Questions for Mid-Review Ft. Peck IEPR Call

05-19-2021

1. I realize 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.

   Joe Bonneau provided information on this question to Steve Chipps and Steve Bartell via email on 5/19.

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

   The Drift and Settling (DSM) predicts an improvement in retention under Alternatives 1 and 2 as compared to the No Action Alternative. Additional information on the Conceptual Ecological Models and the DSM are described in Chapter 2 of the Fort Peck AM Framework (Appendix F) and the Pallid Sturgeon Model Document (Appendix E).

   Despite the DSM being based on the best available science, uncertainty about the potential benefits of test flows still exist. That is why the test flows would be monitored and analyzed as part of the Fort Peck AM Framework.

   Additional Information about the Pallid model was provided in an email response to Question #8.

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

   The models were originally developed using the 1930-2012 POR and used for the Missouri River Recovery Management Plan EIS (2018). At the beginning of the Fort Peck DEIS effort (2018), these models were already available and ready for use. We believe this period of record gives an adequate range of flows to assess potential impacts of test-flow alternatives in the Fort Peck Test Flow EIS.

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

   Response and additional information from Lisa McDonald are in the attachments to this email.

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

Partially answered on the call. We aren't certain how many times the test flow would be run in the next 50 years because we don't have the capabilities to forecast Missouri River flows that far out. We use the observed POR to infer effects that could happen in the future. The number of times test flows could be run based on POR modeling are shown in Figure 3-3 of the Draft EIS.

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?
    a. 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)?
    b. 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.
    c. If no action, will the plovers go extinct? See page 21/621.

The bird model was used to assess the risk to piping plovers and least terns from the test flows. The bird model produces extinction probabilities that are used to measure compliance with the 2018 BiOp. On the call we discussed clarifying the text in the Executive Summary for the Final EIS which is a good suggestion. The model results in this case didn't help us choose between alternatives because the differences were negligible. The No Action Alternative and both Action alternative model results were all within an acceptable range (according to metrics in the 2018 BiOP).

There is a great deal of information on the bird models and their development history in a series of Effects Analysis Reports and ISAP reviews that occurred from 2016-2018. Those reports can be made available upon request.

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?
    a. Why these models?
    b. Were similar scenarios run on both models, did they get the same answer, are other models available for a one-to-one comparison?
    c. 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.

On the call we discussed including some background explanation of the modeling framework (likely in Section 3.1) that would describe the models and model review process to help the reader have confidence that the models used are appropriate. This is a good suggestion.

Some additional info:

ResSim simulates reservoir operations and HEC-RAS simulates river hydraulics. Both are industry standards used extensively by the hydrologic engineering community. The answers wouldn't be the same from these models because the outputs are simulating different things.

The models used in this effort have gone through the USACE model review and certification process, have been previously reviewed by the ISAP/ISETR and review documentation is available. The bird and pallid models in particular have been extensively reviewed by the ISAP. The HC models and RAS/ResSim models are described in their respective appendices and also described in the Management Plan EIS (2018) technical reports:

https://www.nwo.usace.army.mil/mrrp/mgmt-plan/

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?
    a. Are there data on free-embryo retention, and if not, should we be addressing this issue?
    b. In the same vein, how is this model calibrated or linked to the current sampling designs?

See email from Mike Colvin. Aaron forwarded to Steve Bartell and Marci DuPraw on 5/26