



Second Initial Study Results Meeting Summary

Project:	Loup River Hydroelectric Project FERC Project No. 1256		
Subject:	Second Initial Study Results Meeting Summary		
Meeting Date:	February 23, 2011, 9:30 am – 5:00 pm and February 24, 2011, 8:00 am – 12:00 pm	Meeting Location:	New World Inn, Columbus, NE
Notes by:	Loup Power District		

Loup River Public Power District (Loup Power District or the District) filed its Second Initial Study Report (Second ISR) with the Federal Energy Regulatory Commission (FERC) on February 11, 2011, as part of relicensing the Loup River Hydroelectric Project (FERC Project No. 1256) and in accordance with the regulations of FERC’s Integrated Licensing Process (ILP) (18 Code of Federal Regulations [CFR] 5). Subsequently, the Second Initial Study Results were presented to FERC and other relicensing participants during the Second Initial Study Results Meeting held on February 23-24, 2011, at the New World Inn (265 33rd Street) in Columbus, Nebraska. The proceedings of that meeting are presented in this Second Initial Study Results Meeting Summary, which follows the organization of the agenda for the meeting.

The meeting agenda and handout of the slide presentation are included as Attachments A and B, respectively.

Welcome and Introductions

Neal Suess (Loup Power District) and Stephanie White (HDR) provided those attending the Second Initial Study Results Meeting with an overview of the agenda and the goals for the meeting. The meeting goals and the list of attendees are provided below.

Meeting Goals

The goals of the Second Initial Study Results Meeting were the following:

- To present the remaining results of the studies identified in the Revised Study Plan and Study Plan Determination.
- To discuss any proposals to modify the study plan (by the District or other participants) in light of study progress and data collected.

Attendees:

The following agency and District representatives attended the Second Initial Study Results Meeting:

February 23, 2011

Name	Organization	Name	Organization
Jason Buss	CART	Mike Gutzmer	New Century Environmental LLC
John Bender (via phone)	NDEQ		
Shuhai Zheng	NDNR	Roger Kay	USACE
Frank Albrecht	NGPC	Robert Cerv	Loup Power District
Richard Holland	NGPC	Rick Cheloha	Loup Power District
Joel Jorgensen (via phone)	NGPC	Bob Clausen	Loup Power District
Michelle Koch	NGPC	Jim Frear	Loup Power District
Jeff Schuckman	NGPC	Charles Gonka	Loup Power District
Jim Jenniges	NPPD	Theresa Petr	Loup Power District
John Shadle	NPPD	Neal Suess	Loup Power District
Randy Thoreson	NPS	Ted Thieman	Loup Power District
Ann Bleed	UNL	Ron Ziola	Loup Power District
Chris Thompson	UNL	Quinn Damgaard	HDR
Tom Econopouly	USFWS	Pat Engelbert	HDR
Robert Harms	USFWS	Dennis Grennan	HDR
Jeff Runge	USFWS	George Hunt	HDR
Robert White	Retired CEO Loup Power District	Gary Lewis	HDR
		Melissa Marinovich	HDR
Lee Emery	FERC	Matt Pillard	HDR
Janet Hutzal (via phone)	FERC	Lisa Richardson	HDR
Nick Jayjack (via phone)	FERC	Scott Stuewe	HDR
Isis Johnson (via phone)	FERC	Wendy Thompson	HDR
Paul Makowski (via phone)	FERC	George Waldow	HDR
		Stephanie White	HDR

February 24, 2011

Name	Organization	Name	Organization
John Bender (via phone)	NDEQ	Mike Gutzmer	New Century Environmental LLC
Shuhai Zheng	NDNR		
Frank Albrecht	NGPC	Bob Clausen	Loup Power District
Richard Holland	NGPC	Jim Frear	Loup Power District
Joel Jorgensen	NGPC	Theresa Petr	Loup Power District
Michelle Koch	NGPC	Neal Suess	Loup Power District
Jeff Schuckman	NGPC	Ron Ziola	Loup Power District
Jim Jenniges	NPPD	Pat Engelbert	HDR
John Shadle	NPPD	Dennis Grennan	HDR
Randy Thoreson	NPS	George Hunt	HDR
Tom Econopouly	USFWS	Gary Lewis	HDR
Robert Harms	USFWS	Melissa Marinovich	HDR
Jeff Runge	USFWS	Matt Pillard	HDR
Lee Emery	FERC	Lisa Richardson	HDR
Isis Johnson (via phone)	FERC	Scott Stuewe	HDR

Name	Organization	Name	Organization
Paul Makowski (via phone)	FERC	Wendy Thompson	HDR
		George Waldow	HDR
		Stephanie White	HDR

Integrated Licensing Process Overview

Lisa Richardson (HDR) discussed the overall relicensing process for the Loup River Hydroelectric Project (Project). She reviewed the previous meetings held to get to this point. She also gave a brief summary of the Study Plan Determination.

FERC issued its Study Plan Determination on August 26, 2009. In the Study Plan Determination, they removed three studies, the deletion of which had already been agreed to by the participating agencies:

- Water Temperature in the Platte River
- Fish Sampling
- Creel Survey

FERC approved three studies without modification:

- Fish Passage
- Land Use Inventory
- Section 106 Compliance

FERC also modified six studies based on agency comments:

- Sedimentation
- Hydrocycling
- Water Temperature in the Loup River Bypass Reach
- Flow Depletion and Flow Diversion
- Recreation Use
- Ice Jam Flooding on the Loup River

The following studies were completed for the Initial Study Report, submitted on August 26, 2010:

- Sedimentation
- Fish Passage
- Recreation Use (Telephone Survey)
- Land Use Inventory
- Section 106 Compliance
- PCB Fish Sampling

FERC's Determination after the Initial Study Results Meeting included:

- Studies Requiring No Revisions:
 - Study 7.0, Fish Passage
 - Study 10.0, Land Use Inventory
 - Study 11.0, Section 106 Compliance
- Studies Requiring Revisions:
 - Study 1.0, Sedimentation
 - Add confidence limits for sediment rating curves.
 - Add aggradation/degradation analysis for Duncan, North Bend, Ashland, and Louisville (from Pre-Application Document [PAD]).
 - Add aggradation/degradation analysis for Genoa.

- Complete the Kendall tau test to assess aggradation/degradation trends.
- Complete additional statistical analysis related to interior least tern and piping plover nesting.
- Provide additional references (Chen et al., 1999, and Missouri River Basin Commission [MRBC] report) to FERC.
- Study 2.0, Hydrocycling
 - Conduct sediment transport analysis using HEC-RAS.

Finally, Richardson briefly discussed the next steps in the process, which include preparation of this Second Initial Study Results Meeting Summary and an opportunity for relicensing participants to submit comments.

