Fort Peck DEIS / IEPR Mid-Review Call

Wednesday, May 19, 2021, 12:00pm – 2:00pm CT

--FINAL SUMMARY--

Opening Remarks

Facilitator Marci DuPraw (John S. McCain III Center for Environmental Conflict Resolution, or "NCECR") welcomed participants to the Mid-Review call for the Independent External Peer Review (IEPR) of the Fort Peck Dam Test Release Draft Environmental Impact Statement (DEIS).[1] She reviewed the agenda, explaining that the objective of this call was to enable the US Army Corps of Engineers (USACE) and its study team to answer any questions the ISAP had about the review documents and / or ISAP's charge. The attendee list can be found in Appendix A.

Third Party Science Neutral (TPSN) Dr. Steve Bartell provided an update on the progress of the review, which got underway April 15, 2021. Plans for the review process were initiated during the tenure of the former TPSN, Dr. Robb Turner, and finalized during the tenure of Dr. Bartell, which began December 20, 2020. Dr. Bartell explained that for this review, he had invited comments from all ISAP members on any section of the DEIS and will ensure that each section is reviewed by at least one panel member. Dr. Bartell thanked panelists for their hard work and commitment. He also thanked participants for joining the Mid-Review Call today and looks forward to ISAP members sharing some of the questions that have arisen during the review process to date.

Review Chair Dr. Melinda Daniels provided an overview of the sorts of questions the ISAP wished to discuss on the call, noting that they focused on deepening the ISAP's understanding of the DEIS by surfacing things that are not explicitly in the review documents (more detail, rationale, etc.). The ISAP had provided a list of specific questions prior to the call, and one was added at the end of the call. During the call, the group worked these questions, with Dr. Daniels asking a particular ISAP member to present a question, and Mr. Aaron Quinn (USACE) answering or re-directing the question to a particular colleague.

ISAP Questions and USACE / Study Team Responses

[1] USACE seeks to conduct this test release as part of complying with the 2018 Final Biological Opinion concerning the Operation of the Missouri River Mainstem Reservoir System, the Operation and Maintenance of the Bank Stabilization and Navigation Project, the Operation of the Kansas River Reservoir System, and Implementation of the Missouri River Recovery Management Plan. The DEIS assesses the capacity of test flows released from Fort Peck Dam to foster the growth and survival of the endangered pallid sturgeon from the embryo stage to the free-swimming juvenile stage. The IEPR is being conducted by the Independent Science Advisory Panel (ISAP) associated with the Missouri River Recovery Implementation Committee (MRRIC). Dr. Melinda Daniels, Dr. John Loomis, and Dr. Steve Chipps are co-chairing the review.

Question 1: It is difficult to estimate water temperature increases below Ft. Peck, based on different release scenarios as it depends on a myriad of conditions. But I would like to hear an educated guess as to what we might think is a reasonable range. Any increase in water temperature would have a critical influence on development rate and resulting drift distance for protolarvae – especially because fish metabolism is related non-linearly to water temperature. Dr. Steve Chipps (ISAP) explained that the gist of this question is that it is unclear how warm surface water releases occur at the Ft. Peck Dam.

- Answer:
  - Mr. Joe Bonneau (USACE) explained that:
    - Although the temperature of the water released depends on nature, water is generally warmer when it reaches a high enough level in the reservoir to release over the spillway.
    - There is lots of good temperature modeling available, but it is hard to predict what nature will actually do; what happens in the last two weeks prior to a test flow could help or hinder the results. For this reason, it is good to be flexible about the exact timing of a test flow; USACE should be able to delay a week if necessary.
    - USACE can provide additional information and relevant graphs on this point to the ISAP if it would be helpful.
  - Mr. Quinn added that:
    - It would be valuable to include additional information concerning water temperature in the DEIS.
    - USACE will monitor the effects of water temperature as soon as the test flow is up and running.

