modifications has type four vortexes prevalent in the sump at all times. Cary stated at 250 cubic feet per second (cfs) flow the existing sump is not HI compliant, and at 400 cfs the sump has better velocity distribution, but they still have the same amount of vortex activity. Once the sump model was tested, all vortexing went away with no pre-swirl issues, but there were still some velocity distribution problems. There was discussion on the sump and pump designs and the problems of scrapping the construction altogether.

Rod Woodin asked if the sump modifications (if necessary) could be made of fabricated steel instead of concrete. The fabricated steel could be installed under water using divers. Cary Rahn stated there had been discussions of fabricating it in pieces and welding it in place. The only concern with that would be the small differences in the sump and the kind of (could not understand) that could be built for a steel structure that would allow site adjustments. Larry Swenson agreed with Rod Woodin. He stated there has to be a way to install fabricated steel that would greatly simplify the construction and create less expense. There was discussion on the possible sump modifications.

Marvin Shutters stated that Cary would have more model information at the next FFDRWG meeting. His team will continue to run model tests to obtain ways to make the pumps more HI compliant. Dave Hurson suggested adding some instrumentation to obtain baseline information on the pumps.

13. ICE HARBOR AND LOWER GRANITE ADULT PIT. Marvin Shutters stated he distributed (via electronic mail) the (could not understand) set of plans and specifications approximately 2 weeks ago. Cary Rahn stated he was expecting the final plans and specifications at any time. He stated there were concerns (at the last FFDRWG meeting) about what was going to be done for the antennas that would not impact ladder hydraulics. Cary distributed handout 9. He stated the handout showed an isometric view of what each modified weir will look like. The orifice antenna slots are shown on the right of the handout. The team is creating pole height channels in the weir where the orifice antennas can be slid into instead of being cast in place in the floor. There will be fiberglass panels that drop in on the upstream and downstream side of the orifice. There was discussion on the installation of the antennas.

Cary Rahn stated the four weirs will be removed, bring in pre-cast panels, and should cut down all in-ladder activities to approximately 2 weeks of in-water work. He stated construction would begin at Lower Granite with that ladder being out for the month of January. Ice Harbor north shore ladder has 2 months of work because of the EAWS (need to know what this acronym is) work. The south shore ladder at Ice Harbor will be down for 2 weeks. There was discussion on the construction.

14. LOWER MONUMENTAL JUVENILE FISH FACILITY (JFF) IMPROVEMENTS. Dan Katz distributed handout 10. Dan stated the handout showed a composite view of Lower Monumental. Dan explained how the JFF is currently set up. Dan stated the main goal is to get the fish to a certain point at a lower velocity. He stated there are some special problems at Lower Monumental as far as visibility and coordination between the dewatering units and the raceway. He stated his team could accomplish getting the fish out to the barge loading area at approximately one half of the velocity this year. He explained what could be done to the existing JFF to accomplish the change in velocity. There was discussion on the existing JFF and the proposed changes. Rebecca Kalamasz stated a biological impact evaluation should not have to be done because the change in the JFF would be a much less aggressive condition for the fish. Discussion continued.

15. LOWER MONUMENTAL SPILLWAY REPAIR AND DEFLECTOR CONSTRUCTION. Dan Katz distributed handout 11. Dan stated the concrete will be placed November 15 through 29, and the floor repair in the stilling basin should be complete by December. The deflectors will be complete by mid February 2003. Dan explained how the drilling is being done. The holes are being drilled, rebar is placed immediately in the holes, and then the grout is pumped in. Rod Woodin asked if there was any additional steel tied between the rebar shafts. Dan stated that there was no steel between the shafts. The original design called for the rebar to be j-hooked on top to add some adhesion for the concrete. The contractor changed the original design from j-hooks to a plate on top of the rebar. Divers are installing these plates. There was discussion on how the spillway is being repaired.

Mark Smith stated the Corps has been monitoring the adult fish in the area. When drilling first started, there were numerous fish in the area. Now, the drilling is being done only at night.

Bill Hevlin suggested that water quality should be monitored and published in a report for the next time this type of work has to be done. There was discussion on the pumping of the concrete.

Dave Hurson stated that this project needs to be as close to complete as possible by February 1, 2003, in order to have it placed in the fish passage plan for 2003. Dan Katz stated the spill pattern should be very straight forward. It would be matter of adjusting the stops one way or another to make sure the spill off the end bays will be equivalent to the spill in the center bays. There was discussion on developing new spill patterns for Lower Monumental. It was determined that the first trip to WES should be used to determine powerhouse-to-spill ratios and turbine unit operations. There was discussion on the trip to WES.

Bill Hurson stated that when he went to WES last year, Lynn Reese had a series of spreadsheets depicting a schematic plan of how all the testing that was needed would be done. He asked if that could be done for this trip to WES to make the model testing run smoother. Dan Katz stated that he would work on spreadsheets and have them ready for the upcoming trip to WES.

Dan Katz stated the remaining work beyond the current (could not understand) is the juvenile outfall relocation divider wall and the development of a technical report that looks at combining alternatives of different divider wall lengths and juvenile outfall locations. There was discussion on the divider wall.