Discussion:

- Q: Jeff Runge (USFWS) noted that in the relicensing process, NEPA is the next step. He then asked if this is the last opportunity for agencies to request additional studies and analysis of effects related to alternatives and whether multiple alternatives will be considered in the NEPA analysis.
A: Lee Emery (FERC) responded that this is the last opportunity to request study revisions. When updated studies are filed, agencies will have another opportunity to comment on analysis. Once the application is filed, FERC will perform the NEPA analysis and identify all alternatives.
- Q: Runge also asked if agencies need to identify effects on their resources of concern as well as potential alternatives so that protective mitigation enhancement measures would be incorporated and a range of alternatives would be evaluated.
A: Emery noted that agencies should provide comments and that FERC would incorporate the analysis in its NEPA document.
- Q: Runge asked if requests for protection mitigation enhancement measures should be included in agency comments on the Second Initial Study Report.
A: Emery noted that that is not necessary at this stage of the analysis. Agencies can make recommendations later in the process.
A: Nick Jayjak (FERC) noted that agencies can propose environmental measures and alternatives in their comments on the District's Draft License Application. There will be additional opportunities for recommendations during FERC's environmental analysis.
- Q: Randy Thoreson (NPS) asked about the schedule and deadline for comments on the Second Initial Study Report.
A: Lisa Richardson (HDR) noted that agencies may send in comments anytime between now and April 11.

Presentation of Study Results

Members of the Project team from HDR provided results for the studies that have been completed:

- Study 4.0, Water Temperature in the Project Bypass Reach
- Study 8.0, Recreation Use and Creel Survey
- Study 1.0, Sedimentation Addendum (Ungaged Sites)
- Study 12.0, Ice Jam Flooding on the Loup River
- Study 2.0, Hydrocycling
- Study 5.0, Flow Depletion and Flow Diversion

After the results of each study were given, the other meeting attendees had an opportunity to ask questions and offer comments on the respective studies.

Study 4.0, Water Temperature in the Project Bypass Reach

Study Results:

George Hunt (HDR) presented the study results of the water temperature study. The key points were as follows:

- At Merchiston (upstream) and at Genoa (downstream), there is not a statistically significant relationship between water temperature and flow, water temperature and radiative flux, and water temperature and relative humidity.
- At Merchiston (upstream) and at Genoa (downstream), there is a statistically significant relationship between water temperature and air temperature and between water temperature and soil temperature.
- Synchronous daily oscillations in water temperature are seen between all analyzed stations.
- A statistically significant relationship exists between the recorded water temperatures at the upstream and downstream stations.
- There is a statistically significant relationship between water temperature at Genoa and Columbus.
- Temperature on the Platte River between the Loup River confluence and the Loup Power Canal Tailrace Return is highly correlated with upstream temperature on the Platte River.
- There is not a critical reach in the Project bypass reach.
- The best predictor of a possible excursion was 8 a.m. air temperature.

Discussion:

- Q: Lee Emery (FERC) asked how soil temperature at Monroe was measured.
A: Lisa Richardson (HDR) noted that the District did not do the actual measurements. The soil temperature data came from the Great Plains Climate Center.
- Q: Jeff Runge (USFWS) noted that in the Study Plan Determination, FERC stated that additional temperature monitoring and analysis would need to be conducted on the Platte River if the Platte River bypass reach water temperature was higher than the Loup River bypass reach water temperature and asked why additional monitoring and analysis was not done.
A: George Hunt (HDR) noted that the District used an additional temperature probe upstream on the Platte River and found that temperature in the Platte River bypass reach was related more to temperature in the Platte River upstream of the Loup River confluence than water temperature in the Loup River bypass reach. Therefore, the same analysis was not done. The section of the Platte River is driven by air temperature, and the temperature at the two Platte River locations both tracked together.
- Q: Frank Albrecht (NGPC) noted that the fact that there is no statistical difference for flow versus water temperature was surprising. He noted that the scale on the x-axis on slide 23 shows a significant difference in water temperature at low flows (temperature ranging from 48 to 96 degrees). He also noted that there have been fish kills in this reach. In addition, Runge (USFWS) noted that the regression analysis doesn't separate flows with temperatures above 90, but looks at all the relationships between water and temperature; it does not focus on very low and high temperatures.
A: Hunt noted that this issue was addressed in three ways. First, there are graphs in the report showing flow and temperature for subsets of the data, less than 500 cfs, less than 400 cfs, etc. Second, the same analysis was conducted on just the daily maximums data set. Third, a logistical analysis was completed in which any time the temperature was above 87 or 88 degrees Fahrenheit, a 1 was assigned, and below that, a 0 was assigned to help to reduce the scatter. Hunt also noted that in Appendix C, Study 4.0, graphs on pages 21 to 24 more clearly show the left side of the x-axis. George Waldow (HDR) added that what is shown on the left is all temperature points collected during the summer season, and it is clear that temperature varied greatly for low flows. Hunt added that slide 35 is another way to look at the data. Although flow is higher at Merchiston than Genoa, temperatures plot right on top of each other.

Study 8.0, Recreation Use and Creel Survey

Study Results:

Quinn Damgaard (HDR) presented the study results of the recreation use study. The key points were as follows:

Loup Power Canal Survey Results:

- **General Findings**
 - Size of Party: 1 to 2 = 51%
 - Miles Traveled: 60% traveled 25 miles or less; 92% traveled 100 miles or less
 - Overnight Stays: 35% were staying overnight; 39% were staying for two nights
 - Frequency of Visitation: 2 to 3 times per year
 - Visitation by Month: May, June, July, and August = 66% of visitation
- **Most Common Activity Participation**
 - Fishing from Shore (23.8%); Relaxing/Hanging Out (22.2%); Camping (14.9%); Off-Highway Vehicles (8.7%); wildlife/Scenic Viewing (7.6%); Picnicking (5.2%)
- **Activity Importance (Percentages indicate responses of important or very important)**
 - Relaxing/Hanging Out (79.1%); Fishing (75.8%); Camping (59.0%); Wildlife/Scenic Viewing (58.4%); Picnicking (50.3%); Trails (42.5%)
- **Facility Ratings (Percentages indicate responses of above average or excellent)**
 - Trails (84.7%); OHV Park (83.3%); Campground (72.4%); Swimming Beach (66.4%); Picnic Areas (66.4%)
 - Lowest Rating: Restrooms
- **Requested Improvements**
 - Headworks Park: Additional camper hookups and power in restrooms; showers installed in OHV area
 - Lake Babcock Park: Cleanliness of restrooms; showers installed
 - Lake North Park: Fish cleaning station, fish stocking and structures; cleanliness and showers installed in restroom
 - Columbus Powerhouse Park: Restroom lighting; fish cleaning station
 - Tailrace Park: Restroom installed; general cleanup; fish cleaning station

