

**Responses to Independent Social Economic Technical Review (ISETR) Comments Sioux Falls,
SD May 2015 MRRIC meeting**

The presentation by the ISETR panel at the May 2015 MRRIC meeting contained a number of useful points that will be incorporated into the Management Plan effort. The USACE and the USFWS appreciate the input and insight the ISETR offers for consideration. The agencies also appreciate the opportunity to provide responses for clarification and further explanation. The ISETR comments are identified below and are organized in the same manner as the presentation slides. The agencies' responses are identified in blue and follow the ISETR comments.

1. Comment: ISETR is concerned that changes in alternatives, methods used, and assumptions from Feb –May –Aug –Nov is leading to confusion among stakeholders and potentially to different conclusions about which alternatives are “better.” Need to manage process and expectations carefully.

- River geometry - Effects of future river geometries to be used (reflecting anticipated aggradation/degradation) is confusing
 - February meeting use of 50 years out proved to be too far to be relevant for many stakeholders & involves significant forecast uncertainty.
 - 12 years out (2025 –proposed for August meeting) may be a relevant time line for the stakeholders and involve less forecast uncertainty, but seems late in the process –differences in results (from May to August) need to made clear
 - Ideally show comparison of proxy results using current and 12 years out in August including implications of differences.

Response:

- a. Effects of different river geometries are an important aspect of the analysis. While results can be confusing, the Management Plan team has conducted several webinars and provided detailed information regarding the various river geometries used in the modeling effort. This open communication strategy will be continued in the future.
- b. Existing Conditions for all models is based on the best available information. Data sources and dates vary by reach.
- c. A Year 2060 forecast of channel geometry with proposed Management Plan “test bird alternatives” was presented at the February MRRIC meeting. The channel geometry included aggradation/degradation assumptions and additional

Shallow Water Habitat (SWH) projects. MRRIC members indicated that the results associated with the 50 year forecast were too far out in time to be relevant for many stakeholders. We concur with that assessment and have proposed use of Year 2025 forecast channel geometry as a reasonably foreseeable condition.

- d. Year 2025 forecast channel geometry is currently being prepared by hydraulic engineers in the Omaha and Kansas City Districts. This reasonably foreseeable channel geometry will be more relevant to stakeholders as they consider the differences between Management Plan alternatives associated with aggradation/degradation assumptions and additional habitat construction following the 2003 BiOp.
 - e. The Management Plan Hydraulic and Hydrologic (HH) modeling team is currently proposing a third modeling webinar in the September 2015 timeframe to discuss the assumptions and methods associated with creation of the Year 2025 forecast channel geometry, demonstration of modeling results, and to answer stakeholder questions.
 - f. Channel geometries have been evolving as the team better understands the Management Plan needs, responds to comments, and refines alternatives.
- **Proxies vs final metrics**

Response:

- a. The proxy metrics are calculated as an intermediate step in the process of conducting the more detailed analysis for the final HC objectives and metrics. Because of this, the proxy metrics illustrate directly the relative extent to which changes in the system affect the HC interests.

The proxies also provide a tool for communication with MRRIC. The proxies have been developed collaboratively with MRRIC and are based on the set of HC objectives and metrics recommended by MRRIC. The proxies allow the Management Plan team and MRRIC members a first look at how potential actions may affect each interest and provide an opportunity to learn about each others' interests in a manner that is not overly complex. As has been communicated previously, the proxies will be used to assess consequences and trade-offs with MRRIC for Rounds 1 and 2 and allow a consistent method for evaluation through the consequences and trade-offs discussions with MRRIC.

The HC proxies are being used by the study team to help inform the alternatives formulation process and refinement of actions towards the development of final

alternatives. The proxies will help the study team identify the resources and geographic locations in which to focus more detailed analyses for a final set of actions/alternatives. For example, if there is little to no change in a proxy for the actions/alternatives evaluated, detailed analysis may not be needed for the related HC objectives and metrics. The more detailed analyses, as outlined in MRRIC's HC Objectives and Metrics recommendation, will take place after Round 2 consequences and trade-offs discussion.

