

ANADROMOUS FISH EVALUATION PROGRAM
Fish Facility Design Review Work Group
Minutes
February 25 and 26, 2004

ATTENDEES:

<u>Name</u>	<u>Organization</u>
Martin Ahmann	U.S. Army Corps of Engineers (Corps)
Ron Boyce	Oregon Department of Fish and Wildlife (ODFW)
Jim Cain	Corps
Randy Chong	Corps
Kevin Crum	Corps
Scott Dunmire	Corps
Rick Emmert	Corps
Brad Eby	Corps – McNary Lock and Dam (McNary) (via telephone)
Kim Fodrea	Bonneville Power Administration (BPA)
Derek Fryer	Corps
Mike Gessel	National Oceanic and Atmospheric Association (NOAA)
Mike Halter	Corps – Lower Granite Lock and Dam (Lower Granite)
Kenneth Ham	Battelle Pacific Northwest Laboratory (Battelle)
Bill Hevlin	NOAA
Fred Higginbotham	Corps
Eric Hockersmith	NOAA
Bob Hollenbeck	Corps
Dave Hurson	Corps
Rebecca Kalamasz	Corps
Russ Kiefer	Idaho Department of Fish and Wildlife (IDFW) (via telephone)
Nic Lane	BPA
Ryan Laughery	Corps
Jon Lomeland	Corps
Tom Lorz	Columbia River Inter-Tribal Fisheries Commission (CRITFC)
Art Maldonado	Corps – Ice Harbor Lock and Dam (Ice Harbor)
Jerry McCann	Fish Passage Center (via telephone)
Robert McDonald	Normandeau Associates (Normandeau)
Sean Milligan	Corps
Paul Ocker	Corps
Cindy Philbrook	Corps
Mark Plummer	Corps – Ice Harbor
Cary Rahn	Corps
Steve Rainey	NOAA
Lynn Reese	Corps
Marvin Shutters	Corps
Mark Smith	Corps

Jana Speer	Corps
Tim Wik	Corps
Rod Woodin	Washington Department of Fish and Wildlife (WDFW)
Karen Zelch	Corps
Tonia Elsey	Corps

The Fish Facility Design Review Work Group (FFDRWG) meeting was held in the Harvest Room on February 25 and 26, 2004, 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 (see appendix, handout 1). He stated the agenda had been revised late yesterday (2/24/04) and now showed the call in telephone number for conference calls. Bill Hevlin asked to add a discussion on the timing of the start date of the juvenile fish transport from the Snake River projects. Marvin stated that was not a FFDRWG issue, it was more of a fish passage operation and maintenance (FPOM) and technical management team (TMT) issue. Bill Hevlin stated he felt FFDRWG needed to discuss it because NOAA has a proposal to move the start date back. Dave Hurson stated juvenile fish transport was strictly an operation issue. He stated juvenile fish transport operating criteria comments were sent out (through FPOM) with no response from any of the agencies.

Bill Hevlin stated at Lower Granite Lock and Dam (Lower Granite) they were going to discuss the baseline spill operation. He stated that he could not see the distinction between discussing the baseline transport operation and the baseline spill operation. He stated that one item should not be particular to this group, while the other item is particular to another group. It needs to be integrated in people's minds. There was discussion on the baseline spill and transport operations. Bill stated NOAA would like to propose not starting transport at Lower Granite until April 20, April 25 at Little Goose Lock and Dam (Little Goose), and May 1 at Lower Monumental Lock and Dam (Lower Monumental). He stated the reasoning behind this staggered start time for juvenile fish transport is in the draft white paper (effects paper) developed by John Williams. He stated because it appears that this year will be an average water year, the point is to leave more of the early migrant fish in the river to get to the estuary in a more proper time. Mark Smith asked if this developed proposal had been presented to FPOM in official format. Bill Hevlin stated he was presenting it at FFDRWG for the record and that it would be presented to FPOM and TMT. He asked if there was any discussion from the states and other agencies. Paul Ocker stated the wild steelhead showed a huge benefit in recent years to an earlier transport season. There was discussion on the on the benefits for some species and lack of benefits for other species.

Rod Woodin stated, now the discussion for delaying juvenile fish transport has been brought up, NOAA should be able to articulate specific objectives for the proposed dates. Bill Hevlin stated the dates are based on when past data appeared to show

improved transport benefits. In order to get started on the scheduled agenda items, the discussion on changing the fish transport schedule was closed.

Steve Rainey stated he would recommend adding some discussion on the Little Goose outfall under agenda item 2, Lower Granite, Juvenile Bypass System (JBS).

Marvin stated the next meeting is scheduled for May 19 and 20, 2004. The August meeting was scheduled for the 18th and 19th, and the November meeting was scheduled for the 3rd and 4th.

1. Lower Granite Transitions Pool Modification. Marvin Shutters stated the Architect Engineer (A-E) contract has not been brought on board yet. The proposal and Government cost estimate has only recently been completed. He stated the A-E contract should be awarded in the next 2 weeks.

Marvin Shutters described the design for the transition pool modifications. He stated the A-E's first task would be to conduct a hydraulic analysis to determine if modeling will be necessary to refine the hydraulic design. There was discussion on how to keep the picketed leads clean.

2. Lower Granite New JBS. Marvin Shutters stated the system configuration team (SCT) asked that the new JBS at Lower Granite be added to the agenda. Marvin stated the last time this was discussed at FFDRWG (2 years ago) the recommendation was that a high velocity-separator would be a desirable feature of the new system. The goal was to see if a high-velocity separator would work well with large numbers of fish going through it. This was postponed last year because of funding cuts, but is scheduled to begin again this summer. He asked the agencies if there were any other issues that needed to be addressed before the Corps begins this design. Rod Woodin stated he would like to see a McNary Lock and Dam (McNary) style full pipe, passive integrated transponder (PIT) detector capability, and a full pipe bypass flow without any separation. Dave Hurson stated that for the long term, if FFDRWG was going to look at conducting partial transport at Lower Granite, they should dispose of the existing separator and up well structures. There was discussion on the changes necessary for conducting partial fish transports.

Marvin Shutters stated that a redesign effort has to happen. He stated once the Corps receives the high-velocity separator results (from a summer study), they should be ready for FFDRWG to decide if it should be recommended to SCT for 2005 funding. He stated maybe they should have it put into the SCT spreadsheet now for fiscal year (FY) 05 to conduct work on plans and specifications. He asked if FFDRWG recommended getting this project into the FY 05 program.

Bill Hevlin stated the reason NOAA was interested in getting this project back on the table and moving forward was because they want the flexibility of being able to transport larger fish as opposed to smaller fish. They want the capability to dial up

juvenile fish transport as well as dialing up the date that transport could begin. There was discussion on the JBS at Lower Granite and the high-velocity separator.

Steve Rainey recommended getting Dr. Jim Congleton (University of Idaho) and some other people that could shed some light on the biological benefits for building a separator. Marvin Shuttters recommended trying to accomplish this in August or September. Rod Woodin stated that WDFW wants to move forward on the JBS even if the high-velocity separator is a no go, essentially, they would like to see a no collect option for putting fish back into the river.

3. Standard Fish Spill for Lower Granite – Should it Change?. Marvin Shuttters stated the issue is the new data compiled from the removable spillway weir (RSW) studies. Dave Hurson stated he thinks the issue is whether or not the RSW is developed far enough that it is now an operational program. There was discussion on spill versus RSW spill at Lower Granite.

Russ Kiefer stated he understands the Corps has a Biological Opinion (Bi-Op) objective of system survival. He stated IDFW, with the D values and delayed survival studies, smolt to adult return study (SARS) on wild chinook are seeing that putting more fish in the river reduces system survival, but seems to improve adult fish return rates. He stated that was the goal, and, if RSW spill accomplishes an improved adult fish return rate by putting more fish over the spillway with less delay in the project, then, that looks like the way to go. Marvin Shuttters stated he thought the data set report showed the SARS as being higher for the transported fish than for undetected fish. There was discussion on fish survival at Lower Granite.

Ron Boyce stated the salmon managers need to discuss the Lower Granite spill issues more and asked if any decisions needed to be made today. Bill Hevlin stated he was hoping to obtain some kind of a consensus recommendation today on the operation. Then, it could go as a recommendation to TMT and FPOM. He asked if there was anyone that did not want to see a 24-hour operation similar to the RSW test operation last year. There was discussion on the RSW operations, RSW study and its results.

Dave Hurson asked if everyone was comfortable with the RSW as an operation method. Rod Woodin stated he did not think anybody wanted to turn the RSW off. Dave Hurson stated the question now is; how do we define standard project operation with an RSW. This is conceivably what the salmon managers need to discuss. Discussion continued on the RSW operations.

Ron Boyce stated in the context of reviewing the technical memorandums and the most recent information on survival data for smolt adult summer migrant fish (out of the Snake River) it appears that there is a micro survival advantage. The existing data is very limited, but it appears there might be a survival advantage for subyearling fall chinook to migrate in-river through the summer. He stated he wanted to pose this concept as an area that has biological promise for improving survival and needs to be

further discussed potentially as a test for this year. There was discussion on the available data pertaining to summer migrant fish.

Bill Hevlin stated there would be hydro-acoustic equipment set up for monitoring spring passage migration through the RSW, and for a decent price, they could extend that evaluation into the summer migration passage through the RSW.

4. Lower Granite Behavioral Guidance System (BGS) Study. Tim Wik stated 2 weeks ago the decision was made to provide some funding for an RSW test at Lower Granite. Requests for proposals have been sent to the two professional service contractors (Battelle and Normandeau) to provide a hydro-acoustic study this spring. Tentatively, the Corps will operate the RSW plus some amount of training spill, 24 hours a day for an approximate 45-day period between April and May. He stated the BGS will be shortened in depth and moved to between units 5 and 6. The current plan is to move the BGS in and out periodically to assess its impact on RSW passage. There was discussion on the amount of training spill needed for this upcoming test and the previous RSW spill tests. Steve Rainey stated he was opposed to using less than 12 thousand (k) spill for the test. Tim Wik stated there would not be much difference in spill passage between 8k and 12k spill. Discussion continued on the amount of training spill to use for the test. Maximizing spillway passage in terms of survival was put on the table for discussion in FY 05.

Steve Rainey stated last year it was determined that the BGS prototype was old enough that it probably would not withstand an in and out test and wanted to know why it was capable of withstanding the test now. Kevin Crum stated a contractor has done an assessment of the BGS and made a list of things needing to be fixed. He stated the Corps is replacing all the lines that are used to hold the BGS in position. There was discussion on what is currently being done to the BGS.

Kim Fodrea asked if they were talking about additional spill for this summer. Bill Hevlin stated the tests would require additional spill. Kim stated BPA is pushing real hard for spill reduction, and the test plans seem to have no consideration for the operational costs for the additional spill. She stated it seems that the consensus of the region is fish versus cost.

Kevin Crum stated, if the test goes well this year, he anticipates conducting a BGS study next year. There was discussion on future BGS studies. Kevin stated the BGS was built in 1998 as a temporary structure, and the opportunity to use it might not last much longer.

5. Ice Harbor Lock and Dam (Ice Harbor) RSW. Kevin Crum distributed handout 2 (see appendix, handout 2). Kevin stated the design schedule for the Ice Harbor RSW is right on schedule. He stated the RSW should be deployed by the FY 05 fish out migration season. He stated the Corps is adjusting some of the contract methods in order to give the construction contractor more time than what they received for construction of the Lower Granite RSW. He explained the new contract process and

went through the milestones of the project (see appendix, handout 2). Kevin stated the awarded construction contractor will have from May 2004 until February 2005 to fabricate the RSW, delivery will be no later than February 20, 2005, and installation no later than March 20, 2005 (see construction schedule milestones, appendix, handout 2).

Rod Woodin stated, as far as the fish-monitoring season is concerned, he feels evaluation of the summer passage period should have a higher priority than the spring period. He stated summer survival is a big issue.

Kevin Crum stated there are still some issues involved with this project. He stated there is no data available yet from this spring and summer's spillway survival tests that will be conducted at Ice Harbor this year. He stated if there were potential problems with the data, the question would be; how does it impact the RSW construction schedule. Spill or operational changes could change the economics. He stated construction funds are also an issue. The project is only partially funded, and the Northwestern Division (NWD) is trying to make sure funds will be availability at the time the contract bid is awarded.

Kevin stated the Ice Harbor RSW is very much like the Lower Granite RSW design. The main difference is the chute is a little different and should be a smoother transition than the one at Lower Granite. There was discussion on the differences between the two RSWs and the estimated cost for the Ice Harbor RSW.

6. Ice Harbor Stilling Basin Dam Safety Study. Lynn Reese stated one thing on the table to accomplish this summer is to evaluate spill operations. He stated that means to take the information available on state projects as well as working with corporate to get a handle on how past operations have gone, what has been observed in the hydraulics, and the physical changes going on at the projects. He stated his team would gather all that information and summarize it. The goal is to help decide how the projects should be operated (long term) from a dam safety perspective.

7. Survival Studies.

a. Lower Monumental. Mark Smith stated the Corps is going to conduct a radio tag survival study to observe full project survival that is route specific under two spill treatments. One treatment will be conducted using the Bi-Op fish passage plan spill patterns and volumes. Last year's initial pilot study indicated survival may not be as good as everyone thought, so it was decided to obtain a better baseline of information from the current spill patterns. The second treatment, being designed, is a bulk spill treatment similar to what was looked at last year at Ice Harbor with the indication that a higher gate opening could improve survival. Mark stated his team would be using the general model at Engineering Research Development Center (ERDC) next week to determine and better design exactly what the second treatment will entail. He stated this survival study would be conducted during spring passage only.

b. Ice Harbor. Mark Smith stated, based on the last several years of studies, the team has made some refinements to the survival study for Ice Harbor. The study will be conducted using radio tags and a two-treatment test. Last year's test indicated higher spill may have an increased survival rate. One treatment will be conducted using a low gate opening, which will be three stops across the project [45 to 50, 1,000 cubic feet per second (kcfs)]. The second treatment will be conducted using bulk spill similar to last year (with refinements) in hopes of obtaining better tailrace egress. Mark stated this survival study would be conducted during both spring and summer passage.