Loup River Bypass Reach Survey Results

- **General Findings**
 - Size of Party: 1 to 2 = 63%
 - Miles Traveled: 70% traveled 25 miles or less; 90% traveled 100 miles or less
 - Overnight Stays: 22% were staying overnight; 31% were staying for four nights
 - Frequency of Visitation: 48% cite weekly visitation
 - Visitation by Month: May, June, July, and August = 59% of visitation
- **Activity Participation**
 - Relaxing/Hanging Out; Other; Fishing from Shore; Swimming/Wading; Hiking
 - 85% of respondents cite no hindrance to activities
- **Loup Lands WMA – Activity Participation**
 - Hunting; Camping; Fishing from Shore; Wildlife/Scenic Viewing; Relaxing/Hanging Out

Creel Survey Results

- **General Findings**
 - Surveys Conducted: 439
 - Mean Party Size: 1.75
 - Mean Completed Trip Length: 2.9 hours
 - Total Angler Hours: 32,766

- Total Angler Trips: 11,299
- **Fish Species Sought**
 - Channel Catfish (65%); Anything (10%); Walleye/Sauger (9%); Freshwater Drum (6%); Flathead Catfish (4%); Crappie (3%)
- **Fishing Pressure**
 - September received the most pressure (7,739 hours), followed by May, July, June, August, and October
 - 95% of effort occurs via shore fishing
- **Catch, Release, and Harvest**
 - Total 2010 Catch Estimate: 20,800 fish
 - Total 2010 Release Estimate: 11,800 fish
 - Total 2010 Harvest Estimate: 9,000 fish
 - Greatest Catch Values: May
 - Greatest Harvest Values: October
- **Angler Satisfaction**
 - 57% Rated Above Average or Excellent; 4% Rated Below Average or Poor

Discussion:

- Q: Jeff Schuckman (NGPC) asked if the estimated 82,000 people per year visiting the Loup Power Canal for recreation included 11,000±-people per year on fishing trips.
A: Quinn Damgaard (HDR) noted that anglers and recreators of any kind were included in the 82,000 and noted that this is not information determined from the creel output, but was based on two alternate estimate methods that considered the number of persons interviewed and those observed. Damgaard also noted that Schuckman provided corrected numbers on creel usage prior to the meeting but noted that the updated numbers will not affect the overall use estimate.
- Q: Lee Emery (FERC) noted that various projects across the country use Christmas tree bundling to create structures for fish habitat and asked if that has been considered here.
A: Ron Ziola (Loup Power District) noted that bundled trees have been used on the south side of Lake North.
- Q: Randy Thoreson (NPS) noted that the report contains a lot of good information. He noted that the three main interests of NPS are inventory, use and demand, and possible improvements, and he also noted that all three would be discussed further in the Recreation Management Plan. He noted that the conclusions in Appendix F1 on page 14 contained very little information on use and demand; he would like to see more analysis and summary of conclusions in the Recreation Management Plan. He noted that requested facility improvements should be included in the Recreation Management Plan and noted that there was not any information in the slide presentation related to improvements associated with the recreation areas along the Loup Power Canal.
A: Damgaard noted that specifics regarding improvements along the Loup Power Canal were not included in the presentation but are provided in the report.
- Q: Thoreson noted that the Recreation Management Plan needs to marry the inventory information with the possible improvements at each location.
A: Damgaard noted that requested improvements by location are included in the report and that this information will be used to develop the Recreation Management Plan.
- Q: Thoreson noted that he would like to be involved early in the development of the Recreation Management Plan, including early outlines for it. He also asked if any improvements were requested to trails.
A: Damgaard noted that the report highlighted the top requests, so it appears that trail improvements were not one of the top requests. However, he noted that specific requests can be reviewed to confirm this.

- Q: Janet Hutzel (FERC) asked for clarification on why there are two percentages for “white” under the “Race” column in Table 5.7 and asked if one of them should be Hispanic.
A: Damgaard noted that one is white non-Hispanic and the other is white Hispanic because this is how the census breaks out ethnicity.
- Q: Hutzel noted that it was good to see that most people surveyed were okay with the survey and future capacity. However, capacity was exceeded, and Hutzel did not see any documentation or table of what the actual capacity is. She noted that the District would have included this information on the Form 80 by site and that it also needs to be provided in the Recreational Management Plan. It will be very important to FERC to determine whether improvements are needed. Thoreson agreed that this information would be helpful.
A: Damgaard noted that capacity data are available and will be provided in the Recreation Management Plan; he also noted that capacity is discussed in Section 5.2, Facility Inventory, where camping capacity by site is broken out.
- Q: Hutzel noted that she is more interested in percentages of usage so FERC can see what is at capacity, under capacity, and above capacity. She also noted that the Form 80 information requires percentages.
A: Damgaard noted that the only time that there was more usage than capacity in 2010 was Memorial Day weekend at Lake North and during the fall NOHVA Jamboree at the Headworks.
- Q: Emery asked how much ice fishing occurs, if any.
A: Ron Ziola (Loup Power District) noted that ice fishing is dependent on weather. During the last couple of winters, the cold spells have allowed for reasonable ice thickness; the few winters before that, there were not enough cold spells. Typically, on a weekend, 25 to 30 people ice fish on Lake North. The District discourages it only because they are cycling the water beneath the ice. He noted that there are signs to caution anglers about getting on the ice, but the District does not make anglers get off of the ice if they are out there.
- Q: Emery asked if there is any trapping.
A: Ziola noted that the area is a tight system, with dogs and cats and people moving around throughout. Occasionally, trapping does occur, but the District limits it to responsible trappers and is very particular about where and how people trap; the District does not want domestic pet issues.
- Jason Buss (CART) noted that he is looking forward to the Recreation Management Plan and collaborating with the District. People are very appreciative of using the facilities, and CART would like to offer any help it can.
- Q: Hutzel asked if showers were requested because of swimming or another reason.
A: Damgaard noted that showers were commonly requested at the Headworks by users of the OHV park. They stay for a few days and would like to use a shower. Camping is pretty open along the Loup Power Canal, so the showers would be for campers and others staying overnight and are not specifically requested by swimmers.