- Action Item: USACE will provide the ISAP with additional information and graphs pertaining to water temperature increases at Ft. Peck.

Question 2: What evidence is there to support the assumption that the proposed flow alternatives are sufficient to produce a biological response?

- Answer:
  - Mr. Quinn indicated that this assumption is based on field observation. There have been several observed instances where fish have traveled up the Missouri River, rather than the Yellowstone River.
  - Mr. Bonneau mentioned that:
    - He had been involved with a team that produced hydrographs of natural flows over the Ft. Peck spillway in 2018. Those flows were similar to the proposed test flows that these assumptions were based on.
    - Regarding the biological response, there are two relevant parts to consider – 1) what is required to get young fish to survive when spawning occurs at Ft.

Peck (considering temperature, flow, models, and empirical evidence, we have good predictive ability for this); and 2) whether fish will spawn at Ft. Peck (the bigger uncertainty).
    - Pallid sturgeon usually spawn on the Yellowstone River, rather than on the Missouri, and there has not been much variation in fish spawning location in the past year. The only example of fish spawning at Ft. Peck was in 2011, under extreme conditions. However, the 2018 flow over the spillway was similar to the current proposal and several fish moved up the spillway (although at the last minute, they returned to the Yellowstone River to spawn).
    - That, along with expert elicitation, was used to draft hydrographs for what might attract young fish to spawn in the Missouri River. We will get answers in real-time as we watch the test flows.
- Graham Long (Compass) added that a Tech Team report written when the hydrographs were developed indicates that we will look at what is needed and what is possible. I can locate those graphs and forward the technical report to the ISAP if desired.

➢ Action Item: Mr. Long will locate the 2018 technical report and associated graphs to send to the ISAP.

Question 3: What is the rationale for excluding 2012-present from the historical period of record?

➢ Answer:
- Mr. Quinn explained that USACE had 82 years of data ready for analysis, while it would have taken inordinate time and effort to do the modeling and impact analysis on these additional 8 years. It did not appear to be necessary in order to tell the difference between the impacts of the various alternatives.
- Ms. Tiffany Vanosdall (USACE) also explained that Mr. Ryan Larsen (USACE) looked at the years 2012-2020 and none were conducive to running a test flow. These data suggested that the impact from running test flows would not have substantially changed during that time frame.
- Dr. Daniels indicated that recent years are still important to consider in the context of climate change, since the recent decade is the most closely related to future conditions in the basin. It appears that there would have been few opportunities to run the test flow in recent years.
- Dr. John Loomis (ISAP) added that understanding flow data from 2019 might reduce uncertainty about what could happen with the Ft. Peck test flow, specifically regarding the timing element of how the test flow coincides with critical water demands for crops in the basin.

➢ Action Item: USACE will follow up on this question with Ryan Larsen and request that he provide written answers to the ISAP.

<u>Question 4</u>: The assumption that all side-channel irrigation intakes would be removed during test flows seems extreme. Does this occur during natural flow of similar magnitudes? How does the timing of high test flows correspond with irrigation water demand/crop production cycles?