Dave Hurson asked where the fish would be tagged. Mark Smith stated all the fish would be tagged at Lower Monumental in June. He stated the study would begin sometime shortly after spill begins. There was discussion on the two studies and the general model.

Steve Rainey stated past studies have shown good survival rates with spill above 90k at 100 percent and below 90k at 80 percent. He stated a key element in survival studies is that there really are no survival problems at high spill, and the study should focus on a mid range to lower spill. There was continued discussion on the studies.

Eric Hockersmith stated even if flows were high at Ice Harbor it would not matter because the study is going to be conducted during the summer as well. Since the study is continuing on into the summer fish passage season, there will be lower flow levels and tail waters with which to test. He stated there would be a wide range of motions in which to obtain test data.

Mark Smith stated the Corps is going to conduct a direct survival balloon tag study at Ice Harbor next month that should answer some questions for the spring and summer survival study. Mark explained the upcoming test. There was discussion on the upcoming survival studies.

8. Ice Harbor Turbine Rehabilitation. Martin Ahmann stated the turbine rehabilitation would be conducted on turbine unit 2. He stated the rehabilitation is looking at a March advertising and installation of a new runner by November. He stated the team is attempting to schedule some model studies of the proposed runner design. Martin stated he has been working with the Department of Energy (DOE) and Operations Division has been working with the Environmental Protection Agency (EPA) to determine what design modifications are reasonable with respect to fish passage and water quality. He stated the focus of this design is to eliminate the potential for oil leakage by implementing new oil-less hub technologies. He stated the Corps has specifications for optional items that might also result in improved fish passage. Martin stated his team would evaluate any design that was brought to the table at ERDC.

9. Emergency Auxiliary Water Supply (AWS). Cary Rahn distributed handout 3 (see appendix, handout 3).

a. Ice Harbor. Cary Rahn stated all three pumps are installed and running on a rotating basis. The latest round of work declared the contractor deficient in supplying what was considered new gear reducers. Initially, there was rust found in all three gear reducers. The contractor took the gear reducers off site starting in late December, remanufactured all three, brought them back, and as of 2 weeks ago finished the installation of the third gear reducer. The issue of excessive vibration in gear reducers 1 and 2 has been resolved. Cary stated pump 3 still has a vibration issue, but, according to the Corps' mechanical engineer, is not due to hydraulic conditions down in the sump. Based on the vibration data he collected, he is seeing a fundamental frequency of the bull gear. It has been determined the contractor has met all of his obligations with respect to the pump installation deficiencies.

Cary stated his team has made the decision it is not necessary to proceed with sump modifications, constructing the Formed Suction Inlets (FSI), which will remove \$1,550,000 from the FY 04 and FY 05 funding plan.

Cary stated the one open issue left on this project is the replacement of oil seals on the shaft bearings. His team is pursuing replacing the oil seals with a seal less oil-bath Babbit type sleeve. He stated plans and specifications for this replacement would begin next week. He stated he would like to do the work this fall. To do the work this fall requires approval from the fish agencies to perform construction on the standby pump outside of the normal construction window. This replacement work would take approximately 2 1/2 months and would also take the emergency standby pump out of service for approximately 2 weeks. There was discussion on replacing the seals. After much discussion, FFDRWG decided an acceptable start date for replacement work on the seals was November 1, 2004.

b. Lower Monumental/Little Goose/Lower Granite. Cary Rahn stated the verification of the numerical modeling is being conducted in-house. He stated the Corps' hydraulic design personnel are currently collecting raw data to compare with the numerical model. Sometime around the May/June timeframe (depending on flows) this personnel will collect more data at high tailwater conditions to calibrate into the numerical model for a wider operating range. Cary stated, if after the models are calibrated and they prove to be a reliable tool, his intent is to request additional funding (in-house) to enable his team to create a technical report. There was discussion on the numerical modeling.

10. Lower Monumental Parapet Wall. Randy Chong distributed handout 4 (see appendix, handout 4). Randy stated the Corps team went to ERDC the beginning of February to observe the model. They compared their observations with last year's video of the model and created some alternatives.

a. Alternative One: On the south side, the dimensions for the wall would be 10 feet high by 160 feet long. That would step down to a 6-foot by 80-foot wall. The north shore wall would be a 10-foot by 80-foot wall. The north shore has an existing training wall that is 10 feet wide. There was some concern about the possibility of fish

becoming stranded on the training wall. The team is looking at placing a slanted cap on the wall so that any fish that got out there would fall off into the water. The estimated cost for this alternative would be \$215,000. There are currently side fish entrances on both the north and south shores with gates that are never used and would not need any structural work conducted on them. Operationally, there might be some advantage to installing permanent bulkheads (\$228,540) or filling the void with concrete (\$362,080) to obtain a flush wall against that mouth. Filling the void with concrete would require some in-water work. There was discussion on the installation of bulkheads versus filling the void with concrete.

b. Alternative Two: This alternative is basically all the same components as Alternative One minus the cap on the training wall. The estimated cost would be \$162,000; \$275,700 with the permanent bulkheads or \$309,240 to fill the void with concrete.

c. Alternative Three: There is a lot of material involved with the cap for the training wall, so this alternative considers constructing the parapet wall all the way out to the end of the training wall on the north shore. The estimated cost for this alternative is \$237,620; \$351,000 with the permanent bulkheads or \$384,700 for the concrete fill.

There was discussion on the three alternatives. After much discussion, FFDRWG opted for Alternative One with a possible alternative to filling the void without having to cast concrete in place underwater.

There was discussion on the pros and cons of a parapet wall. Randy Chong stated the team plans to be ready for this project by the end of this FY, award contract after the beginning of the new FY, construction during the winter of 2004/2005, and be ready for the 2005 fish season.

11. Lower Monumental Outfall and Divider Wall. Randy Chong stated the Corps had planned to conduct all the modeling and complete the report this year, but, because of funding constraints, they will only be able to complete the modeling. The modeling is being scheduled (April) to coincide with any modeling efforts for the Lower Monumental RSW. They need to coincide efforts because an RSW could affect the location of the outfall and the length of the divider wall. There was discussion on the modeling. Rod Woodin asked if there was a projected date for the outfall relocation. Randy stated, pending funding, the team plans to work on the report in FY 05 with possible relocation in FY 06.

12. Schedule for Future RSW Construction. Kevin Crum stated there is funding available in this FY to begin investigations for an RSW at Lower Monumental. As Randy indicated, the Corps has plans to conduct RSW modeling along with the outfall and divider wall modeling efforts. He stated the question has been raised as to where to go next with an RSW (after Ice Harbor). Kevin stated the next most cost effective site for an RSW would be Lower Monumental.

Kevin stated, looking at the installation of an RSW on a long-term situation, it really does not matter where an RSW is installed next because, conceivably, there could or should be an RSW at each project. This would enable fish to get through the system more quickly with little impact to the mechanical systems of the projects. He stated on the short-term side of things there could be a debate on the benefits of an RSW at Lower Monumental versus Little Goose. Lower Monumental has more economic and fish benefits than Little Goose. He stated there are probably more reasons to stay on track with an RSW at Lower Monumental. One good reason would be spillway survival. Spillway survival at Little Goose is already really good. Steve Rainey disagreed that spillway survival at Little Goose was good. There was discussion on the spillway survival at Little Goose.

Bill Hevlin stated spillway survival is definitely one issue that should be considered for installation of an RSW, but would like to see a rationale developed as far as biological considerations of which project to go to next. Dave Hurson stated the RSW was tested at Lower Granite, and Ice Harbor showed a lot of financial benefits. Now there are two projects left. The decision on where to go next should be directed towards meeting the performance standards in the Bi-Op. He stated there are several action items directed to poor performance at Lower Monumental. The Bi-Op directs the Corps to evaluate several different alternatives and to make progress. Dave stated they are currently over 3 years into the Bi-Op, and nothing has been done. His question was; when do we start addressing the biggest known problem in the Walla Walla District. There was discussion on the different things that have been attempted to make improvements at Lower Monumental.

Marvin Shutters proposed to have the RSW research team capture all the alternatives in a report and conduct a special meeting to discuss all the alternatives for installing an RSW at Lower Monumental or Little Goose. There was more discussion. Kevin Crum stated there should be a subgroup meeting in approximately 1 month to discuss, in detail, which project should be next.

Kim Fodrea asked why there was such a push to get an RSW installed somewhere. Kevin Crum stated the BPA cost efficiency report stated that Lower Monumental was next for an RSW, and the date was 2006 for installation. If there is any hope of meeting that date, we need to move forward very soon. There was more discussion on the next location for an RSW and the modeling that needs to be accomplished.

Marvin Shutters suggested that all the agencies send their ideas, logic, data sets, *etc.* He stated the team would have someone consolidate it into some kind of a logical report. This report could be used as a basis of discussion to talk through all the points for RSW location. After some discussion, it was decided to have all the input provided to Kevin or Marvin by March 22, 2004. A conference call, to discuss the input, was scheduled for April 5, 2004, at 1 p.m. Bill Hevlin asked that the report be put on a website or distributed so everyone could have access to it.

13. Separators – McNary and Lower Monumental. Marvin Shutters stated Steve Rainey had requested this be put on the agenda in order to get some questions answered. Steve Rainey stated Rebecca Kalamasz had been put in charge of the separation program that started 10 years ago. Over a number of years, a separator evaluation facility was built at Ice Harbor. Steve explained everything pertaining to fish separation that had been done in the past years. There was discussion on all the fish separation work that has been accomplished at McNary and Lower Monumental.

Marvin Shutters stated it sounded as if it was the recommendation of FFDRWG that making the fish separator at McNary more permanent was worth looking into. He stated he would talk to Dana Knudsen and get it on the books for funding next year.

14. Ice Harbor Full Flow PIT. Marvin Shutters stated the design team has begun work on the full flow PIT tag detection. He stated they are going with the layout that was decided on 1 year ago. Bill Hevlin stated the plan was to get the full flow PIT tag detection installed for the 2005 fish migration.

15. Lower Monumental Loading Flume Dewatering. Lynn Reese stated the team for this project is attempting to have the hydraulic piece finished by mid-May. It will be ready to turn over to the designers after that.

Paul Ocker announced that Dave Hurson was ill, and he said the earliest date he would be available for a discussion on fish transport would be March 10 or 11. A special meeting was set for March 11, 2004, in the afternoon in Portland, Oregon.

Marvin Shutters stated the high-velocity separator study plans need to be added to the agenda.

16. McNary Hoists and Lifting Beam. Bob Hollenbeck stated the project was actually for McNary spillway gate rehabilitation. The contract was advertised in December 2003 and awarded with notice to proceed on January 28, 2004. Immediately following the notice to proceed, the Corps received a bid protest from Thompson Metal, the apparent low bid. Bob stated it went through a General Accounting Office (GAO) bid protest and GAO ordered a stop work. The Corps is presently under a 100-day waiting period until GAO can make a determination. He stated the soonest start date for any gate rehabilitation will be May 15, 2004. The lifting beams should be complete by April 15, 2004. There was discussion on the McNary spillway gate rehabilitation project. Bob stated that four gates will still get finished, but not before April 15. He stated the contract would probably be carried into September 2004. He stated there is an option in this contract to get four more gates completed if funding is available. There was more discussion.

17. McNary Modernization. Rick Emmert stated the Corps would like to set up a meeting in Portland, Oregon, when Gary Fredricks could attend. Rick stated the Corps would have an internal team meeting next week to see where they are on gathering the additional information that is needed, so there will need to be a meeting with the

agencies to bring them up to speed with the project and make sure that all the necessary data is going to be provided. He stated three turbine vendors have provided turbine designs, and the team is still in the evaluation process of selecting a turbine vendor. He stated the team is still running through the model testing for ERDC and have finished the independent laboratory testing. An award for a single prototype unit could be accomplished in September 2004. The current schedule for installing the prototype for field-testing would be July 1, 2005, through March 31, 2006. There was discussion on the vendor proposals.

Rick stated there have been several contracts awarded to conduct the upgrading of the electrical equipment. There are some contracts going out for bid to conduct bridge crane, intake, and draft tube upgrades.

Rick stated the biggest project that will be accomplished this year on McNary Modernization is the biological studies. The team intends to obtain baseline data on project survival and observe the new vertical barrier screens (VBS) that have been installed. He stated the new traveling VBS are also installed and working. There was discussion on the traveling VBS. Rick stated the Corps is purchasing radar sensors to monitor the gatewells this year. There was more discussion on the traveling VBS.

Mark Smith stated the Corps team is setting up the biological testing to include fish guidance efficiency (FGE) testing in units 2, 3, and 4 using the hypothesis that FGE is different with different turbine loadings. The FGE test will be conducted in a 2-day block design of the three units. There will be hydro-acoustic transistors in all three units. The radar system to look at head differential will have to be in place. The studies are being coordinated, and the necessary equipment is being installed and will be available by April 15, 2004. The FGE test will run from April 15 to approximately mid July. Mark stated the ending date would depend on when the shad began coming through. He stated the Corps would also be conducting a gatewell fish condition study from April 15, 2004, through the entire fish passage season. This gatewell fish condition study will include yearlings, steelhead, sockeye (if available), and subyearlings. The team will obtain eight estimates of each species throughout the season. The test will be conducted with fish being released directly in the gatewell using PIT tags and recovered at the facility.