Preliminary Analysis – Studies 1, 2 and 5

Pat Engelbert (HDR) briefly discussed the common analyses that were used for Studies 1, 2, and 5:

- Field data collection (cross-section and water surface elevation data)
- Wet, dry, and normal flow classifications
- Synthetic hydrograph development
- Hydraulic model development and calibration
- Flow duration, volume duration, and flood flow frequency analysis

Discussion:

- Q: Lee Emery (FERC) asked for clarification on the cross section upstream of Site 4.
A: Pat Engelbert (HDR) noted that this was an intermediate cross section between the Tailrace

Return and the Burlington Northern bridge. He noted that one model was developed for both Sites 3 and 4 so that potential tailwater effects could be evaluated.

- Q: Paul Makowski (FERC) noted that it appears that the later cross sections show a widening of the channel, and he was curious whether that is showing actual channel widening.
A: Engelbert agreed that it looks like the channel could have shifted a little bit. Gary Lewis (HDR) added that the appearance of a change in channel width is likely due to a slightly skewed cross section measurement. He does not believe that any widening or narrowing occurred.

Study 1.0, Sedimentation Addendum (Ungaged Sites)

Study Results:

Pat Engelbert (HDR) presented the study results of the sedimentation study of ungaged sites. The key points were as follows:

- Both rivers at all locations studied are clearly not supply limited.
- Spatial analysis of effective and dominant discharge reveals that they increase in a downstream direction in a manner consistent with natural river processes.
- The effective discharge, and associated river morphology, has not changed since 1928.
- Sediment transport calculations show that the channel geometries are in “regime.” Nothing appears to be constraining either the Loup or Platte River from maintaining the hydraulic geometry associated with the effective discharges.
- The combinations of slopes, sediment sizes, and effective discharges result in all locations being well within the braided river morphologies, with none being near any thresholds of transitioning to another morphology.
- Literature and analysis clearly indicate that both rivers are in dynamic equilibrium with no indications of aggradation or degradation or channel geometry changes over time.
- Literature and calculations demonstrate that the Loup River bypass reach and the lower Platte River are in regime and are well seated within regime zones classified as braided streams.

Discussion:

- Q: Michelle Koch (NGPC) asked what the potential supply is based on. She asked whether it includes the sediment and sand in stabilized sandbars.
A: Pat Engelbert (HDR) noted that supply was calculated based on the amount sediment coming off the watershed through overland flow as well as the material available within the channel.
- Q: Koch asked if that is the moveable material rather than material that is stabilized.
A: Engelbert noted that this was done by USACE and that he is not sure if USACE looked at sandbars and islands. However, he noted that those would be relatively small in comparison to the supply available in the overall watershed. Gary Lewis (HDR) added that because of the methods used in the sediment yield calculations, he believes that the values are yields from the watershed and do not include the sediment in the bed. The supply available is in excess of the transport capacity and increases downstream because the watershed is contributing more sediment. All of the investigators consider that even if supply was less than the capacity, there is still ample surplus of material in the river that could be mobilized. If supply was found to be less than transport capacity for a prolonged period, it would mobilize bed material reserves, and changes might be noted over the years. Some changes in yield in the Loup River have occurred as reflected in the District’s dredging records. Supply in the MRBC report is that amount being carried to the streams by the watershed. If transport capacity exceeds available sources and reserve in the river is running out, then you will see a change. USACE concluded that because it looked at some of the same material, the yield is equal to transport capacity in the Platte River. The District’s calculations in the sedimentation study do not show it carrying less sediment than it is capable of. Instead, there is an oversupply of sediment, which is a clear definition of a braided river.

- Q: Jeff Runge (USFWS) asked if this oversupply of sediment would result in aggradation of the channel.
A: Lewis noted that the Platte River has degraded over the years in the geologic long-term, but USGS has not detected it.
- Q: Runge noted that if the supply greatly exceeds what is being transported, it seems like that would be evident on a much smaller scale than a decadal scale.
A: Lewis stated that there is a long-term effect of the oversupply of sediment, but we do not see it and it is not cause for alarm in the time frame of the Project life.
- Q: Runge asked why the regime model used in the Initial Study Report, which was a Leopold and Wolman model, was not used in this study.
A: Lewis noted that the Leopold and Wolman graph was discussed in the Initial Study Report but pointed out limitations with it. Because it was discounted in the Initial Study Report, it was not discussed in the Second Initial Study Report.
- Q: Tom Econopouly (USFWS) noted that the District's report also mentioned that USACE did not use the Leopold and Wolman model. However, he thought it would be nice to see it in the District's Second Initial Study Report for consistency.
A: Lewis confirmed that USACE did not use it and noted that USACE did not provide an explanation. Engelbert agreed that the Leopold and Wolman graph could be included in the District's report for consistency.
- Q: Runge noted that in the Initial Study Report, Parker's regime equation was used to look at effective flow discharge, sediment size, and slope to develop numbers for wetted width, mean depth, and mean column velocity. He asked why this was not computed for the ungaged sites.
A: Engelbert noted that Parker's equation was not used in the sediment transport analysis. However, dominant discharge was calculated, and then a width was determined based on a measured width versus discharge relationship. Lewis noted that Parker was mentioned as having done some work in the Platte River, but his method was not used in the District's study.
- Q: Econopouly asked how the slope for the cross sections was calculated for use in the models and the regime diagrams. He also asked if the d_{50} was estimated from nearby gages.
A: Engelbert replied that several sources were used for the information, including USGS topographic maps, surveys, and literature on the Platte River system. Then Engelbert explained that the d_{50} was calculated from USGS gages and compared to the District's dredging data. At the ungaged locations, like Site 2, information from the Genoa gage was used, but for Sites 3 and 4, data was interpolated between the gage locations based on river mile.
- Q: Runge noted that FERC requested, on page 11 of its Study Plan Determination, a longitudinal or spatial comparison of all sites on Loup and the lower Platte rivers, starting at the most upstream site on each river and going downstream.
A: Engelbert explained that each of the sediment transport calculations was listed relative to its gages and then trends were noted. Longitudinal analysis was conducted for sediment transport calculations.

Study 12.0, Ice Jam Flooding on the Loup River

Study Results:

Roger Kay (USACE) presented the study results of the ice jam flooding study. The key points were as follows:

- A review of flood history indicates that ice jam frequency has NOT increased since commencement of Project operations.
- A review of climatological data and hydraulic models does NOT show a difference in occurrence of minor ice jam flooding.
- Climatic variability and floodplain development may lead to an increase in flood risk with time.

- Project operations have NOT measurably changed the Loup River ice regime or increased the risk of significant ice jam flooding.