- <u>Answer</u>:
  - Mr. Quinn explained that, in the main body of the DEIS, USACE shows a range of possible impacts on irrigation (25-100%) so that irrigators can plan for all possibilities.
  - Ms. Lisa McDonald (USACE) explained that USACE did a field survey over the summer of 2020, which analyzed side channels differently from main channels to account for different flow impacts. In January and February, USACE spoke to stakeholders on the side channels and asked questions based on stakeholders' most recent experience with high flows in 2018 and 2019. Approximately 90% of those interviewed reported that they have experienced high water impacts in the past and will likely experience impacts under test flow conditions. Those interviewed also agreed to allow intakes to be monitored for sediment impacts and other impacts during a test flow. Because the greatest impact to side channel intakes occurs after high flows recede quickly and leave sediment across the channel, advance warning of a test flow will be critical to all irrigators so that they can adjust their irrigation patterns accordingly. This warning will help irrigators mitigate the impacts following high flow periods when they may not have water due to sediment buildup.
  - Dr. Daniels inquired as to whether USACE had asked irrigators if they had had to pull their booms during the high 2019 flows, which were very similar to the proposed test flow. Ms. McDonald indicated that:
    - USACE had done so but found it difficult to draw a 1:1 comparison between high flow impacts in 2018 and 2019 and projected impacts from a test flow since they occur at different times during the year. For example, 2019 saw a high flow early in the season (around April) whereas the 2018 high flows were relatively consistent. By contrast, the test flows would occur right in the middle of high demand for irrigation water.
    - The intakes had not been put into the river at the time of the high 2019 flows because irrigators were still clearing away sediment.
    - The sediment build-up associated with high flows in the middle of the irrigation season probably would take 2-3 weeks to clear away and restore function, resulting in crop impacts. It is quickly receding water that causes the impact as sand bars are deposited (rather than the high flows themselves); sand bars can impact intakes as far away as half a mile from the main channel. Mr. Quinn added that USACE has a general cost estimate for such impacts but would need to flesh that out before running a test flow.
  - Dr. Loomis asked if all irrigation intakes were impacted. Ms. McDonald indicated that 80-90% of them were impacted in 2018 and 2019.

- Dr. Loomis asked if advance warning helps. Ms. McDonald said yes, it might help some irrigators, who might pull out intakes. Irrigators might also increase irrigation in advance to increase soil moisture in hopes of tiding the crops over.
- Dr. Daniels suggested that a breakdown between the high flow impacts from 2018 and 2019 might be helpful. Ms. McDonald agreed to get the difference between the two years to Dr. Daniels.

➢ Action Item: Ms. McDonald will deliver a breakdown between high flow impacts from 2018 and 2019 to Dr. Daniels.

Question 5: How many test flows are likely to occur during the next 50 years? Why is the impact analysis performed via back-casting using the pre-2012 period of record rather than forecasting?

➢ Answer: The DEIS shows the frequency of flows similar to the proposed test flow during the 82-year period of record. Ms. Vanosdall shared that USACE is currently looking at short term test flows to gauge effectiveness, rather than looking to run test flows over the next 50 years.

Dr. Daniels noted that the DEIS is not clear as to the period covered by the impact analysis, and that it should include forecasted impacts in addition to "back-casted" impacts over the last 82 years. Dr. Loomis said that as he understands it, USACE is contemplating 3-5 test flows, but it also says there could be 11-25 occasions when a test flow could be run; the DEIS needs to state explicitly how many test flows were assumed in analyzing impacts and also whether the analysis is cumulative. The reason the ISAP is concerned about this is because the economic impacts vary widely depending on how these aspects of the analysis are handled.

Mr. Quinn responded that:

- Impacts differ each time a test flow is run (with different background conditions in different years), so USACE used the term "overall impact" and discussed impacts to specific resources over the average of years the test flow is run. Table 33 in the DEIS illustrates how many times a test flow could be run, by alternative, with given constraints, based on historic conditions on the Missouri River within the 82-year period of record.
- He offered to provide clarifying language to add to the DEIS's executive summary and at the beginning of Chapter 3 where methods for impact analysis are introduced and it is explained how impacts will be represented.
- He will need to speak with Ryan Larsen about how the water management team would model the impact analysis over a 50-year forecast.

Graham Long added that flow conditions are "lumpy" – i.e., good conditions for a test flow come in clusters of years. In the last 82 years, the Missouri River system has seen 5-6 drought periods. Twenty years could pass without appropriate conditions, followed by 3-5 years suitable for test flows. Dr. Daniels agreed and pointed out that it does not

come across clearly in the DEIS that in the next 10 years there could be a cluster of 3, 4, or 5 years where conditions would allow a test flow to happen, or those conditions might not occur at all.