Bill Hevlin stated that SCT was surprised the test was not going to include fry. Mark stated it would be too difficult to PIT-tag fish that small. There was discussion on the advantages of conducting a study with fry and what would be needed to conduct a VBS monitor.

Rebecca Kalamasz stated using the preseason test fish to make releases into units as they approach their critical head differential is an issue that came up for discussion in the last McNary 1 percent project meeting. The biological testing, alternating between units 2, 3, and 4; and 5 and 9, will complicate the McNary 1 percent testing. Mark stated the biological test would be releasing fish when the team feels that

debris is high. If the gatewell appears to be high in certain units, then they will release fish in that unit. There was discussion on the biological testing design.

Ron Boyce stated he had concern about the subyearling, lamprey, and fry fish. He asked if there were anyway to obtain some real time defense of potential injury to fry or lamprey short of seeing them plastered on to the VBS. Brad Eby stated the first place the fry are seen is on the separators. He stated his team would be at McNary three times a week to gather fish for EKG evaluation and that might be the best time to look for fry. There was discussion on the different ways to evaluate the fry and lamprey.

Rod Woodin stated he was interested in attempting some fairly rigorous short duration tests to obtain recovery and injury rates using a sample of 100 hatchery fish from Priest Rapids.

Marvin Shutters suggested the Corps team work with Brad Eby and Roseanne Tudor, discuss the feasibility of running a sample test using fry fish, and report back to the McNary Modernization subgroup. A McNary Modernization subgroup meeting was scheduled for March 23, 2004, in Portland, Oregon, at 9 a.m. There was more discussion on the possibility of testing using fry fish and/or lamprey.

18. McNary Survival Study. Mark Smith stated the McNary survival study is proceeding as proposed in the Bi-Op. The installation has begun and has been coordinated with the project. He stated the study would be a radio telemetry study to observe project survival and route specific survival with steelhead, chinook yearling, and subyearling fish being released upstream as well as downstream. There was discussion on the fundamentals of the study.

Brad Eby stated one thing to keep in mind, as far as the McNary survival study is concerned, would be the fry fish. The study needs to focus on qualitative monitoring of different points in the system. Rod Woodin proposed obtaining appropriately-sized fish from Priest Rapids in April and attempting some short-term tests to observe the effects of the gatewell environment using some fin-clipped fry fish. Brad Eby stated it would be beneficial to obtain the information on where the problems were for fry fish before in-river fish start arriving in big numbers. Mike Gessel stated he had tried to obtain small fish for a cylindrical dewatering screen test and found it to be difficult to find fish smaller than 55 millimeters. There was discussion on how to obtain the right-sized fish.

19. Operation of McNary Turbines above 1-Percent Peak Efficiency – Monitoring Plan. Rebecca Kalamasz distributed handouts 5a, 5b, 5c, 5d, and 5e (see appendix, handouts 5a, 5b, 5c, 5d, and 5e). Rebecca stated she would summarize the McNary 1-percent discussion that took place at the regional Study Review Work Group (SRWG) meeting and discuss the action items that came out of that meeting. She stated Steve Rainey wanted to discuss some concerns with head differential. Kim Fodrea would summarize the McNary 1-percent summer operation, and Marvin Shutters would talk about the descaling data. Bill Hevlin stated he had some concerns with the reduction of spill that needed to be discussed.

Rebecca Kalamasz stated approximately 2 years ago, BPA requested that the Corps start changing operations at McNary to go outside the 1-percent efficiency performance curve. That request went through many of the different organizations in the region and ended up coming to SRWG to evaluate and construct a study design. Last year, during the pilot study, the Corps received information showing that the sample sizes required to detect the 2-percent difference that the region had requested was too large and was not feasible based on the numbers of fish required for marking and the cost involved to do the marking. The McNary 1-percent project team proposed that they would conduct descaling monitoring at the two operations and use that data as decision criteria. The BPA then requested that the Corps go to a 1-percent operation and monitor for impacts to descaling. This latter request went up through the chain to the Federal executives. The Federal executives asked the team to work with the region in developing a monitoring plan to alleviate the potential impact, or at least provide a heads up to potential impact to switching to a 1-percent operation. Rebecca stated the team discussed how to build the monitoring plan at a special FFDRWG meeting in early February. She stated the team determined that there are two types of monitoring proposed for next year if McNary were to go to a 1-percent operation. The first type of monitoring is to provide information for in-season management decisions. It is important to note that this is monitoring only, not an evaluation of the effects of two operations. The second type of monitoring is to provide documentation of fish passage behavior, timing, and project operations that occurred during the outside of 1 percent turbine operation. Because there will be only one operation, there will be control to which the change in operation will be compared. The concerns that fell into the category under seasonal monitoring are shown on the handout (see appendix, handout 5a). Rebecca stated the first concern on the list was the reduction of involuntary spill, which could result in the decreasing of FPE, potentially, diverting fish from a high survival route of passage to one of the lesser routes. Bill Hevlin stated he had a problem with reducing project survival, and the team needed to develop a way to monitor project survival without reducing spill. There was discussion on the different monitoring concerns listed on the handout (see appendix, handout 5a). Rebecca stated the BPA request was to remove the 1-percent restriction, and the team was asked to develop a monitoring plan to reduce the risk of a 1-percent operation (meaning the request was to reduce the voluntary spill). Bill Hevlin disagreed with the reduction of voluntary spill because it would reduce project survival. Marvin Shuttles stated the monitoring has to be conducted so the project knows what actions have to be taken (for fish survival) if the Corps is directed to abandon the 1-percent restriction. There was much discussion on the McNary 1-percent proposed monitoring.

Kim Fodrea explained the graphs that depict summer operation conditions (see appendix, handouts 5b and 5c). Kim stated the bold yellow, blue, and red lines are the latest forecasts from heights and modeling (typical 14-period type model). The blue line represents the average anticipated forecast. The red and yellow lines represent the range that is being forecasted as the possibility around the blue line forecast. The smaller colored lines represent the powerhouse capacity for different operations. The bottom line (all turbines within 1 percent) represents 12.2 kcfs). Then the line steps up

to adding 4 units at 16.4 kcfs (covers the McNary Modernization testing) and incrementally continuing to add more units at the maximum turbine discharge. She stated, if on July 1, there is 200 kcfs (indicated by the broken line), BPA would propose to operate the powerhouse with 6 to 8 units at 16,400 cfs. Rebecca Kalamasz asked why BPA would propose to operate outside the 1 percent if they could operate more units within 1 percent. Kim explained all the units would already be up to the 1-percent limit (170 kcfs), and at 200 kcfs, there would be more water available. The first proposal would be to operate 6 to 8 units outside the 1 percent with the rest of the units operating within the 1 percent (12.2 kcfs). The second proposal would be to operate with all 14 units at 14 kcfs, which would put all the units outside the 1 percent, but not at the fearful 16.4 kcfs. Kim stated there is a power revenue advantage to going outside the 1 percent late in the season. There was discussion on the graphs and proposed operations.

Rebecca Kalamasz stated there was concern of impact to other species, which included fry, lamprey, and kelt. She stated the best way to evaluate the descaling of the juvenile fish is through the impacts to the gatewell environment. The McNary 1-percent monitoring team discussed two ways to evaluate the impacts to the gatewell environment. The team discussed using the existing study, but decided that the PIT-tag data did not reflect what was occurring throughout the whole system. The team plans to monitor the fish from the juvenile fish. The Corps was given the task to go through the historical data and attempt to set a baseline descaling data for each species at that project and establish two levels of criteria. The first level would be a trigger for project personnel to assess the whole facility to ensure that it is not occurring somewhere else in the facility. The second level would show a higher descaling threshold, which would trigger an immediate response in which the units would be lowered back down to within 1 percent.

Marvin Shuttles explained the graphs depicting yearling and subyearling chinook descaling percentages (see appendix, handouts 5d and 5e). Marvin stated the handouts depict the daily frequency percentage of descaling using sample fish from McNary (over a 4-year period). The group discussed the graphs and how the data could be used to develop plans for detecting increased descaling percentages. Marvin explained the graph depicts that, over a 4-year period, there were 10 days where descaling was over 4 percent. Mike Gessell stated the graphs are proof that the vast majority of descaling for yearling chinook occurs in June. There was discussion on the graphs and descaling problems at McNary. Rebecca Kalamasz stated one task is to determine at what level of descaling does project personnel assess the project, PIT-tag data, and the condition of fish arriving from other projects to make the decision to change operations back to within 1 percent. The second task is to determine at what level is the emergency stop criteria threshold, how high above the baseline data before turbine operation is automatically lowered to within 1 percent. There was discussion on the descaling problems at McNary and how best to address it.

Rebecca Kalamasz stated the discussion laid out two options. The first option is the frequency distributions, and the second is weekly distribution of descaling data. There was more discussion.

Rebecca stated the team also discussed debris and head differential on the VBS. Steve Rainey stated, with the backset porosity plate and the VBS (with a clean screen scenario) the project has attempted to design a scenario (with the porosity plate) to obtain the most uniform velocity distribution on the VBS. He stated that the mesh has very negligible levels of differential if it is clean, but with the 1-percent operation there is a 1/2-foot of head differential. The additional head of differential to the 1.5 cutoff is essentially 1 foot of head of debris on the mesh. He stated the additional head differential means cleaning the VBS more often. There was discussion on the head differential criteria.

Rebecca Kalamasz stated radar sensor systems are being installed in 15 of the gatewell slots. These radar sensor systems will enable the project to monitor the units for increased head differential caused by debris plugging the screens.

Rebecca Kalamasz stated the 1-percent team did not come to any consensus on the criteria to use for summer operations (see appendix, handout 5a, summer operation section). After some discussion, FFDRWG decided the summer operations should use a similar approach to descaling as the spring operation. Ron Boyle stated summer operation should include weekly frequency distributions of the facility mortalities. There was discussion on the summer operation criteria.

20. Ice Harbor High Velocity Separator. Mike Gessel distributed handout 6 (see appendix, handout 6) and asked everyone to read through it quickly. Mike Gessel stated the existing plan is to transport fish from the gatewell at Lower Granite, transport them by truck to Ice Harbor, release them in the test channel that Lynn McComas (NOAA) has been working on, and attempt to simulate a high-density test of fish to observe whether or not they still separate. He stated the parts and pieces of the high-velocity separator have been tested, and it all appears that everything should work well. Mike stated the high-velocity separator needs to be tested as a prototype, but felt that it would be better tested at Lower Monumental than Ice Harbor. There was discussion on the advantages/disadvantages to building a high-velocity separator at Lower Monumental. Mike stated continuing to attempt high-density testing at Ice Harbor would not answer any questions. He stated, if the Corps and agencies did not want to build a prototype at Lower Monumental, the best bet would be to build a prototype at Lower Granite.

Marvin Shuttters stated FFDRWG had this identical discussion at least 1 year ago. Mike Gessel stated last year it was construed that time was critical. Obviously, time was not that critical; Ice Harbor was bypassed last year because of the lack of funding, and he asked what was the schedule for Lower Granite. Steve Rainey stated there has been discussion on the fact that some fish do better in-river at certain times, and some species do better being transported. He stated, in the context of Lower Granite, there

would be times that it would be beneficial to proceed with transporting one fish species and send another fish species back to the river. To do that, it would require this improved separator. He stated, as the science center research begins to come in, the decision to leave fish in the river or transport fish would be better defined. The research will aid in refining that decision-making tool. The facilities modifications would have to be consistent with the research.

Mike Gessel stated the biggest question is, if the testing were conducted as proposed (high density only) at Ice Harbor, would it supply anymore information than what is available at the present time. He stated the team feels that a prototype at Lower Monumental would produce the best evaluation of a high-density test. He stated it would be futile to continue transporting fish and testing them at Ice Harbor, because they would not be able to obtain any more information than what is already available. Steve Rainey asked what a new test separator at Lower Monumental would achieve that the one at Ice Harbor would not. Mike stated the Ice Harbor high-velocity separator could not run adult fish and trash with juvenile fish. The way it is set up now, it will only run juvenile fish separation or adult fish and trash; it cannot do both. Without modification at Ice Harbor or moving to Lower Monumental, the team cannot test how separation will occur with the entire system. There was discussion on the high-velocity separator testing. After much discussion, it was suggested that a subgroup work out all the details and set up a meeting or conference call to discuss what, where, and how high-velocity testing should be conducted.

21. Major System Improvements Decision Analysis. Rebecca Kalamasz distributed handout 7 (see appendix, handout 7). Rebecca stated the Major System Improvements Decision Analysis is broken into two sections. The first section is to look at the overall system, and the second is to look at Ice Harbor analysis. The objective for the Ice Harbor analysis was to confirm if the RSW was a viable option for project survival. The analysis has been completed, but the report has not yet been finished. She stated the handout contains summaries of the Major System Improvements analysis. Rebecca stated the team took data from approximately 35 operations at Ice Harbor, along with 7 construction items, and looked at the project survival for spring and fall chinook only (no steelhead). The chinook data was developed and agreed on at the joint data review meeting. The data included Lower Granite with RSW data and Ice Harbor data. Rebecca briefly explained the graphs in the handout. Rebecca stated she had been directed by the District to reassess, develop a new scope, and develop a new plan and schedule. This new plan and schedule will be presented to the District on March 10, 2004. There was discussion on the graphs and decision analysis.

22. McNary Forebay Temperature. McNary forebay temperature was not discussed.

Appendix, Handout 1 – Agenda

Fish Facility Design Review Work Group Harvest Room

25 and 26 February 2004

Call in Number: 888-603-7024 PASSCODE: 13390

9:00 am 25 February:

Lower Granite Transitions pool modification -Shutters

Lower Granite – New JBS?