- Addition of pallid sturgeon actions

Response:

- a. Formulation of and the iterations involved in developing alternatives is complex even for professional planners and biologists. Tracking, understanding, and participating require intense focus and interaction, including building on information from the Effects Analysis and involvement from SPA Task Group and ISAP at critical junctures. The agencies have and will continue to keep MRRIC members up-to-date on formulation developments prior to releasing the DEIS. At this point, the general next steps in the development of bird and pallid actions and engagement with MRRIC includes:
 - i. August: Provide MRRIC with an array of bird actions/scenarios for Round 2 consequences and trade-off discussion. Present Levels 1, 2 and 3 pallid actions to be implemented within an AM framework to MRRIC.
 - ii. Post-August:
 - Determine the array of bird actions/tools to carry forward for potential AM implementation, in consideration with the potential pallid actions.
 - Using the HC proxy results of the bird actions/scenarios, determine the human considerations that are substantially affected and would be used for further analysis. Present the approach for further HC objective and metric analysis to MRRIC/ISETR.
- b. November: Provide MRRIC with HC proxy results of potential pallid actions and discuss further detailed analysis of HC effects of bird actions.
- c. In addition to ongoing engagement throughout the Management Plan process, stakeholders will be informed and have the opportunity to comment with the publishing of the DEIS. As has been the case throughout this process, the Management Plan team will keep MRRIC members, ISETR, and ISAP abreast of developments.

2. Comment: Concerns with use of simplified proxies

- Simplification inherent in use of proxies may cause the optimal results to be eliminated

Rather than find the measure of “averageness,” use the **total**, which captures the entire distribution (of effects)

Response:

- a. A tremendous amount of time and effort has been dedicated by MRRIC and the agencies to develop the proxy metrics and to ensure they best represent the various interests and concerns of stakeholders while also reflecting and supporting a defensible technical analysis. We are working closely with MRRIC to consider each proxy uniquely and to communicate and display effects to human considerations in ways that are responsive to stakeholder requests and comments. We have not focused on “finding the measure of averageness”, rather we have been displaying a range of statistical outputs in order to provide a clear picture of the distribution of potential effects among various actions using mean, median, best and worst 10% of years, and maximum and minimum over the period of record for the various proxy metrics. In addition, the Hydro Visualization (Hydro-Viz) tool allows the opportunity to examine stages and flows at any point over the 82 year period of record to understand the hydrological and hydraulic differences among the species actions.
- b. For the Round 2 “bird actions” consequences and trade-offs interaction, totals for the proxy metrics will be included with the results as an additional metric to capture the distribution of effects. The statistic for the worst 10% of years will also be modified to represent the average of the 8 worst years over the period of record specific for each proxy metric as suggested during the May MRRIC meeting, rather than the 10th percentile year.

3. Comment: Relationship between Proxies and Final Metrics

- Need to make transition from proxies as place holders to final metrics transparent

Response:

- a. The agencies have strived to maintain openness and transparency with stakeholders throughout the entire process and will continue to do so. Once the alternatives are fully determined, the agencies agree it will be important to be clear and transparent in the transition from proxies to final metrics.

- Will proxies for some concerns be used simultaneously with final metrics for other concerns?

Response:

- a. Based on the resources and geographic areas that appear to have the most potential for impacts using the proxy metrics, the final metrics will reflect the HC objectives and performance metrics as recommended by MRRIC. The agencies can provide additional input if requested by MRRIC to help in further understanding the potential HC effects.
- What if final metrics lead to different conclusions than proxies?

Response:

- a. It is not anticipated that the final metrics would lead to different conclusions than proxy metrics since the proxies are intermediate calculations to the final metrics. The final metrics will provide additional insight on the costs, benefits, and magnitudes of impacts affecting HC interests.
- How will the agencies compare results for each and how accepting will stakeholders be of them?

Response:

- a. The agencies will follow NEPA and USACE planning guidance for evaluating effects to alternatives and will provide documentation in the draft and final EIS. The methods and models planned for HC evaluation are detailed in the “Draft Framework for Human Considerations Objectives and Performance Metrics and Associated Modeling/Methodology, June 2014.” Using PrOACT, the agencies have intensely coordinated and engaged with MRRIC since the onset seeking and incorporating MRRIC input as well as working to ensure a clear understanding of the process and steps involved to arrive at results and decisions. The agencies continue to put forth a transparent, good faith effort with MRRIC and believe that committee members have responded in kind.