Action Items:

- Mr. Quinn will touch base with Ryan Larsen on how to model the impact analysis over a 50-year forecast.
- USACE will clarify language in the executive summary and at the beginning of Chapter 3 to more explicitly describe methods used in the impact analysis.

Question 6: The Executive Summary states: for piping plover, the extinction probability for the no action case ranges from 12.9% – 14.3% for the northern region; and 20.7% - 22.1% for the southern region. What is an acceptable extinction probability? Afterall, this is only a probability based on models. What is the biological relevance of this result (which is not addressed in the Executive Summary)? Can you assign a statistically derived variance to these outcomes? Not for the purpose of asking whether the scenarios generate different results, but more of what is the minimum and maximum values (within reason) that might occur under no action. If no action, will the plovers go extinct? See p. 21/621. Dr. Bill Warren-Hicks added that it is not clear to the ISAP how carefully USACE considered the no-action alternative. On the face of it, it is not clear why that alternative is not seen as more viable than it seems to have been deemed. The extinction probabilities are low. This alternative does not seem to have been modeled. Was it rejected for policy reasons? Was it rejected too soon? We did not see a science-based rationale.

- Answer: Mr. Quinn responded that:
  - The main reason the no-action alternative was not chosen is because it does not meet the purpose and need of the study – i.e., to comply with the 2018 BioOp. Thus, it would not allow USACE to meet its obligations under the Endangered Species Act.
  - Under a typical NEPA analysis, the no-action alternative refers to what would occur if USACE did nothing. In this case, the no-action alternative refers to a situation in which there is no test flow, and the river system is operated according to the Master Manual (as it is currently). We obtained the extinction probability for the no-action alternative from biological datasets; no modeling is necessary.
  - The Problem Definition, Objectives, Alternatives, Consequences, and Tradeoffs (PrOACT) analysis compares the impacts of alternatives 1 and 2 (with test flows) against the no-action alternative. The goal of the analysis was to see if hydrological options would increase the likelihood of pallid sturgeon spawning options. In a no-action alternative, a reasonable amount of interception occurred, and those numbers rose considerably. The report discusses implications of each alternative, but it may be helpful to add clarifying language on this subject to the executive summary.

- Action Item: USACE will add language in the executive summary to clarify why the no-action alternative was rejected, including differences in impact.

Question 7: USACE used HEC-ResSim and HEC-RAS. Are there any outputs that are similar among the models, and if so, do you find the answers to be the same? Why these models? Were similar scenarios run on both models, did they get the same answer, are other models available for a one-to-one comparison? How do you know these models are appropriate, or the best for this exercise? Note that the same question can be asked of the DSM model, demographic population model, and HC models. Same question holds for the fledgling production model for plovers and terns. Dr. Bill Warren-Hicks said he enjoyed the DEIS discussion of the population model and equations but is wondering if USACE collected the right data. He wonders how the model is calibrated to the sampling design. Free embryo retention is key to the model; does USACE have data on that?

- Answer: USACE will need to provide additional description and justification for each of the model types used in the DEIS. Each model is the industry standard; the Reservoir System Simulation (ResSim) model represents how reservoirs run, and the Hydrologic Engineering Center – River Analysis System (HEC-RAS) model shows how water plays out over floodplains and in channels down the river. The models are very expensive to build, and it is difficult to find a model that is as accurate as these that will work with the size of the Missouri River system. Mr. Quinn will confer with Ryan Larsen to provide the ISAP with a written response to this question and will try and locate language that conveys the accuracy and credibility of these models. USACE and the industry have confidence in the models, but he acknowledged that it would be helpful to explain that at the outset.

  Dr. Warren-Hicks suggested that his book could be helpful in this regard and pointed Mr. Quinn to the section on modeling and uncertainty where it discusses modeling outputs compared against actuals.

- Action Item: USACE will provide additional descriptions and justification for the use of the ResSim and HEC-RAS models in the DEIS.