Standard Fish Spill for Lower Granite Dam. – Should it change?

Lower Granite BGS study -Wik

Ice Harbor RSW – Crum/Reese

Ice Harbor Stilling basin dam safety study –Reese.

Survival Studies: - Smith
Lower Monumental
Ice Harbor

Ice Harbor turbine Rehabilitation – Ahmann

Ice Harbor Full Flow PIT -Gregory

Ice Harbor AWS –Rahn

Lower Monumental Parapet wall- Chong

Lower Monumental Outfall and divider wall - Chong

Schedule for future RSW construction –Crum

Lower Monumental loading flume dewatering –Gregory

Separators – McNary and Lower Monumental

0800 26 Feb.

McNary Survival Study -Smith

McNary Hoists & lifting beam –Hollenbeck/Chong

McNary Modernization –Emmert/Smith

Operation of McNary Turbines above 1% peak efficiency – Monitoring Plan -Kalamasz/

Appendix, Handout 1 – Agenda (Continued)

McNary Forebay Temperature -Smith

Major System Improvements – Decision Analysis -Kalamasz

Appendix, Handout 2

Fish Facility Design Review Work Group
Harvest Room
25 and 26 February 2004

Ice Harbor RSW

General status:

Design is progressing on-schedule, maintaining the opportunity to construct and install an RSW for fish out migration in 2005.

Design/Solicitation Status:

Contract type: **Lowest Price Technically Acceptable** (request for proposal - RFP)
This is a new process the Corps is implementing on this contract (and other contracts) to increase exposure period of the project to prospective bidders, and allow a process for the Corps to determine technical capability of bidders prior to requesting price proposals.

milestones

- Solicitation for “technical” proposals issued Feb 3 2003, based on 60% design.
- Technical proposals are due March 4, 2003
- Selection of “technically qualified” – 15 March 2003
- Request price proposals, based on prelim designs – 16 March 2003 – off ramp?
- BCOE review meeting - 18 March 2003
- Finalize drawings/specs - issue to bidders - 12 April 2003
- Request final price proposal – 22 April 2003
- Award RFP contract – 5 May 2003 – off ramp?
- Notice to proceed – 15 May 2003

Construction Schedule:

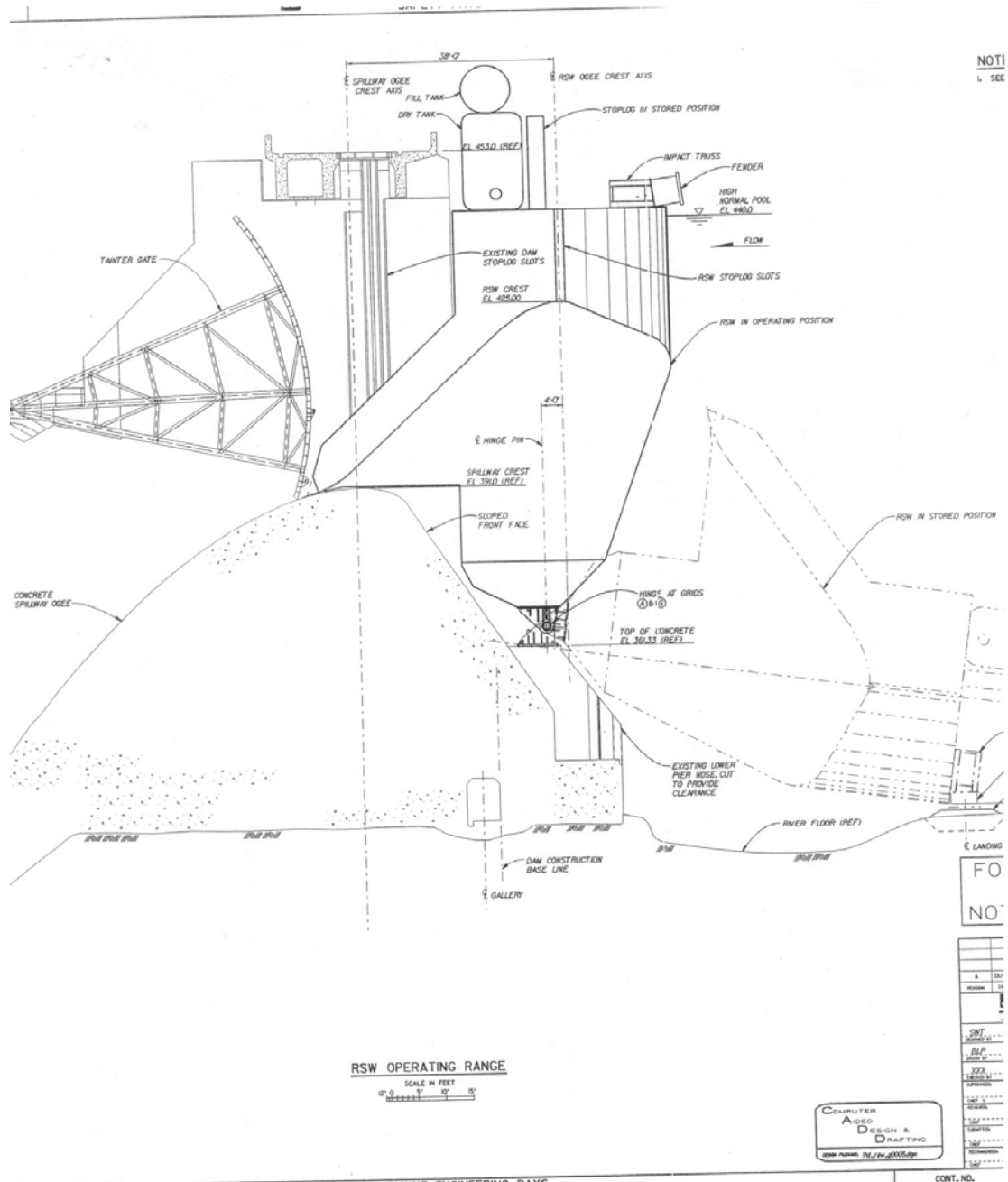
milestones:

Fabricate RSW	15 May 04 – 20 Feb 05
Install seals/hinges	Sept 04 – Feb 05
Install Landing Pad on bottom	15 Dec 04 - 28 Feb 05
Deliver to Ice Harbor	NLT 20 Feb 2005
Install at Ice Harbor	NLT 20 Mar 2005
Install Fish M&E equip	NLT 10 April 2005
Fish Monitoring Season	10 April 2005 – 31 May 2005 (details tbd)
RSW commissioning (sink/raise)	Sept-Nov 2005

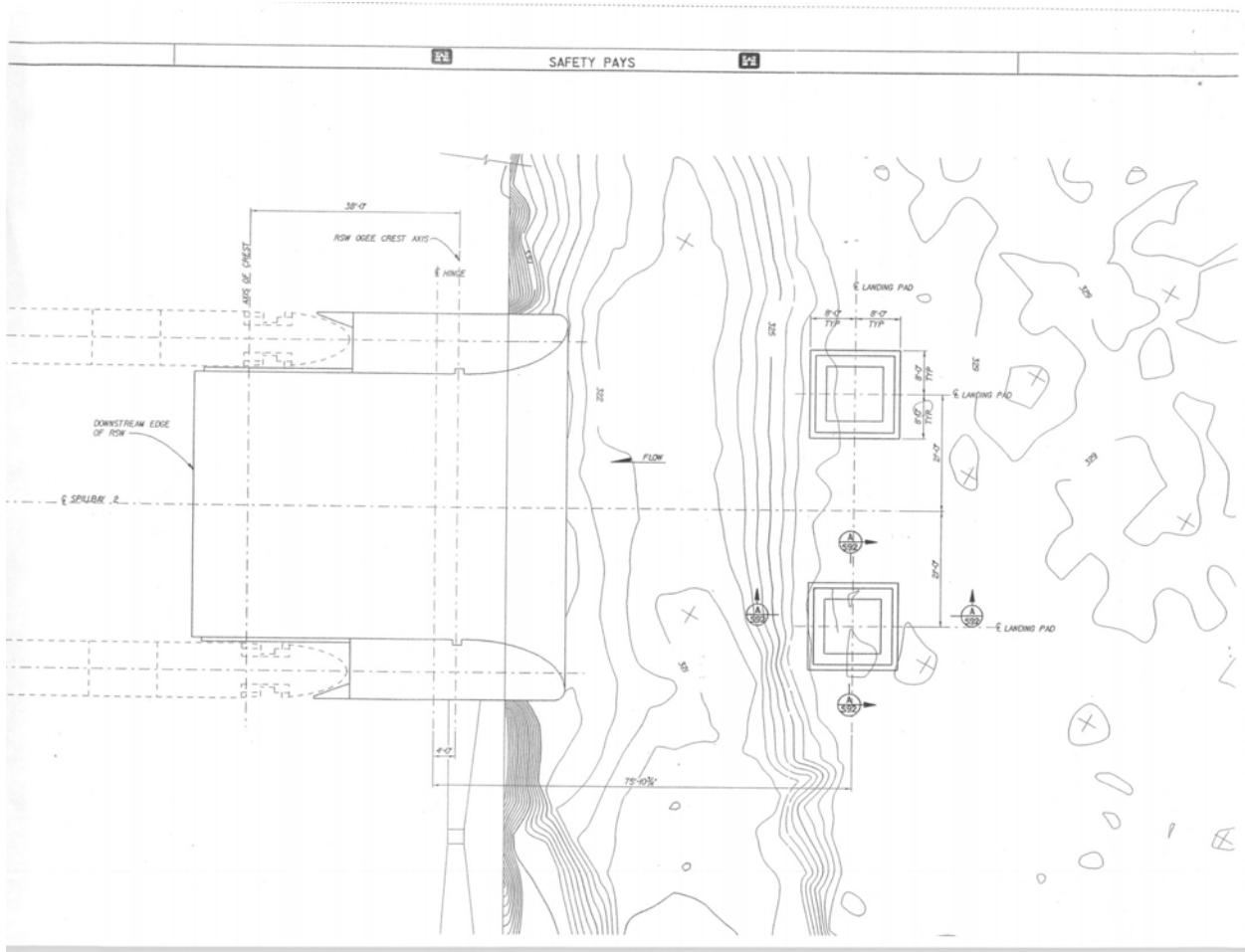
Issues:

- Ice Harbor spillway survival tests – impact to RSW construct schedule
- Spill – operational changes, stilling basin erosion issues, may alter RSW design path
- Construction funds – availability at time of award
- Contract off ramps – potential for either to effect a change in direction.

Appendix, Handout 2 (Continued)



Appendix, Handout 2 (Continued)



Appendix, Handout 3

**Fish Facility Design Review Work Group
Walla Walla District
February 25, 2004
Ice Harbor Emergency Auxiliary Water Supply**

Status:

Three pumps installed and operating on rotating basis.

Resolved Issues:

- **Internal Rust in Gear Reducers**
 - Gear Reducers returned to the factory, overhauled, returned to service
- **Vibration during Pump Operation**
 - All pumps running smoother.
 - **Vibration on Pump #3 is not due to sump hydraulic conditions**
 - Pump #3 vibration is fundamental of bull gear frequency
 - Pacific Northwest National Laboratory Report indicates existence of cavitation and vortices in sumps. Cavitation not expected to cause unacceptable accelerate wear. Impellor life expectancy 78 years.
 - **Decision not to proceed with Sump Modifications, constructing Formed Suction Inlets (FSI).**
 - Removes budgetary estimate of \$1,550,000 from FY04 & FY05 funding plan.

Appendix, Handout 3 (Continued)

**Fish Facility Design Review Work Group
Walla Walla District
February 25, 2004
Ice Harbor Emergency Auxiliary Water Supply**

Open Issues:

Replacement of Oil Seals on Shaft Bearings

- Pursuing replacement of the seals/bearings with a system that will require minimal maintenance.
- Replacing grease lubricated roller bearings and lip seals with seal less oil-bath Babbit type sleeve bearings.

Schedule:

Plans and Specifications	March - May 04
Acquisition Phase	May - June 04
Construction Phase**	September – November 04

**Requires approval from the Fish Agencies to perform construction on the standby pump outside of the normal construction window.

CWE stands at \$315,000. (FY03 dollars)

Appendix, Handout 3 (Continued)

Fish Facility Design Review Work Group Walla Walla District February 25, 2004

Lower Monumental /Little Goose Emergency/Lower Granite - AWS Numerical Hydraulic Modeling

Status:

Numerical Models 100% - Reviewed by COE in last quarter FY03.

- Models indicated that Fishway hydraulic conditions remain in criteria over a fairly broad range using 2 of the 3 turbine pumps and closing one entrance and one diffuser.

Issues:

- Models were calibrated at using physical data collected at one tailwater elevation.
 - Model algorithms and hydraulic coefficients were defined utilizing this one data set.
 - COE personnel are not confident model is predictable over a broad range of tailwater elevations.
- COE proposes to continue with verification of model this spring with physical measurements of fishway criteria at high flows.
 - Physical data sets to be compared with hydraulic model output
- Comparison of physical data and numeric model output
 - If necessary services of NHC will be retained to recalibrate the model over a wider tailwater range
 - Once numerical model and physical data agree COE will pursue use of the numerical model as a viable alternative to the Bi-Op requirement for 1 pump redundancy of the AWS systems at Little Goose and Lower Monumental Projects.

Appendix, Handout 3 (Continued)

**Fish Facility Design Review Work Group
Walla Walla District
February 25, 2004**

**Lower Monumental /Little Goose Emergency/Lower Granite - AWS
Numerical Hydraulic Modeling**

Issues (Cont):

- **Additional Funding Required**
 - Numerical Modeling was scheduled for completion in FY03
 - COE encountered some software operational concerns
 - Scheduled FY03 funding was expended working out the software concerns with the A-E, and becoming proficient in the use of the software.
 - No additional funding was requested in the FY04 budget.