4. Comment: Need to transition sooner from HC Proxies to Final Metrics in selection of alternatives to be carried forward

- HC Proxies use of averages and number of times certain thresholds are exceeded. These are not always good indicators of the **magnitude** of the impacts that their corresponding final metrics reflect.

For example, economic metrics reflect magnitudes of effects (# of people affected, size of facility, number of acres).

Use of some revised proxies at May meeting addressed this issue to some extent, but Final Metrics are needed sooner (perhaps prioritize power, recreation, irrigation –easier to develop)

Response:

- a. Given feedback from MRRIC and the ISETR, the agencies have included an array of metrics/statistics (as noted in comment 2) to understand potential HC effects and have refined a number of proxies to better reflect the magnitude of HC effects including: population served for municipal water supply, number of irrigated acres for irrigation, total boat ramp access days for recreation, generation value for hydropower, and gross megawatt capacity for thermal power. As noted above, for the Round 2 “Bird actions” consequences and trade-offs interaction, proxy metric “totals” will be calculated to provide another metric to capture the distribution and potential magnitude of effects. In addition, updates to the Hydro-Viz tool have been made to better illustrate and communicate the changes in frequency and magnitude of stages and flows among the different scenarios.
- b. For some interest areas, parameters that account for magnitude are more easily incorporated; however, some of the interest areas involve more complex analyses. The preliminary results based on a "quick" monetary analysis of, for example, lost power generation with energy or capacity values or lost value of irrigated acres, may not reflect the true economic cost/loss in value of the plants' or irrigators' behavioral response to a change in conditions. Impacted resources will require a survey of experts or representatives to evaluate how they would respond (i.e., irrigators may switch to dryland farming or have a substitute source of water, power plants may run at decreased efficiency for a period of time before installing cooling systems/ponds, etc.). A quick analysis may not reflect actual responses to the changing river and system conditions and therefore, would not be a prudent reflection of economic impacts for Round 2 consequences and trade-offs.
- c. With that being said, the agencies have developed an objective process using proxies to evaluate all resources through the Round 2 bird discussion. After that point, we will move into a more robust socioeconomic analysis that will look at the HC resources and geographic areas that appear to have the most potential for impacts from the bird actions (as noted above if there is no change in a proxy

for the alternatives evaluated, detailed analysis may not be warranted for the related HC objectives and metrics).

5. Comment: Need to transition sooner from HC Proxies to Final Metrics... (cont'd.)

- Time required to perform the HC Final Metrics (data collection, model building, analysis) is substantial for some metrics & needs to start soon.
 - It may take more time to implement Final Metrics than expected, and this may result in continued use of HC proxies.
 - Perhaps prioritize which HC Final Metrics to develop/use first based on which HC Proxies are showing major differences across Alternatives being evaluated for May meeting.

Response:

- a. The agencies understand the complexities involved in the evaluation of the HC objectives and metrics and have already spent considerable time assessing and detailing the proposed methods and models to be used in the HC evaluation of final metrics (“Draft Framework for Human Considerations Objectives and Performance Metrics and Associated Modeling/Methodology, June 2014”). As the agencies have previously communicated, given the evolving framework for birds and pallid actions, once a more robust set of alternatives are determined, the team will conduct more detailed economic analysis for the human considerations. During the assessment of potential bird actions for Rounds 1 and 2, the proxies and the Hydro-Viz tool provide an indication of the relative change in probability / frequency of effects at various locations and points along the river, as well as, help inform the formulation process and refinement of actions to create fully developed alternatives. The agencies agree that the proxies can help identify and prioritize which final metrics to evaluate based on which HC proxies are showing major differences across alternatives.

6. Comment: Need to transition sooner from HC Proxies to Final Metrics... (cont'd.)

- Although screening using the proxy results is appropriate, there are significant risks that better alternatives are screened out of “Final” Alternatives and poorer alternatives are carried forward to “Final” Alternatives based on the simplified HC proxies. Earliest possible use of more sophisticated metrics may reduce this risk.