Question 8: The pallid sturgeon upper river demographic population model is deterministic, terms in the model are listed on p. 20/195 (pdf) of Appendix E. Are any of these terms available from our survey information? For example, do we have information on the probability a female fish matures between i-1 and age i? Are there data on free-embryo retention, and if not, should we be addressing this issue? In the same vein, how is this model calibrated or linked to the current sampling designs?

- Answer: Mr. Joe Bonneau indicated that USACE has a table a couple of paragraphs of detailed text that speaks to this, and he will get it to the ISAP soon. Dr. Chipps thanked Joe and added that while it can be difficult to trust any model (whether deterministic or stochastic) to provide exact estimates of future conditions based on currently available data, his sense is that the population model is pretty solid and that USACE is doing a good job navigating any uncertainties posed by the models. Still, it is important to

acknowledge that uncertainty in the text of the DEIS. He suggested that in most cases a qualitative comparison is sufficient.

- Action Item: Mr. Bonneau will provide the table to the ISAP along with supplementary language for context.

Question 9: Dr. Darren Ranco indicated that the environmental justice analysis that was woven into the DEIS relied on 2020 census blocks to identify target communities for this analysis. He sees that as a good method to identify where minority and low-income populations live and work. He notes that the conclusion was that test flows would have no disproportionate impact on such communities. What method was used to determine impact/lack of impact on those communities?

- Answer: Ms. McDonald explained that USACE's analysis followed the sequence below:
  - Where will potential impacts occur? Answer: Montana, below the Fort Peck Dam.
  - What are the potential impacts? Answer: potential flooding and impacts to hydropower and irrigation.
  - Where possible, USACE broke out impacts to Tribes, looking at the impacts on Tribal irrigators and comparing those to impacts on other irrigators.

  USACE has strengthened that discussion in the final EIS. Dr. Ranco was glad to hear that and will look forward to seeing the new discussion.

Question 10: Dr. Darren Ranco asked about USACE's cultural resources analysis and how USACE linked critical infrastructure to cultural resources by using the HEC-RAS flood impact analysis. He thought that Appendix F was supposed to describe this but didn't see it there.

- Answer: Mr. Quinn clarified that:
  - Appendix F of the DEIS is divided into sections, one of which focuses on cultural resources. That is where the ISAP can find USACE' rationale for its cultural resource analysis in Appendix F.
  - Critical infrastructure is discussed in the subsection on cultural resources and non-market impacts. The write-up of flood management impacts and methods of cultural site monitoring was completed by modeling known locations of cultural sites along the Missouri River. (The actual location of cultural resource sites is protected information.) The sites used in the analysis were intended to be a representative sample to give an idea for how the risk of looting would vary at such cultural sites depending on water level (e.g., more risk is associated with low water due to exposure of cultural resources). However, even under existing operations, site risk levels fluctuate.

Wrap-Up & Next Steps

Participants reviewed the list of IEPR milestones; remaining milestones are shown below.

Remaining Milestones in 2021 IEPR Timeline	
ISAP Comments Submitted to USACE	June 30
USACE Responses Provided to ISAP	July 19
ISAP Presents Overview of Comments to MRRIC	July 27
ISAP Back-Check Responses Due to USACE	August 6
ISAP Submits Final IEPR Report to USACE	August 23

Dr. DuPraw mentioned the emerging draft charge for Dr. Ranco to engage with MRRIC Tribes and invite them to share with Dr. Ranco indigenous knowledge pertinent to this review if they wish, which can then inform Dr. Ranco's advice to the ISAP. She explained that the charge does not direct him to engage in formal consultation, but rather, seeks to operationalize a recommendation from Dr. Norder that the indigenous knowledge(s) panelist should serve as a conduit for MRRIC Tribes to make available indigenous knowledge pertinent to ISAP reviews.