 - Estimate that the following funding will be necessary to complete the model verification for Lower Monumental, Little Goose and Lower Granite Dams.
 - \$25K for Hydraulic Design - Data Collection/Analysis and Report Generation
 - \$5K for PM - Project Tracking and Coordination
 - \$10K Contingency - May need to fund the A-E to refine the Hydraulic Coefficients in the models.

Appendix, Handout 3 (Continued)

**Fish Facility Design Review Work Group
Walla Walla District
February 25, 2004**

**Lower Monumental /Little Goose Emergency/Lower Granite - AWS
Numerical Hydraulic Modeling**

Schedule:

- High Water Data Collection Site Visit #1 May 2004
- High Water Data Collection Site Visit #2 June 2004
- Verify Computer Model Calibrations using collected data June 2004
- Letter Report July 2004
 - Alternatives for proposed operational and/or structural modifications
 - Agency concurrence with the 2 pump operation, along with exceedance curves and acceptable risks.

Budget Estimate:

- \$25K for Hydraulic Design - Data Collection/Analysis and Report Generation
- \$5K for PM - Project Tracking and Coordination
- \$10K Contingency - May need to fund the A-E to refine the Hydraulic Coefficients in the models.

\$6.6M for new pumping plant. Possible to reprogram funds to replace aging equipment with some upgrade in pumping reliability and system operation.

Appendix, Handout 4

LOWER MONUMENTAL PARAPET WALLS ALTERNATIVES AND COST ANALYSIS

February 23, 2004

Description of Problem

New wave actions resulting from the installation of deflectors in spillbays one and eight have created conditions producing water columns and spray which, in turn, saturate the north and south shore tailrace decks. Fish passage spill patterns for 2003 were modified to minimize flow onto the tailrace decks. For future use, parapet walls have been suggested to maximize use of spillbays one and eight for higher flows. The reduction of spray, prevention of direct flow caused by water columns and wave surges will be the design criteria for the parapet walls.

Background

Water on the Lower Monumental tailrace decks was noticed during the 2003 spill season. It was determined that the installation of the flow deflectors earlier that year modified the flow characteristics of the spill in bays one and eight. The new flows from bays one and eight produced large primary and secondary waves immediately upon entry into the tailrace. These standing waves created conditions that saturated the tailrace decks with spray and splash. Fish passage issues were raised when juvenile and adult salmon were discovered on the south shore tailrace deck. Other concerns raised included the maintenance of electrical equipment and worker safety on the tailrace decks.

To address the issues, flow was varied in bays one and eight until flow reaching the tailrace deck was reduced to prevent juvenile fish from entrapment. Spray and saturation of the decks were also reduced as a result of modifying the spill pattern. It was agreed that the maximum of two stops would be allowed for the 2003 spill season for bays one and eight. It was noted that to fully maximize flow potential for the end bays, a wall was needed to block water from splashing onto the tailrace decks. Higher flows typical of involuntary spill were observed in order to identify flow characteristics, which produced water columns and splash well above the tailrace decks.

Hydraulic Analysis

To develop a recommendation on parapet wall length and height, hydraulic engineers from the district reviewed video recorded during the 2003-spill season. Video was recorded for flows ranging from 2.8 to 11.3 kcfs, 1.9 to 7 stops respectively. The flows have a set tailwater of 445 (msl) and show different deflector flow performance characteristics for the varying flow. After reviewing the video a trip to observe the general model of Lower Monumental at ERDC was arranged to run further conditions having set discharges and varied tailwater. Flows for bays one and eight had a tailwater range of 447 to 451 (msl) with set flows of 10 and 20 kcfs per bay. Combining the results from video recorded during the 2003 spill season and observations from the general model led to the initial recommendation of parapet wall heights of 10 feet. This recommended height prevents direct flow onto tailrace decks at all observed flows and would also reduce the amount of spray entering the areas of concern.

Alternative 1

Upon return to the district, a meeting was held to discuss progress on parapet wall development and to finalize recommendations. Those in attendance included fishery biologists, hydraulic engineers, and the project foreman. From the meeting it was agreed that a 10-foot wall height would be sufficient for fish and maintenance requirements. A full wall length of 220 feet on the south tailrace deck was recommended with a change in height from 10 feet to 6 feet at approximately two-thirds the distance of the wall. A wall of 10 feet was also agreed upon on the north tailrace deck for the entire length of the powerhouse for a 100-foot length. It was also

Appendix, Handout 4 (Continued)

suggested to remove the unused juvenile outfall pipe on the 76.5-foot training wall and pour a crested high strength concrete cap onto the top of the training wall. The high strength concrete will help eliminate erosion from wave action and shed water and fish landing on the training wall. It was also noted that fish entrances SPE3 and SSE3 might need concrete bulkheads to support the additional dead load created by the walls. Further structural analysis found that this was not the case however there may be some operational preferences for installing permanent bulkheads or filling the gate slot with concrete. The walls themselves need to withstand static loading of a standing wave the full height of the wall. The north and south tailrace walls should be designed for heightening if future conditions prove for a need. The top of the wall should be suited to implement temporary panelized structures for high tailwater/flow events to reduce heavy spray on the decks.

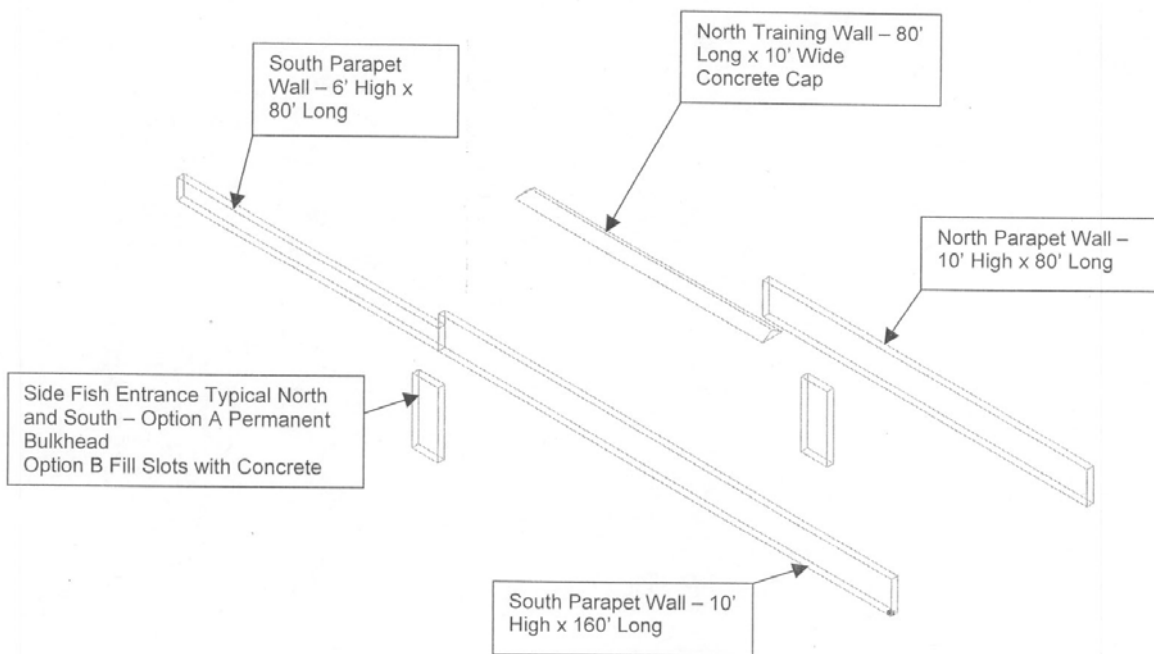


Figure 1 – Isometric of Alternative 1

Costs.

- Cost of Alternative 1 assuming that no modifications are needed to the north and south side fish entrances is \$184,000 (*plus revised cap cost*).
- Cost of Alternative 1A which assumes that all work in Alternative 1 is required, that permanent bulkheads will be installed in the north and south side fish entrances, and that all demolition to remove existing gate and hoisting equipment is performed is \$297,540 (*plus revised cap cost*).

Appendix, Handout 4 (Continued)

- Cost of Alternative 1B which assumes that all work in Alternative 1 is required, that the north and south side fish entrances gate slots will be filled with concrete, and that all demolition to remove existing gate and hoisting equipment is performed is \$331,080 (*plus revised cap cost*).

Alternative 2

Alternative 2 was costed out to include the 10'-high by 160'-long and 6'-high by 80'-long south parapet wall and the 10'-high by 80'-long north parapet wall. For this alternative it is assumed that no training wall cap will be required on the north side.

Costs.

- Cost of Alternative 2 assuming that no modifications are needed to the north and south side fish entrances is \$162,160.
- Cost of Alternative 2A which assumes that all work in Alternative 2 is required, that permanent bulkheads will be installed in the north and south side fish entrances, and that all demolition to remove existing gate and hoisting equipment is performed is \$275,700.
- Cost of Alternative 2B which assumes that all work in Alternative 2 is required, that the north and south side fish entrances gate slots will be filled with concrete, and that all demolition to remove existing gate and hoisting equipment is performed is \$309,240.

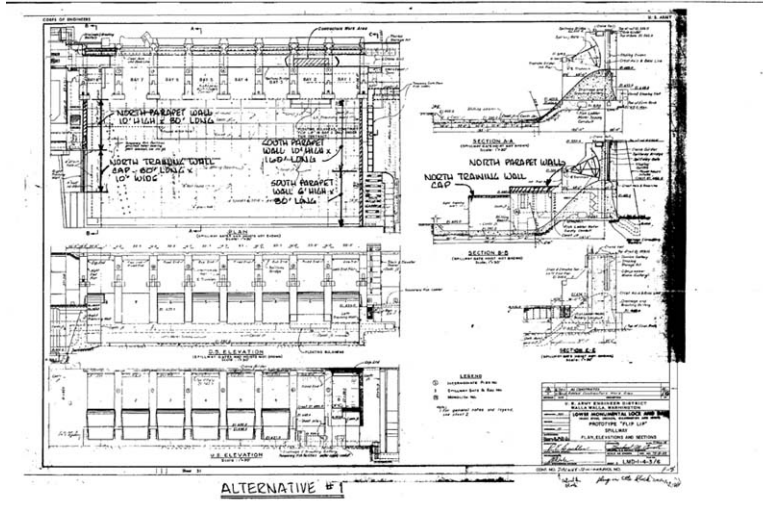
Alternative 3

Alternative 3 was costed out to include the 10'-high by 160'-long and 6'-high by 80'-long south parapet wall and a 10'-high by 80'-long north parapet wall along the powerhouse deck with a 17'-high by 80'-long parapet wall on top of the training wall (in lieu of a cap).

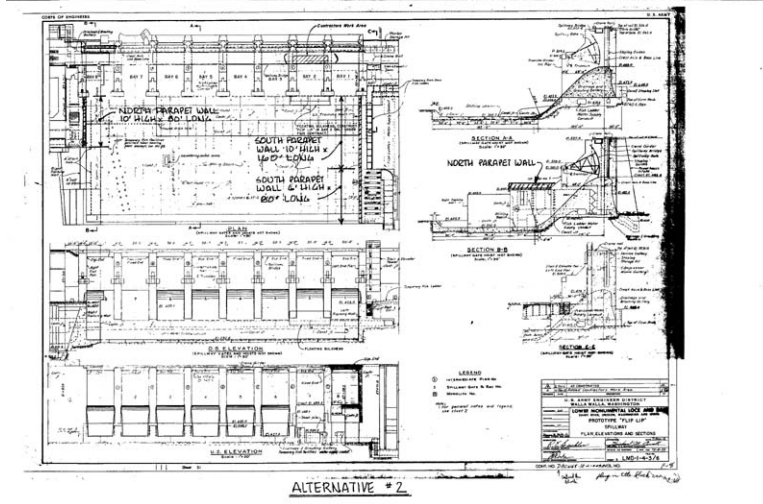
Costs.

- Cost of Alternative 3 assuming that no modifications are needed to the north and south side fish entrances is \$237,620.
- Cost of Alternative 3A which assumes that all work in Alternative 3 is required, that permanent bulkheads will be installed in the north and south side fish entrances, and that all demolition to remove existing gate and hoisting equipment is performed is \$351,160.
- Cost of Alternative 2E which assumes that all work in Alternative 2 is required, that the north and south side fish entrances gate slots will be filled with concrete, and that all demolition to remove existing gate and hoisting equipment is performed is \$384,700.

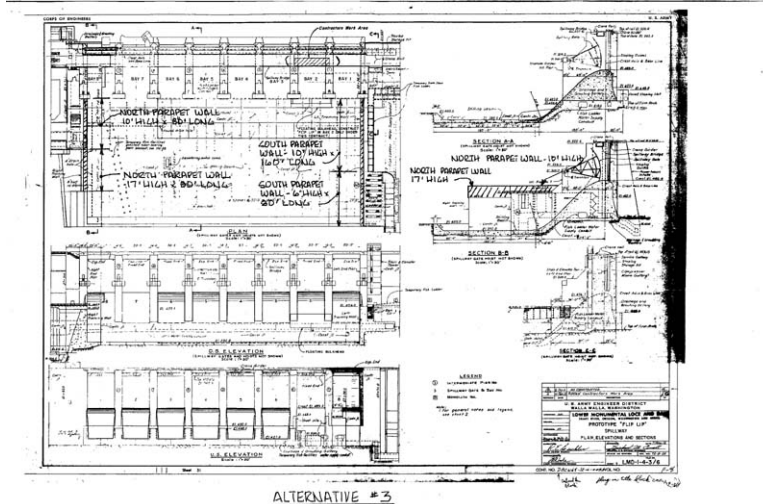
Appendix, Handout 4, Alternates
Alternate 1



Alternate 2



Alternate 3



Appendix, Handout 5a

McNary 1%

February 2004
Project Manager: Mark Smith

McNary 1%

Project Summary: BPA has requested removal of the 1% peak efficiency turbine operating restriction at McNary Dam for the duration of the juvenile fish out migration. The proposed increase in turbine discharge will affect the overall project hydraulics by decreasing the amount of involuntary spill throughout the year and increasing the flows through the extended length diversion screens, turbines and gatewell environment. It is unknown what the overall affect this change will have on project survival. A monitoring plan is being developed to help reduce the likelihood that this change in operation will have a negative impact to juvenile fish survival through McNary Dam.