Discussion:

- Q: Randy Thoreson (NPS) asked why there was a difference in the blue data point in 1920, shown in Figure 2.2 on slide 177.
A: Roger Kay (USACE) explained that the blue data point shows only a 5-year average versus the other longer-term averages and that there were four very cold winters in that particular 5-year period.
- Q: Tom Econopouly (USFWS) noted that even though there may have been a lower probability of ice jams, that does not necessarily correlate to lower damages that could have occurred, so a low AFDD year could have more damage.
A: Kay noted that is possible but added that there was only one time when a below-average AFDD year had a significant flooding event and that was because a rain event occurred simultaneous to snowmelt.
- Q: Lee Emery (FERC) asked if there was a recent ice jam near Genoa.
A: Kay noted that there was a jam last year near Genoa, but it only caused lowland flooding. He also noted that the occurrence of jams showed no difference between the Loup River and other natural streams.

Study 2.0: Hydrocycling

Study Results:

Pat Engelbert (HDR), Matt Pillard (HDR), and Scott Stuewe (HDR) presented the study results of the hydrocycling study. The presentation of results began on February 23 and continued on February 24. The key points were as follows:

- Analysis of hydrocycling effects on water surface elevation (WSEL) revealed the following:
 - The difference between maximum and minimum daily WSEL was larger under current operations than under run-of-river (ROR) operations.
 - There were similar differences for ROR operations over several weeks.
 - The largest difference occurs for a dry year.
 - Differences are smaller downstream than in the Project vicinity.
 - The average annual difference in WSEL is typically less than 1 foot.
- For the nest inundation analysis for both interior least tern and piping plover:
 - Generally, current operations have higher maximum daily flows than ROR operations.
 - There were no instances where a current operations exceedance could have been avoided under ROR operations.
 - Normal seasonal flow events during the nesting season create conditions for potential nest inundation.
 - Project operations did not cause any exceedances of benchmark flows.
 - Run-of-river operations would carry slightly less sediment than current operations
 - Channel area would likely be slightly smaller under run-of-river operations.
- Literature review and comparison to other rivers indicated that because the Project does not control large flood flows, Project effects on daily sandbar formation from daily hydrocycling are minor compared to effects from large flood flows.
- Analysis of pallid sturgeon habitat using Peters and Parham's methods indicate that:
 - Compared to ROR operations, current operations exhibit a higher percentage of suitable habitat during maximum flows and a lower percentage of suitable habitat during minimum flow scenarios.

- The effect of hydrocycling on habitat diminishes as you move downstream with the most habitat found below Elkhorn confluence (above Ashland gage); under both ROR operations and current conditions, habitat above the Elkhorn confluence would be considered marginal.
- Preliminary results of the University of Nebraska-Lincoln Shovelnose Sturgeon Population Dynamics Study provides evidence that pallid sturgeon prefer lower reaches, but do utilize upper reaches, primarily during the spring when flows are higher.
- Review of the Lower Platte River Stage Change Study provided the following insights:
 - Percent habitat has a relatively high rate of change for flows ranging between 4,000 cfs to 6,000 cfs and large changes in discharge may have the most effect on pallid sturgeon when flows are in this range.
 - Changes in habitat areas as a result of 100 or 500 cfs environmental releases would have a negligible influence on pallid sturgeon habitat in the lower Platte River.
 - Increases in discharge do not move the conductivity, turbidity, temperature, or dissolved oxygen outside the typical range selected by pallid sturgeon
- Evaluation of cross-sections upstream and downstream of the Tailrace Canal return for both early and late summer indicated (Site 3 = upstream of Tailrace return; Site 4 = downstream of Tailrace return; Site 5 = North Bend):
 - At each site, average channel cross-section area decreased (3 to 6 percent) from early summer to late summer survey
 - Macroforms present in June were still there in September
 - Site 3 had greater percentage of exposed channel width than Site 4 during a wet year; the opposite was true during a normal and dry year.
 - Current operations had a lower percentage of exposed channel width than ROR operations.
 - Early summer cross-section exhibited a greater percentage of exposed channel width than late summer.
 - At Site 4, current conditions had a lower percent exposed channel width than ROR operations (other than at the 50 percent exceedance flow)
 - At Site 5, current operations had greater percent exposed channel width at 50 percent and 75 percent exceedance flows under current operations than did ROR for both early and late summer

Discussion:

- Q: Paul Makowski (FERC) asked why it is that as you move downstream, the sediment capacity does not necessarily increase.
A: Engelbert noted that Site 4 had the highest calculated sediment capacity. He stated that the curves for the ungaged sites were based on two or three survey dates within 1 year. The other parameter used was the d_{50} calculation, which was interpolated from existing gage stations. The combination of the two may be skewing the sediment transport.
- Q: Jeff Runge (USFWS) asked if the effective and dominant discharges were run through the HEC-RAS model to get width and depth numbers.
A: Engelbert noted that the discharge versus width and depth relationships were generated from the HEC-RAS model.
- Q: Runge asked why the effective or dominant discharge was selected as the measure to compare current and ROR operations.
A: Engelbert stated that it goes back to the original definitions of those terms. The discharges are what is ultimately shaping the river.
- Q: Runge noted that the HEC-RAS model assumes a fixed bed rather than a mobile bed.
A: Engelbert confirmed that the HEC-RAS model is a fixed bed model. However, the width and depth relationships were developed for a wide variety of flow scenarios, and the best fit of those relationships was interpreted to best represent a long-term average. As noted in the report, the best data available is this estimation looking at two points in time.