The deadline for MRRIC feedback on the draft charge for Dr. Ranco is Monday, May 24. As soon as the charge is finalized, Dr. Ranco will be able to proceed with his work. He and Mr. Quinn will partner on a presentation to the Tribal Interest Work Group (TIWG) to help MRRIC Tribal representatives absorb key elements of the DEIS and consider providing relevant indigenous knowledge. Dr. Ranco will provide his views on the Fort Peck DEIS to other ISAP members in the form of a memo (in addition to normal verbal participation in ISAP deliberations), in which he might support his opinion as appropriate with information provided by MRRIC Tribes. The ISAP then will consider Dr. Ranco's opinions as they formulate and present comments to the Lead Agencies and MRRIC regarding the Fort Peck DEIS.

If a contributor requests the information be treated as confidential, Dr. Ranco will honor that request. Contributors' identities will be confidential, both in the memo and in conversation about this topic. Mr. Quinn offered to provide the ISAP with the slides he plans to present to the TIWG and looks forward to helping advance the process in any way he can.

Dr. Loomis reminded Dr. Ranco and Mr. Quinn to schedule their meeting with the TIWG as early in June as possible, to give the ISAP adequate time to review and integrate Tribal comments and questions into its report to USACE by the end of June. The Co-Chairs expect to have all contributions in hand from individual ISAP members by June 1st, at which point the Co-Chairs will organize it into a complete package. They anticipate having a complete draft of all pieces of the report by June 16th. An additional week will then be spent reviewing the package to ensure it translates clearly to outside readers.

Dr. DuPraw thanked participants for their time and productive conversation. Dr. Daniels will follow up with individuals offline with the Action Items identified during the call (see below).

Mr. Quinn encouraged the ISAP to follow up with any further questions, going through the TPSN.

Action Items

Task	Who
Provide the ISAP with additional information and graphs relating to water temperature increases at Ft. Peck.	USACE
Send the 2018 technical report and associated graphs to the ISAP.	Graham Long
Confer on an answer to Question 3; arrange for Ryan to send answer to the ISAP in writing.	USACE (Tiffany Vanosdall & Ryan Larsen)
Deliver a breakdown between high flow impacts from 2018 and 2019 to Dr. Daniels.	Lisa McDonald
Touch base with Ryan on how to model the impact analysis over a 50-year forecast.	Aaron Quinn
Provide clear language in the executive summary and beginning of Chapter 3 to clarify methods used in the impact analysis.	USACE
Clarify language in the executive summary about why the no-action alternative was rejected, including differences in impacts of the alternatives.	USACE
Provide additional descriptions and justification for the models used in the DEIS (ResSim and HEC-RAS).	USACE
Provide to the ISAP a table and text that speak to Question 8 (how the model is linked to the sampling design).	Joe Bonneau
Share the slides for the TIWG presentation with the ISAP	Aaron Quinn
Follow up with individuals off-line regarding these action items	Melinda Daniels

Appendix A

Attendees

Christina Austin-Smith	U.S. Army Corps of Engineers (USACE)
Brian Barels	MRRIC Member
Steve Bartell	TPSN
Joe Bonneau	USACE
Gail Bingham	MRRC Chair
Alyssa Bonini	John S. McCain III National Center for Environmental Conflict Resolution (NCECR)
Steve Chipps	Independent Science Advisory Panel (ISAP)
Melinda Daniels	ISAP
Steve Dinsmore	ISAP
Marci DuPraw	NCECR
Doug Hardy	MRRIC Vice-Chair
Kendra Laffe	USACE
Graham Long	Compass
John Loomis	ISAP
Lisa McDonald	Pinyon Environmental
Dennis Murphy	ISAP
Jamie Myers	USACE
John Norder	ISAP
Darren Ranco	ISAP *(Ad Hoc)*
Aaron Quinn	USACE
Bill Warren-Hicks	ISAP
Tiffany Vanosdall	USACE
Barbara Shepard	