The main goal of the monitoring plan is to reduce the risk of this operation by identifying decision criteria and reporting process to allow for efficient in-season management regarding the continuation of this operation.

Summary of Feb 11, FFDRWG meeting:

Issues were broken into to areas of concern that warranted monitoring for an after action summary and into those concerns that need to be monitored for in-season management decisions.

Spring Operation

1. Seasonal monitoring:

- a. Reduction of involuntary spill / decreases FPE: Report on the frequency of occurrence that involuntary spill was avoided.
- b. Forebay delay – A direct comparison will not be possible without a control. Document forebay residence time observed in the radio tagged fish.
- c. Change to FGE - This will be monitored seasonally with hydroacoustics in 5 units. A request has been made to try and correlate FGE to the VBS criteria/or head differential.
- d. Turbine Survival (and immediate tailrace) – Composite turbine survival will be monitored over the season with RT.
- e. Tailrace passage time and survival – Again this will be a season composite because there are no direct releases proposed.
- f. Extended Screen velocities – This is not a concern at this time. Video monitoring was discussed but not clarified.
- g. VBS Impingement – Document species and number of fish on screen being cleaned and monitor with video camera.
- h. High temperature and gradients – Monitor in the fish facility as usual and follow Fish Passage Plan guidance.
- i. Total dissolved Gas – Continue routine monitoring and document results at the end of the season.
- j. Other Species Monitoring
 - Fry impingement – Document fry on screens being cleaned and through the use of video cameras.

Appendix, Handout 5a (Continued)

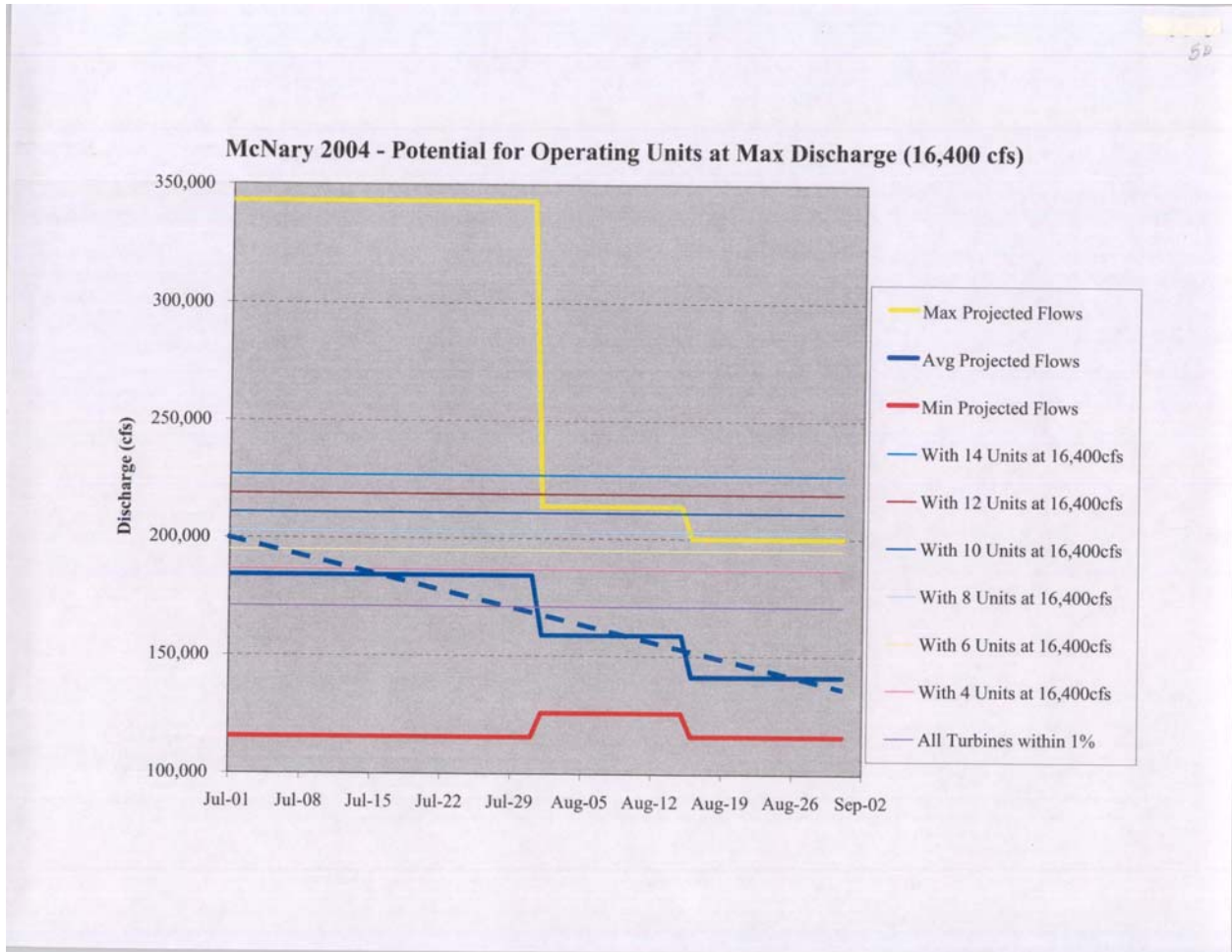
McNary 1%

- Kelt Condition – Document numbers and condition and compare to previous years.
 - Lamprey – Monitor numbers and impingement.
2. In-Season Monitoring -Gateway Environment
- a. Impingement, and turbulence-debris interactions are one of the major concerns. This will be monitored with descaling and mortality criteria. A two stage criteria for the "every-other day" sample will be developed based on the historic data sets. COE will summarize descaling data for a discussion of potential criteria threshold.
 - At the lower criteria, project personnel will first inspect the facility to confirm no other problems exist, review the descaling data from the ongoing PIT tag evaluation in the 5 test units and finally check upstream fish condition from other projects on the Snake and Columbia River before turbine operation is returned to within the 1% operating range. This will result in the project operating a minimum of 3 days under higher descaling because of the current every other day sampling schedule. A weekly summary will be emailed from the project.
 - The second criteria, of a higher descaling level, will result in an immediate return of turbine operation to within the 1% operating range.
 - b. Debris – Monitoring will be conducted visually and with radar sensors mounted on 15 VBSs to detect a head differential of 1.5 feet. The visual monitoring was proposed for once a shift during daylight. The radar sensors can be programmed to report in 5 minute increments. Once reported, the blocked VBS will be cleaned in accordance with the FPP. Note there has been a recent request to FPOM to change the salvage operation. The number of VBS cleaning will be documented and a rough estimate of fish diverted to the turbines during the cleaning operation will be reported.
 - A revision to the PIT tag evaluation was proposed to eliminated the preseason test and used the tagged fish for evaluation of fish condition on days or event of high debris loads.
 - c. Passage time – Will be document in the fish condition evaluation, no in-season management criteria was proposed at this time.

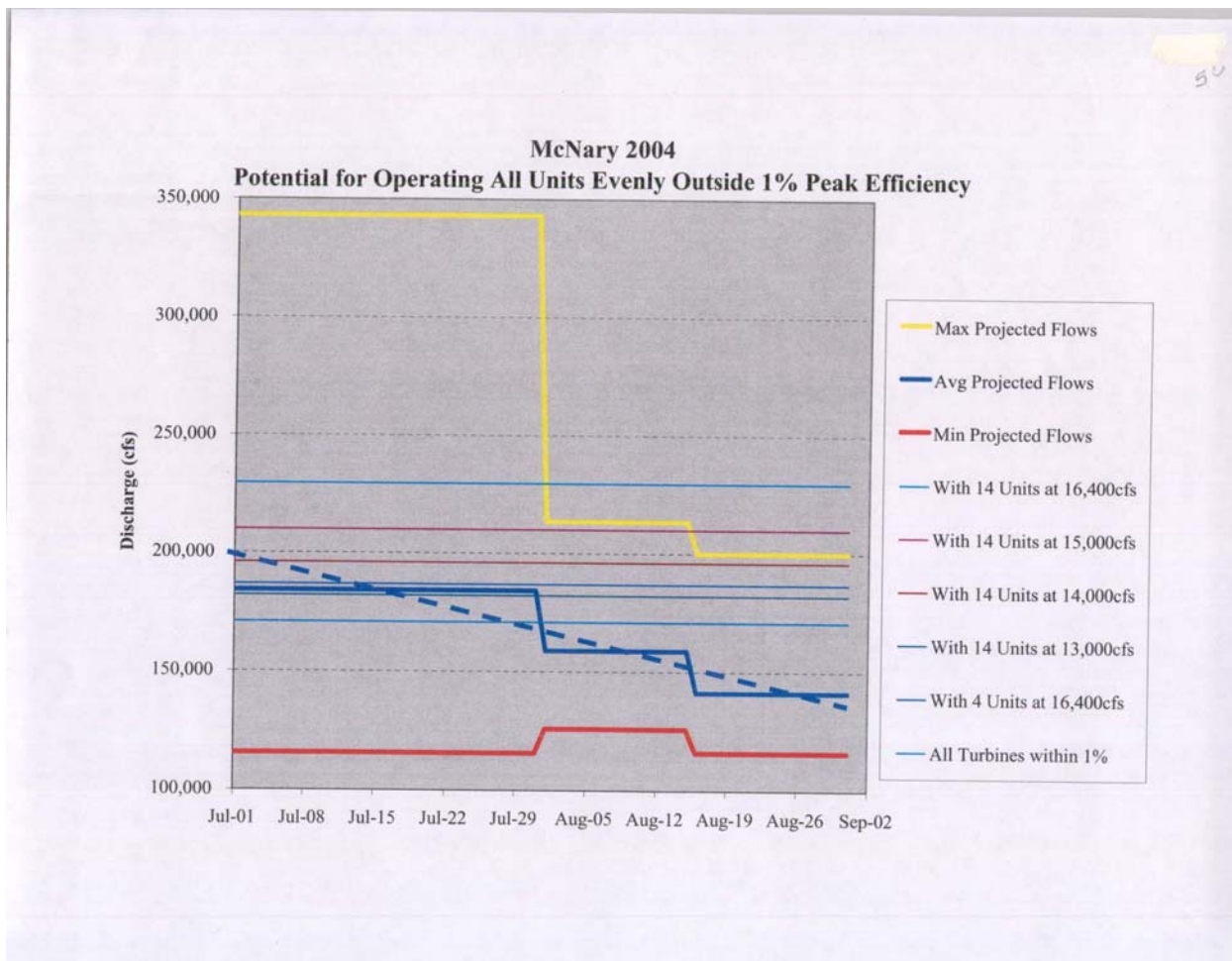
Summer Operation - The group did not come to an consensus on potential summer criteria because of the concern that the descaling criteria proposed for the summer would be insufficient to detect fish in temperature stress before they entered the facility. The risk is of episodic events similar to that which occurred at McNary in 1994.

1. Termination criteria - was proposed using the same criteria for the start of the summer transport operation was proposed (below 220-260K in the river and above 62 degrees).
2. Requested clarification from BPA on the intent in the summer and information on how 1% will occur in flows are below involuntary spill levels.