- Q: Emery asked if any pallid sturgeon stocking occurred in the Platte River and what size was stocked. He requested that the information be provided for the record.
A: Rick Holland (NGPC) noted that stockings occurred in the Platte River in 1996 or 1994; a small group was stocked at Two Rivers (river mile 42). Another stocking occurred as part of a telemetry study around 2000. However, he was unsure of the sizes. He noted that he will try to get the information for the record.
- Q: Joel Jorgensen (NGPC) noted that the benchmark flow was derived prior to April 27 but asked if in reality, it is more likely that larger flows that occurred later would create habitat for the birds.
A: Matt Pillard (HDR) noted that the analysis was not predicting whether a certain flow created a sandbar of a particular size.
- Q: Jorgensen noted that using April 25 as the start date for piping plover nesting is reasonable, but noted that May events may be a more important event for interior least terns. He asked if a different peak could be selected?
A: Pillard noted that selecting a second peak after the birds arrive was considered and is another way to look at later flows that would set a new benchmark. Lisa Richardson (HDR) pointed out that the slides were particular to piping plovers but that a separate analysis was completed for interior least terns. She added that the benchmark flow was the highest that occurred between February 1 and the established date when nesting begins for each species. Regardless of when the benchmark is set, the analysis is still the same: current operations do not exceed the current operations benchmark during the analysis period any more than ROR operations exceed the run-of-river benchmark during the same analysis period. Pillard added that in some years, the benchmark was never exceeded during nesting for either condition.
- C: George Waldow (HDR) noted that the analysis was completed using the methodology outlined in the Revised Study Plan and agreed to by FERC. Jorgensen noted that the study methods may sound good when they are created, but may not make sense once the study is conducted.
- Q: Runge asked FERC representatives to what extent modifications can be made to the study.
A: Emery noted that FERC typically does not make modifications. Instead, it looks at the results and tries to determine if something weather-related or beyond nature's control may have made the results bad. Normally, FERC makes its determinations based on the data it has and noted that only Limited changes could be made at this point.
- Q: Jorgensen (NGPC) noted that in the report, a key assumption is that nest distribution is considered to be a uniform distribution, a single volume where nests are distributed to sandbars and where in elevation the nests are located. In reality, nests can occur above and below the elevation in what is likely a normal distribution, but that information is not provided in the study. So peak flow, regardless of the magnitude, can cause nest inundation because there will be nests below the elevation. He noted that in 2008, the birds did not initiate nests until June 16, in that year there was a high flow event early in the season and a subsequent high flow event in July, when only one nest was found to be inundated. In 2009, 60 nests were inundated during a high flow event. He noted that each subsequent peak flow after nesting has an effect on inundation and that current operations has a higher peak than ROR operations, and so the probability of inundation is higher. He also stated that the peak flow event that occurred in mid-June 2009 and that there is data that says that inundation occurred – and if the peak flow is greater for either condition, that information could be used to determine effects.
- Q: Holland asked what the results from Leslie, et al showed related to beneficial results from subjecting habitat to periodic high flow and whether this occurred with daily hydropower operation
A: Melissa Marinovich (HDR) noted that the Leslie et al. study found that high flows regenerated the habitat and provided more habitat; they found that the dam in the study was releasing large flood flows, which was having a greater effect on the birds and proved to be beneficial. However, they found that hydrocycling was not affecting bird populations.
- Q: Runge noted that the analysis conducted for pallid sturgeon looked at percentage of change in habitat, but the relative change in high flow is in cubic feet per second (cfs). He asked how the

change in 4,000 to 6,000 cfs relates to change in habitat.

A: Scott Stuewe (HDR) noted that at 2,000 cfs, habitat is negligible, so with any increase from 2,000 cfs, there would be an increase in habitat availability. In looking at the cross sections, the increases from 4,000 to 6,000 cfs allow more habitat.

- Q: Runge asked if the Lower Platte River Stage Change Study could show the change in percentage of habitat at 4,000 cfs and 6,000 cfs.
A: Engelbert noted that the stage change study identified habitat types, which are typically based on hydraulic parameters. Sensitivity analysis was also applied to create ranges of flows to see how it changed in discharge.
- Q: Holland asked if conclusion of the stage change study is that due to constraints of the central Platte River, enough water cannot be put into the system to make a significant impact on flows.
A: Engelbert noted that it works the other way, too. When a large flow moves through, enough cannot be pulled out of the system.
- Q: Runge asked if the percentage of available sturgeon habitat could be tied to a specific flow?
A: Richardson responded yes and noted that although the body of the report presents results on a yearly basis, that the Peters and Parham analysis was conducted for the minimum and maximum flow for every day and that those results are included in an attachment to the hydrocycling report.
- Q: Isis Johnson (FERC) asked if any work was being done to compare how the results of the hydrocycling and sedimentation studies have impacted sandbar width.
A: Pillard noted that such a comparison has been considered, but it is difficult to connect everything together. Johnson noted that FERC will be evaluating what could reasonably happen so there will need to be some analysis of how the two studies interact.
- C: Holland noted that the data shows that early season cross sections have deep troughs and high points in the form of a channel, but the late season cross sections shallow out, showing some deposition in some of the deep areas. A portion of the deposition comes from erosion on the margins of the sandbars. He also noted that one of the most biologically significant findings in the comparison between current operations and run-of-river operations is that run-of-river operations decrease the variance of the stage relative to current operations. Therefore, a lot of habitat remains covered by water for longer periods of time under run-of-river operations. This impacts primary and secondary productivity. Under ROR operations, how great a percentage of habitat that is affected may not be as important as the effect on productivity in the system.
- Q: Michelle Koch (NGPC) asked how the duration of the high and low flows relates to the available habitat. She noted that a short high flow does not create much habitat because the water is not there very long; conversely, low flows that last a long time may not be used by pallid.
A: Stuewe noted that pallid may actually go out on the newly inundated areas to look for food and then return to deeper water areas for refuge. He is not aware of any documentation of pallid stranding due to hydrocycling. Holland added that there is no documentation of pallid stranding but that he has observed isolation of various other fish species in isolated pockets during low flows.
- Q: Runge asked what the time period is from peak to trough during hydrocycling.
A: Ron Ziola (Loup Power District) noted that it is 12 hours from peak to trough and 24 hours from peak to peak.

Study 5.0: Flow Depletion and Flow Diversion

Study Results:

Pat Engelbert (HDR), Matt Pillard (HDR), and Scott Stuewe (HDR) presented the study results of the flow depletion and flow diversion study. The key points were as follows:

- Flow depletions under current operations are less than would occur under the no diversion condition.
- On average, 71 percent of applied irrigation water is lost to consumptive use for both current operations and the no diversion condition

- Average annual Lost Creek flow entering the Tailrace Canal is approximately 14 cfs and the average annual flow discharged from the Tailrace Canal through the Lost Creek Siphon is approximately 12 cfs.
- There is an increase in stage under the no diversion condition; the magnitude of the change decreases with increasing discharge. The increase is largest under dry flow conditions.
- The Genoa gage shows a long-term positive (increasing) flow trend; the same trends are evident at Duncan. Therefore, it is concluded that there is no Project impact on long-term historic flow trends.
- Land Cover Aerial Imagery results:
 - Detectable differences in measured parameters above and below the Diversion Weir (based on average of all years analyzed) are as follows:
 - There are a greater number of sandbars per river mile above the Diversion Weir
 - The sandbars above the Diversion Weir are smaller
 - Channel width is, on average, 400 feet wider above the Diversion Weir than below.
 - A lower percentage of vegetation exists on sandbars above the Diversion Weir.
 - A lower percentage of bare sand on sandbars exists above the Diversion Weir.
 - More point bars exist below the Diversion Weir, and more mid-channel bars exist above the Diversion Weir.
- Habitat evaluation using HEC-RAS for cross-sections upstream (Site 1) and downstream (Site 2) of the Diversion Weir for current operations and ROR conditions:
 - Percentage of exposed channel width decreased with wetter conditions at Site 1 and Site 2 under both current operation and the no diversion condition.
 - At Site 2, current operations had greater percentage of exposed channel widths than under the no diversion condition.
 - Site 1 had similar percentages of exposed channel width as Site 2 under the no diversion condition.
- Sedimentation Analysis:
 - Total sediment transport, effective discharge, and dominant discharge were higher for the no diversion condition than current operations.
 - Channel widths and depths were greater for the no diversion condition than current operations.
- Regime Analysis indicated that current operations and the no diversion condition are both well within braided river morphology, with neither being near to transitioning to another morphology.
- Analysis determined that there were no measurable differences in depletions to the lower Platte River under current operations or under ROR conditions; therefore, fisheries and habitat are not adversely impacted to a greater extent under current operations than they would be under the no diversion condition.
- Evaluation of fishery populations and habitat above and below the Project Diversion provides the following conclusions:
 - NGPC studies show that fish use the lower reaches as much as the upper reaches, suggesting that habitat is not limiting.
 - Sport fisheries are similar upstream and downstream.
 - Montana Method analysis suggests degraded flows for the Loup River, but fisheries studies do not support this.
 - The Loup Power Canal is an important sport fishery resource.
 - The Platte River exhibits degraded flows upstream and downstream of the Loup River confluence; this suggests that fisheries habitat in the Platte River is not affected by Loup River diversion.
- Evaluation of the availability of potential whooping crane roosting habitat above and below the Diversion Weir under Project operations and the no diversion condition provides the following conclusions:

- Unobstructed widths above and below the Diversion Weir are outside whooping crane habitat parameters.
- Channel widths above and below are within whooping crane habitat parameters.
- The area of shallow water/wet sand is greater upstream of the Diversion Weir.
- For current operations there is a smaller percentage of channel widths with water depths of 0.8 feet or less during all low to medium flow conditions.
- For current operations there is a greater percentage of channel widths with water depths of 0.8 feet or less during all higher flow conditions.

Discussion:

- Q: Rick Holland (NGPC) asked why canal water was included under the no diversion condition.
A: Pat Engelbert (HDR) noted that there would still be some water present for years to come under the assumption that there is a ground water mound adjacent to the canal.
- Q: Paul Makowski (FERC) asked if the water in the canal is not really coming from the Loup River, whether it would go to the canal or to the Loup River. It is counter-intuitive that if you go from two bodies of water to one, there would be more consumptive use.
A: Engelbert noted that the assumption was that the groundwater would make its way to the Loup River. In accordance with FERC's Study Plan Determination, Project decommissioning is not a viable alternative; some water would remain in the canal for irrigators.
- Q: Makowski asked if 1 foot of water is being put into the canal for irrigators.
A: Engelbert noted that the assumption is that irrigation use would be the same with or without the Project, as stated in FERC's Study Plan Determination. However, in order to evaluate the consumptive use under the no diversion condition, the assumption was that there would still be water in the system through groundwater seepage. It was recognized by FERC in its Study Plan Determination that decommissioning was not a reasonable alternative; however, it provides the least amount of Project consumptive use.
- Lisa Richardson (HDR) noted that this analysis was related to depletions on the Platte River, not the Loup River. Because it is all part of the Platte River basin, water that seeps into the canal under the no diversion condition would be considered a potential depletion to the Platte River.
- Ron Ziola (Loup Power District) also noted that there are a few small areas that drain directly into the canal during rain events. There are approximately 8 to 10 locations where storm water would enter the canal. Engelbert added that several scenarios were discussed during study execution regarding the no diversion condition, and under all, there would still be some water in the canal exposed to evaporation.
- Q: Michelle Koch (NGPC) asked if the same lake coefficient was used for the Loup River bypass reach under current operations and the no diversion condition.
A: Engelbert answered yes.
- Gary Lewis (HDR) noted that even though it is believed that some losses will continue to occur in the canal for the no diversion condition, as shown in the table on slide 310, the results without this assumption are shown as well. The losses would be 18,260 ac-ft versus 18,080 ac-ft.
- Q: Holland noted that under the no diversion condition, there is a reduction in total acres of about 50 percent in the canal, yet evaporative loss is maybe 10 percent.
A: Engelbert noted that under current operations, 470 acres of surface area is reduced to 232 acres, or roughly half. However, the Project reservoirs would remain, and those continue to contribute to evaporation.
- Q: Holland noted that the reservoirs would have to be refilled each year if they are being included, and he asked if they are being refilled through precipitation directly into the reservoirs. He also noted that if the analysis was done over time, the reservoir volumes would decrease over time and thus the loss of depletion through evapotranspiration from the reservoirs would decline over time.
A: Engelbert noted that the analysis looked at scenarios both with and without the reservoirs.

Richardson added that the information was only shown for a single year; over the course of time, the amount of depletion would transition from the highest number to the lowest number.

- Q: Jeff Schuckman (NGPC) asked how many acre feet per year are used for irrigation and whether that amount would be lost under both current operations and the no diversion condition. He also asked if that irrigation water has to be provided even if there is no water in the canal.
A: Engelbert noted that an average of 2,000 acre feet per year are pulled out of the canal according to the District's metering records. This amount was assumed to be lost under both current operations and the no diversion condition. He also noted that the logistics of how the water would get into the canal was not evaluated. Per Scoping Document 2, decommissioning the Project is not an alternative that FERC would actually evaluate. Therefore, irrigation water would still be provided and the associated consumptive losses would be the same under any alternative.
- Q: Lee Emery (FERC) asked if there is still some water that enters Lost Creek from the old point of entry.
A: Engelbert replied that yes, water is still being conveyed to the siphon. Neal Suess (Loup Power District) added that the City of Columbus has built additional structures to make it clear where Lost Creek is and to return flow to Lost Creek. An additional runoff structure goes down to the Platte River.
- Q: Koch asked if other than just evaporative loss and evapotranspiration, was there any consideration to how much water is held back in the reservoirs that never reaches the Tailrace Return.
A: Engelbert noted that this portion of water volume was not taken into consideration. Ziola added that the District's reservoirs are not a dam. Water is impounded for less than 12 to 24 hours and then it has to be released back into the system. Lake Babcock can be drained, though not completely, and there is a small dead pool in Lake North that cannot be drained via the canal.
- Q: Koch asked if everything that is diverted into the canal goes back into the river except water that is taken out of the canal for irrigation.
A: Ziola answered yes, with the exception of the small dead pool in the bottom of Lake North.
- Q: Tom Econopouly (USFWS) asked if there is any seepage from the reservoir that is contributed to groundwater. He also asked where the coefficients for evapotranspiration for the winter and summer came from.
A: Engelbert noted that the Nebraska Department of Natural Resources' hydrologically connected liens (the 10-50 line) was evaluated, and as long as the water stays within that boundary, it is eventually returned to the Platte River system through groundwater. He noted that the coefficients for evapotranspiration for the winter and summer came from a document from USFWS.
- Holland noted that long-term positive trends start at the 50s, and there is evidence that flows are decreasing from the central Platte prior to that period of time. Part of the explanation from historical geological time is there used to be more flow coming from the central Platte system into the lower Platte system.
- Q: Isis Johnson (FERC) questioned how there could be a lower percentage of vegetation on the sandbar above the Diversion Weir and also a lower percentage of bare sand. She asked if this is based on overall surface area.
A: Matt Pillard (HDR) explained that it is because the sandbars are smaller above the Diversion Weir, and that is how the percentages turn out based on the size of the sandbars. He confirmed that it is based on the surface area available.
- Q: Joel Jorgensen (NGPC) asked if the aerial photos used in the land cover analysis were taken in the late July or August time period. Then he asked if the results would change if the macroform depth determination was changed from greater than 75 percent of the exposed sands surrounded by water to 100 percent surrounded by water.
A: Pillard confirmed that the photos used were taken in late July or August. He also confirmed that the results would change if the macroform depth determination was changed; the number of mid-channel bars would likely decrease and there would be more point bars if the macroform depth determination was increased to 100 percent surrounded by water.