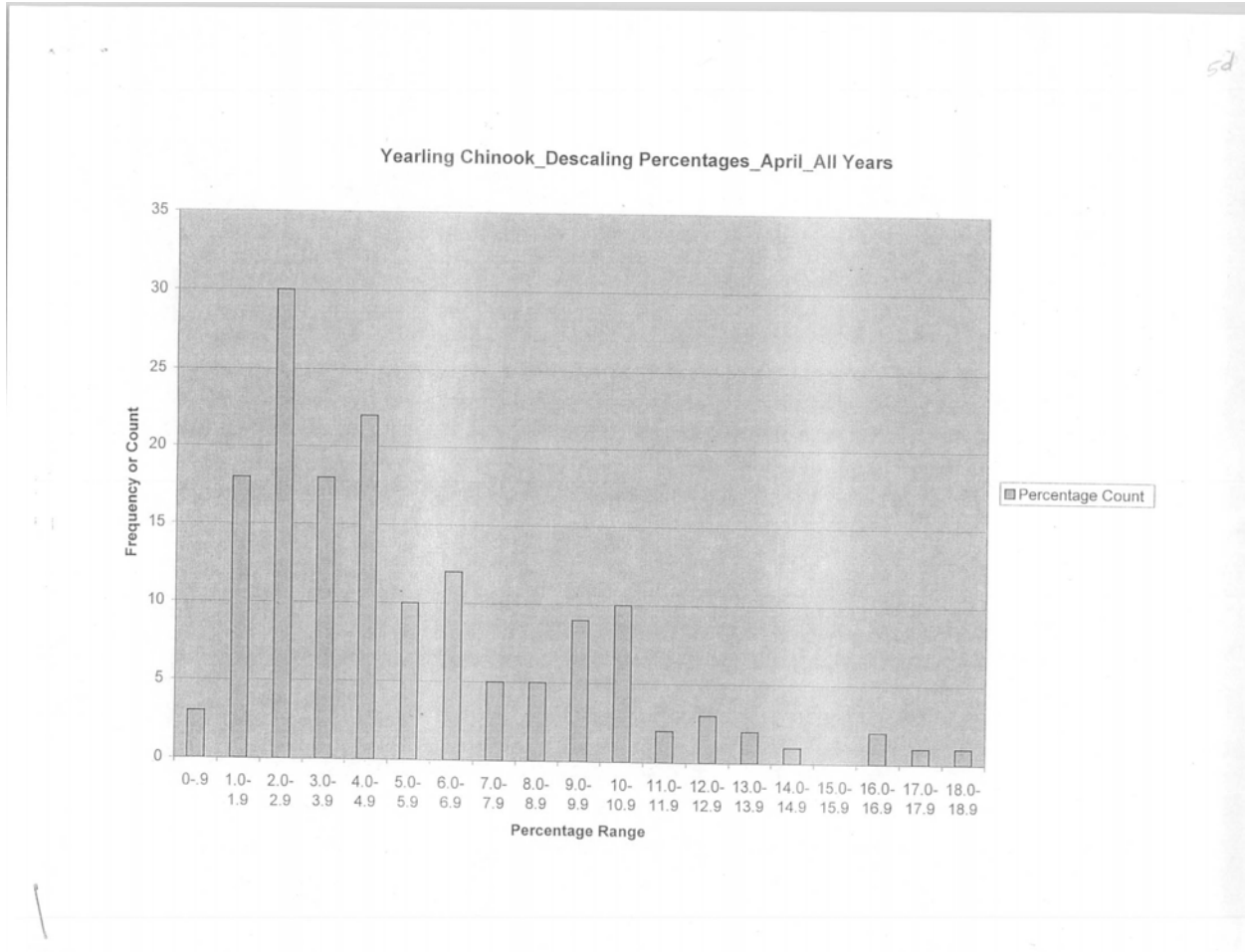
Appendix, Handout 5b



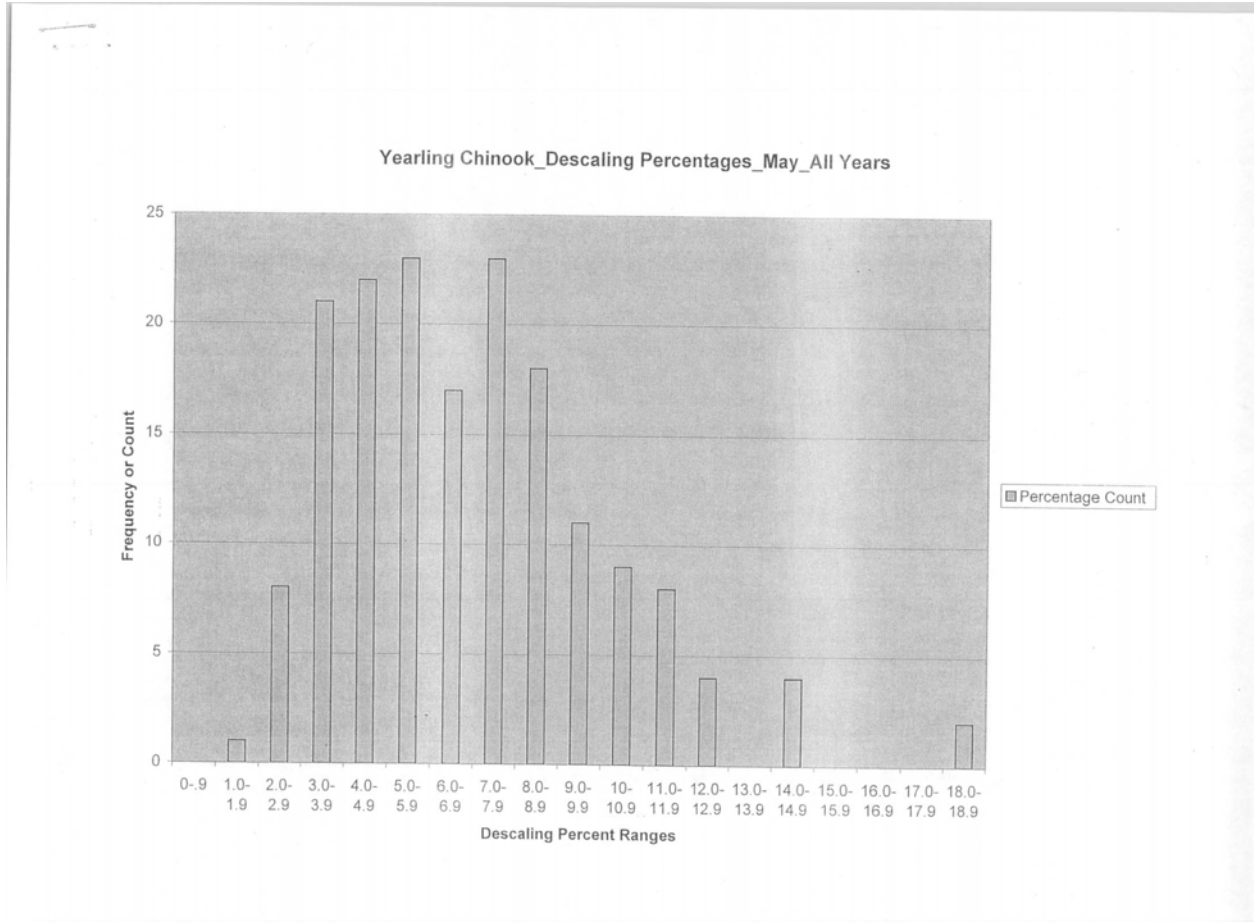
Appendix, Handout 5c



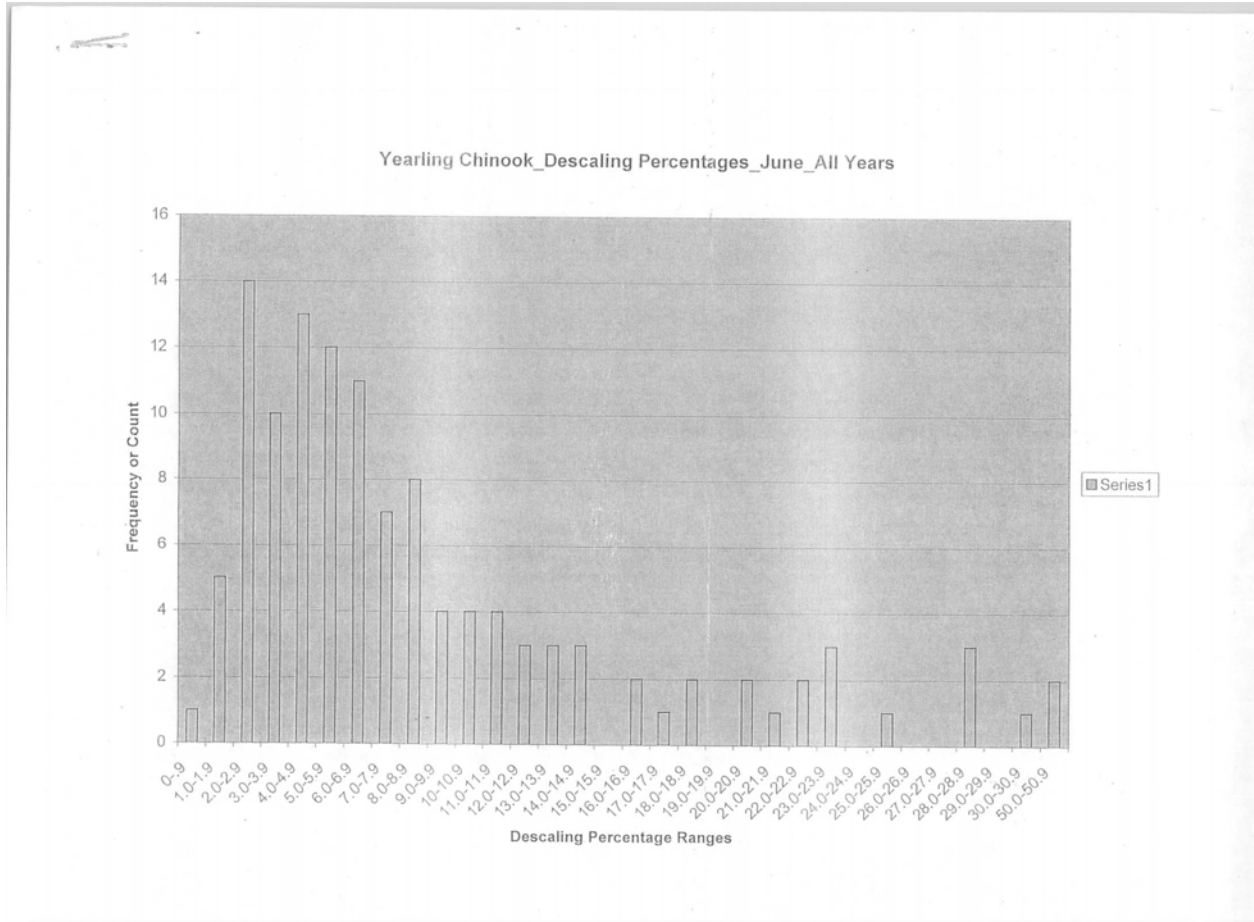
Appendix, Handout 5d



Appendix, Handout 5d (Continued)

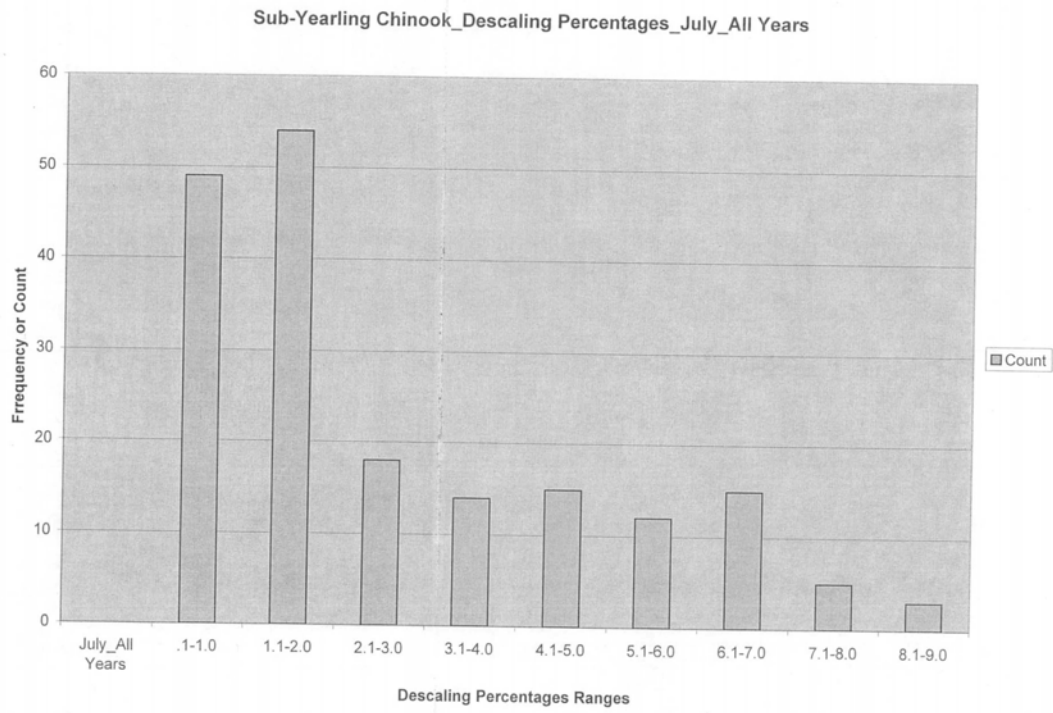


Appendix, Handout 5d (Continued)



Appendix, Handout 5e

5e



High Velocity Separation at Ice Harbor

Gist of the situation

In the last couple of weeks, I've talked to the two people that have the most knowledge about high velocity separation (Dan Katz and Lynn McComas) and have explained my concerns of what we know, and what additional testing at Ice Harbor will give us.

They both agree that we have tested the "parts and pieces" of the high velocity separator (juvenile separation, adult separation, trash and debris) as individual units, and everything seems to work satisfactorily. What is now required is testing of the "whole unit", and the logical place to test this (besides Lower Granite Dam) is at Lower Monumental Dam.

Appendix, Handout 6 (Continued)

QUESTIONS / CONCERNS

If we go ahead with the planned testing at Ice Harbor in 2004 will we answer the basic questions concerning high density juvenile separation?

Don't really know the answer to this.....primarily because what we can test at Ice Harbor is still just a part of the anticipated system. **We cannot test high density juvenile separation and the bars used for adults/debris separation at Ice Harbor with the present configuration, and we cannot revamp the system to do this test in 2004.**

If we conducted the study as proposed for 2004 -We still won't know what/if any effect the adult bars might have on juveniles.....do they just move right thru without separating? Is there a delay? With the higher velocity and some trash are the juveniles more susceptible to injury (no matter what type of separator is used it will still require personnel to remove some trash and keep the system "operational") Higher flows mean less time to react, which may lead to different types of problems.

Other questions with the 2004 proposal - where and how the transported fish should be released.....and we won't have these answers until we do some of the tests.

Do transported fish behave differently? Can't really answer this question, but past studies have used transported fish so we should be able to continue using this methodology.

What is "high density"

Is it better to use "naive fish"those that have not encountered a juvenile separator (gatewell dipping at Lower Granite Dam).....maybe, but we still need to test the entire system...(adult/trash bars and juvenile separation)

ESA concerns.....

Money has been appropriated.....what to do

Dan Katz has mentioned some debris work that could be done at Ice Harbor this late summer or fall (2004).....need more input from Dan, but NMFS Pasco should be able to construct the necessary bars and do the testing at that time. Remainder could go toward design/materials for the prototype.

Appendix, Handout 7

February 2004
Project Manager: Rebecca Kalamasz

Major Systems Improvements Analysis Columbia Fish Mitigation Program Mitigation Analysis

Study/Project Summary: The Major Systems Improvements Decision Analysis (MSIDA) is the District's plan for evaluating and prioritizing fish passage technology and operation configurations for McNary and the Snake River Dams to meet the performance measures of the 2000 Biological Opinion (BiOp) while considering cost, power and water quality.

Sponsor and Purpose: The Walla Walla District sponsored this project to continue the analysis started in the Lower Snake River Feasibility Study for the recommended alternative; Major System Improvements. While this alternative provided the greatest flexibility to switch between in-river migration and transportation strategies as conditions warranted; the details were intended to be refined as new information became available. The MSIDA evaluates the new data with respect to both biology and performance of new operations and prototype construction and provides the justification for the annual prioritization of actions to the Columbia River Fish Mitigation Program and other programs where appropriate.

Status:

1. Ice Harbor Analysis - To aid the District in making a decision regarding the proposed acceleration of construction of the removable spillway weir (RSW) at Ice Harbor by 2005. Various configurations of RWS, BGS, extended screens and other structural improvements were evaluated and compared to a range of operational alternatives feasible at Ice Harbor.

Analysis - Completed Dec 2003

- In summary, 35 operations and 7 construction actions were evaluated incrementally and in combination for impacts to project survival for spring and fall chinook. Data used in the analysis was from the Joint Data Review Team meeting in October 2003. Based on input from the region, some of the alternatives were removed during the evaluation (divider walls, high velocity RSWs and multiple RSWs). This resulted in about 1,200 alternatives for spring Chinook and about 900 for fall Chinook. Results of the analysis showed that project survival for the RSW alternatives were as high as or better than the spill alternatives for both spring and fall Chinook. The conclusion was that the RSW's potential range of operation makes it a viable option based on project survival.

Report - Still in draft.

2. System Analysis - To identify, select and prioritize preferred configurations of fish passage technology and operations for the CRFMP (Snake River and McNary Dams). Based on the lessons learned from the Ice Harbor Analysis the scope, schedule and costs are being re-evaluated. A decision on the revised plan will be made in early March.

Appendix, Handout 7 (Continued)

MSIDA Results for Ice Harbor Range of Project Survival			
Alternative	Percent Project Survival		CRFMP Cost
	Spring Chinook	Fall Chinook	
Spill Only Operations	90.01 - 98.91	89.07 - 97.49	\$ - - \$ 103.30
RSW Spill Operations	96.32 - 98.88	96.22 - 99.25	\$ 15.00 - \$ 121.00
Bypass Operations	94.70 - 98.27	94.02 - 97.43	\$ - - \$ 96.70
High Flow RSW Spill Operations	97.01 - 98.91	96.87 - 99.35	\$ 15.00 - \$ 121.00
Multiple RSW Spill Operations	96.78 - 98.95	96.86 - 99.45	\$ 30.00 - \$ 109.40

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Appendix, Handout 7 (Continued)

MSIDA Results for Ice Harbor Range of Project Survival					
Number	Alternatives	Total Spill	Percent Project Survival	Percent Project Survival	CRFMP Cost
<i>Spill Only Operations</i>		Spring/Summer	Spring Chinook	Fall chinook	
A1Low	BiOp Traditional Spill Pattern	day 45K, night 100%/ 45K 24hrs.	90.01 - 92.85	- - -	\$ - - \$ 70.70
A1Mid	BiOp Traditional Spill Pattern	day 45K, night 100%/ 45K 24hrs.	94.95 - 97.94	89.32 - 92.05	\$ - - \$ 96.70
A1High (A3)	BiOp Traditional (Bulk*) Spill Pattern	day 45K, night 100%/ 45K 24hrs.	97.41 - 98.91	95.94 - 96.99	\$ 6.60 - \$ 103.30
A5	110% Gas Cap with Bulk Spill Pattern *	30K	96.60 - 98.79	95.77 - 96.99	\$ 6.60 - \$ 89.80
<i>RSW Spill Operations</i>					
A14	Low RSW Flows (7K) no Training Spill	7K	96.32 - 98.75	96.43 - 98.76	\$ 15.00 - \$ 94.40
A9B	Low RSW Flows (7K), 12K Training Spill	19K	96.44 - 98.80	96.22 - 98.26	\$ 15.00 - \$ 97.80
A7	Low RSW Flows (7K), 20K Training Spill	27K	96.71 - 98.81	96.56 - 98.46	\$ 21.60 - \$ 121.00
A37Low	Low RSW Flows (7K), 30K Training Spill	37K	96.91 - 98.84	96.63 - 98.35	\$ 21.60 - \$ 121.00
A37Mid	Low RSW Flows (7K), 35K Training Spill	42K	97.01 - 98.85	- - -	\$ 21.60 - \$ 121.00
A37High	Low RSW Flows (7K), 40K Training Spill	47K	97.11 - 98.88	- - -	\$ 21.60 - \$ 121.00
<i>Bypass Operations</i>					
A33	Bypass, Night BiOp Spill	night 100%	96.82 - 98.27	95.62 - 96.98	\$ - - \$ 96.70
A34	Bypass, No Spill	0	94.70 - 96.79	94.02 - 96.26	\$ - - \$ 52.70
<i>High Flow RSW Spill Operations</i>					
A13	High RSW Flows (10K) no Training Spill	10K	97.01 - 98.85	97.08 - 98.86	\$ 15.00 - \$ 94.40
A8	High RSW Flows (10K), 12K Training Spill	22K	97.02 - 98.76	96.86 - 98.48	\$ 15.00 - \$ 97.80
A6	High RSW Flows (10K), 20K Training Spill	30K	97.41 - 98.91	97.20 - 98.63	\$ 21.60 - \$ 121.00
<i>Multiple RSW Spill Operations</i>					
A12	Two Low RSW Flows (7K each)	14K	96.78 - 98.82	96.78 - 98.83	\$ 30.00 - \$ 109.40
A10	Two High RSW Flows (10K each)	20K	97.67 - 98.95	97.69 - 98.95	\$ 30.00 - \$ 109.40

* Unknown risks associated with Bulk Operation

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Appendix, Handout 7 (Continued)

Spring Chinook MSIDA Results							
Project Survival Summary for Specific Alternatives							
Number	Alternatives	Total Spill	Project Survival				
			Base case	Ex-Screens	BGS	Spillway Improvements	Turbine Improvements
<i>RSW Spill Operations</i>							
A14	Low RSW Flows (7K) no Training Spill	7K	96.32	96.99	97.63	96.81	96.62
A9B	Low RSW Flows (7K), 12K Training Spill	19K	96.44	97.06	97.66	96.45	96.72
A7	Low RSW Flows (7K), 20K Training Spill	27K	96.71	97.20	97.72	96.83	96.95
A37	Low RSW Flows (7K), 30K Training Spill	37K	97.11	97.47	97.80	97.35	97.27
<i>Spill Only Operations</i>							
A1Low	BiOp Traditional Spill Pattern	day 45K, night 100%	90.01	90.25	89.22	92.48	90.12
A1Mid	BiOp Traditional Spill Pattern	day 45K, night 100%	94.95	95.18	94.99	97.41	95.05
A1High (A3)	BiOp Traditional (Bulk*) Spill Pattern	day 45K, night 100%	97.41	97.65	98.87	98.23	97.52
A5	110% Gas Cap with Bulk Spill Pattern *	30K	96.60	97.16	97.69	97.18	96.86
<i>Bypass Operations</i>							
A33	Bypass, Night BiOp Spill	night 100%	96.82	97.29	96.92	97.46	97.04
A34	Bypass, No Spill	0	94.70	96.02	-	-	95.30

* Unknown risks associated with Bulk Operation

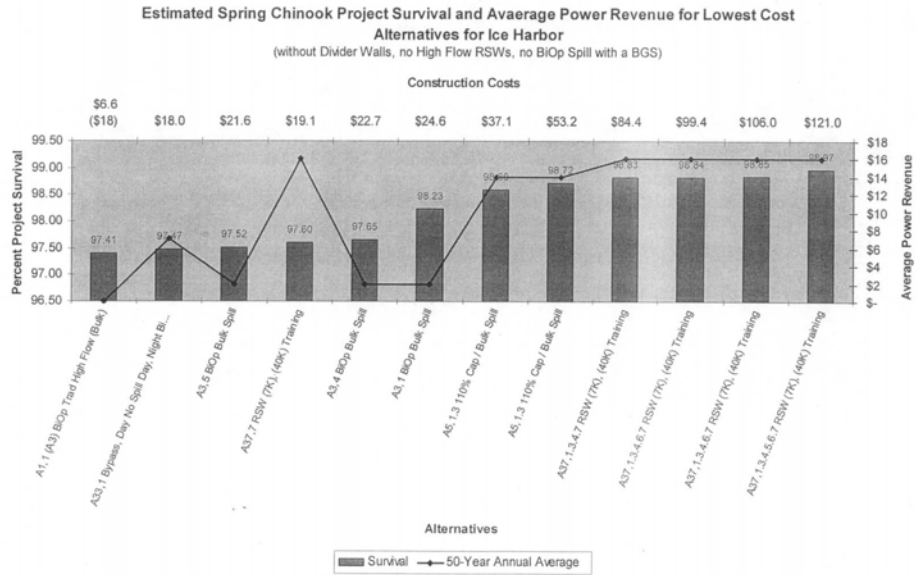
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Appendix, Handout 7 (Continued)

Fall Chinook MSIDA Results for Ice Harbor Project Survival Summary For Specific Alternatives							
Number	Alternatives	Total Spill	Project Survival				
			Basecase	Ex-Screens	BGS	Spillway / RSW Outfall Improvement	Turbine Improvement
<i>RSW Spill Operations</i>							
A14	Low RSW Flows (7K) no Training Spill	7K	96.43	97.11	97.65	96.92	96.90
A9B	Low RSW Flows (7K) 12K Training Spill	19K	96.22	96.85	97.12	96.75	96.66
A7	Low RSW Flows (7K) 20K Training Spill	27K	96.56	97.08	97.37	97.05	96.92
A37	Low RSW Flows (7K) 30K Training Spill	37K	96.63	97.06	97.27	97.12	96.93
<i>Spill Only Operations</i>							
A1	BiOp Traditional Spill Pattern	45K 24 hrs	89.32	89.39	89.07	92.16	89.37
A3	BiOp Traditional (Bulk*)Spill Pattern	45K 24 hrs	95.94	96.01	95.98	96.88	95.99
A5	110% Gas Cap with Bulk Spill Pattern*	30K	95.77	96.05	95.95	96.57	95.97
<i>Bypass Operations</i>							
A33	Bypass, Night BiOp Spill	Night 45K	95.62	96.09	95.65	96.26	95.95
A34	Bypass, No Spill	0	94.02	95.58	-	-	94.94

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Appendix, Handout 7 (Continued)



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Appendix, Handout 7 (Continued)

Ice Harbor Alternatives								
Spring Chinook Project Survival with Total Construction Costs								
Lowest Cost Alternatives per Increase in Project Survival (without Divider Walls, High Flow RSWs, or BiOp with BGS options)								
Alternatives				Survival	Dissolved Gas	Cost	Power revenue (million)	
Operation	Number	Combination of Construction Improvements	Numbers	Project	Percent Time Above 110%	Total Construction	50-Year Annual Average	Range of Revenue
BiOp Traditional High Flow (Bulk) Spill Pattern	A3 (A1)	Spillway Improvements	0 (1)	97.41	100% (50%)	\$6.6 (\$18)	\$2 (\$0)	\$0-1 (\$0)
Bypass, No Spill Day BiOp/Bulk Night	A33	Spillway Improvements	1	97.47	68%	\$18.0	\$ 7	\$5-8
BiOp Bulk Spill Pattern	A3	Turbine Improvement	5	97.52	100%	\$21.6	\$ 2	\$0-2
RSW Flows (7K) with High Training Spill (40K)	A37	Spillway Improvements	7	97.60	0%	\$19.1	\$ 16	\$6-22
BiOp Bulk Spill Pattern	A3	Ex-Screens	4	97.65	100%	\$22.7	\$ 2	\$0-2
BiOp Bulk Spill Pattern	A3	Spillway Improvements	1	98.23	100%	\$24.6	\$ 2	\$0-2
110% Cap with Bulk Spill Pattern	A5	Spillway Improvements and BGS	1.3	98.60	0%	\$37.1	\$ 14	\$6-17
110% Cap with Bulk Spill Pattern	A5	Spillway Improvements, BGS and Ex-Screens	1.3.4	98.72	0%	\$53.2	\$ 14	\$6-17
RSW Flows (7K) with High Training Spill (40K)	A37	Spillway Improvements, BGS, Ex-Screens and RSW Outfall Improvements	1.3.4.7	98.83	100%	\$84.4	\$ 16	\$6-22
RSW Flows (7K) with High Training Spill (40K)	A37	Spillway Improvements, BGS, Ex-Screens, Turbine Improvements and RSW Outfall Improvements	1.3.4.5.7	98.84	100%	\$99.4	\$ 16	\$6-22
RSW Flows (7K) with High Training Spill (40K)	A37	Spillway Improvements, BGS, Ex-Screens, Fish Facility Improvements and RSW Outfall Improvements	1.3.4.6.7	98.85	100%	\$106.0	\$ 16	\$6-22
RSW Flows (7K) with High Training Spill (40K)	A37	Spillway Improvements, BGS, Ex-Screens, Turbine Improvements, Fish Facility Improvements and RSW	1.3.4.5.6.7	98.97	100%	\$121.0	\$ 16	\$6-22

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