- Q: Jorgensen asked how the study defined whether a sandbar was disconnected. He noted that from a bird's standpoint, a little water is probably the same as bone dry in terms of access to predators.
A: Melissa Marinovich (HDR) noted that Kirsch's methodology was used. Kirsch defined a mid-channel bar as anything that was surrounded by 75 percent or more water. Therefore, this was used for the mid-channel versus point bar determination.
C: Jeff Runge (USFWS) noted that USFWES requested 1-D modeling because it is hard to pick out sandbar types with aerial photos, and it requested that this information be supplemented with information on the ground, too.
- Jorgensen noted that for channel width, the average really does not mean as much as the extremes. For instance, on the lower Platte River, 50 percent of nesting occurs in widest 2 percent of the channel. He noted that the birds respond best to the width in the range 1,065 feet. He is interested in how different the top 10 percent of channel widths are because that is what the birds are using. The lower 50 percent of channel widths are not as important. Jorgensen also noted that a direct quotation from a report by Brown and Jorgensen was used, but the parenthetical statistical information was omitted. He recommended that the parenthetical data be incorporated in the report because the narrative builds upon that point.
- Q: Runge noted that the range of average valley widths is 15.2 to 24.3 miles, which are pretty wide. He asked if it would be safe to assume the valley width does not constrict the channel width or vice versa.
A: Pillard noted that valley width was studied in relation to interior least tern and piping plover nesting rather than channel width formation.
- Runge noted that the exposed channel width is helpful, but the 1-D model was intended to verify the information from the aerial photography analysis. There are some important variables that are missing, such as whether the percentage of exposed sand is attached or connected to the bank or disconnected as well as wetted width and mean depth, that would help improve this analysis.
- Q: Jorgensen asked if, based on sediment and dominant discharge information, it can be concluded that the no diversion condition would have sandbars at a higher elevation than with current operations because there is more sediment and greater dominant discharge. He also asked if there is an inverse relationship, that if there are deeper channels, the sandbar height would be an inverse of that.
A: Engelbert noted that it would convey more sediment, but it cannot be concluded that a sandbar would be higher. You can't make the leap to that conclusion because the sandbar height would potentially be limited by the channel banks. Lewis added that higher flows create higher sandbars; it is related to the hydrograph, not dominant discharge. He is not aware of any literature or methodology that relates to the height of sandbars. Lewis and Engelbert agreed that the sandbar would be taller but at the same elevation. In the study, however, it was shown they were at the same level in high events and did not change between current operations and the no diversion condition.
- Q: Holland asked if as long as flows stay within the river banks, can flow increase without an increase in dominant discharge.
A: Engelbert noted that the greater the flow is, the greater the dominant discharge will be.
- Q: Runge noted that HEC-RAS is a fixed bed analysis, so the channel geometry doesn't adjust with the change in dominant or effective discharge.
A: Engelbert responded that it is understood that the fixed bed is a limitation of the analysis but as compensation for that, the width and depth relationships were averaged between the two sets of cross-section (June and September).
- Q: Runge noted that the slopes are very similar upstream and downstream of the Diversion Weir and that there is nothing to constrain channel geometry, so under a no diversion scenario is it safe to say that downstream would look the same as upstream?
A: Lewis responded that probably over time, it would trend that way.
- Q: Runge asked how the different geometries upstream and downstream of the Diversion Weir related to the definitions of a braided stream.

A: Lewis noted that there would be differences in geometry, but they're both considered braided and that the full definition of the terms in Chang's paper would further explain the lines on the regime graph.

- Q: Jorgensen asked if there has been a change in regime above or below?

A: Engelbert answered no.

- Q: Runge asked that even though there are differences in geometry upstream and downstream that the broad conclusions are that both upstream and downstream are in regime and braided?

A: Engelbert responded yes. Lewis added that if the year by year dominant discharge from the original sedimentation study are plotted on the regime graphs that the same slope is maintained but moves left and right within certain limits but without heading in any particular direction.

- Q: Jorgensen asked that even if the river stays in regime as a braided stream, it can still have changes in geometry.

A: Engelbert responded yes.

C: Holland questioned the conclusions related to the NGPC fish sampling studies. He noted that the sampling in those studies was for relative abundance and presence or absence, and there were no population estimates for those studies and there is no information on trends.

Q: Runge asked if the Montana Method is an index of physical habitat and if so, was the analysis completed for a with and without diversion scenario?

A: Stuewe responded that conditions were evaluated upstream and downstream without a change in flow alternative. Richardson added that we have to assume that for a no diversion scenario, downstream conditions would mimic what you see upstream. She noted that it would be an improper application of the Montana Method to compare monthly flows downstream with mean flows upstream because upstream flows do not reflect the habitat; the Montana Method evaluates habitat based on the flows that are routinely seen in that particular stretch.

Next Steps

Lisa Richardson (HDR) discussed the next steps in the relicensing process.

- March 11, 2011 – District submits meeting summary
- April 11, 2011– Agencies file meeting summary disagreements and submit requests for modification to on-going studies
- May 12, 2011 – District responds to summary comments and study modification requests
- June 12, 2011 – FERC resolves comments and study modification requests
- August 26, 2011 – District submits Updated Study Report to FERC
- September 9, 2011 – Updated Study Results Agency Meeting (Location TBD)
- November 18, 2011 – District files Draft License Application

Discussion:

- C: Randy Thoreson (NPS) – There is a lot of good information and really wants to be involved in the recreation management plan, please convey to him the schedule to be involved.