Response:

- a. The agencies are using best available information to assess affects of potential management actions during Rounds 1 and 2 consequences and trade-offs discussions with MRRIC. The proxy metrics are calculated as an intermediate step in the process of conducting the more detailed analysis for the final HC objectives and metrics. Because of this the proxy metrics illustrate directly the relative extent to which changes in the system affect the HC interests. With the addition of a number of updates and more sophisticated metrics, the agencies do not anticipate significant risks associated with the screening of actions/alternatives. The agencies will clearly document and communicate the criteria and rationale used for screening alternatives as part of the EIS.

7. Comment: Considering full range of potential actions?

- Considering the full range of potential management actions for proxy evaluation is important to assessing and keeping in perspective the range of response

Response:

- a. Concur. As the ISAP and MRRIC recommended, we are focusing on the needs of listed species, using a comprehensive, science-based approach to determine possible management actions. The agencies will demonstrate that a thoughtful and deliberative look at the actions has occurred and clearly explain in the EIS why some were not recommended for implementation. MRRIC's feedback on the impacts—as demonstrated by the proxies and the members' experiences—will be extremely useful in determining what actions move forward. Additionally, the National Environmental Policy Act (NEPA) requires the lead agency to rigorously explore and objectively evaluate all reasonable alternatives, including reasonable alternatives not within the jurisdiction of the lead agency. An alternative that is outside the legal jurisdiction of the lead agency must still be analyzed in the EIS if it is reasonable. A potential conflict with local or federal law does not necessarily render an alternative unreasonable, although such conflicts must be considered. Alternatives that are outside the scope of what Congress has approved or funded must still be evaluated in the EIS if they are reasonable, because the EIS may serve as the basis for modifying the Congressional approval or funding in light of NEPA's goals and policies.
- Consider alternative management hypotheses in potential actions, e.g., removal of invasive species to benefit pallid sturgeon, off-channel habitat for birds

Response:

- a. The management actions being considered are derived from the Effect Analysis. A range of each of these management actions is being considered in alternative development.
 - b. The Effects Analysis team has considered the potential for invasive species, in particular the Asian Carp, to either directly affect the pallid sturgeon (e.g., predation) or to compete with the pallid sturgeon for resources. Based on that expert assessment of the best available science, invasive species were not believed to be a key factor in sturgeon declines (those hypotheses remain in the Reserve however). These conclusions were based in part on the following considerations. The appearance of Asian carp (other than common carp) in large numbers began in 1993 long after sturgeon declines occurred. These filter-feeding fish are not believed to prey on larval or young pallid sturgeon but consume plankton, limiting chances for predation and competition. While the invasive Asian Carp is an issue that needs to be addressed in the Missouri River basin for a number of reasons, at this point the evidence is not compelling that Asian carp are a significant cause of pallid sturgeon declines. That understanding could change, however, and the process for incorporating new understanding into management decisions will be described in the AM Plan.
 - c. Off-Channel Bird Habitat – The U.S. Fish and Wildlife Service acknowledge this comment and will be responding to this comment in a separate document.
- Budget should not constrain at this point (may raise societal cost of meeting recovery goal)

Response:

- a. Budget is not considered a constraint in the formulation and evaluation of alternatives at this point.

8. Comment: Distribution of costs?

- Show the distribution of costs and benefits within/outside the basin when comparing across alternatives (NED, RED)
- Potential legal challenge/defense costs of some alternatives; implications of concentrating costs vs spreading costs

Response:

- a. As reflected in the set of HC Objectives and Metrics, the USACE will consider the distribution of costs and benefits when comparing across alternatives (NED, RED, OSE, EQ). The agencies will follow NEPA and USACE planning guidance for evaluating effects of alternatives and will provide documentation in the draft and final EIS. The acceptability of the alternatives will also be discussed as part of the EIS.

9. Comment: Uniqueness of each year

- Each historic year is unique in terms of where and when the rain/snow fell, the only thing we can be sure of is that no one year will ever be repeated

Response:

- a. It is important to keep the purpose for using proxy metrics in mind as we work through the consequences and tradeoffs discussion with MRRIC. The proxies allow stakeholders to compare effects across potential actions/alternatives.
- b. While no one year is exactly like another, a long period of record that contains extreme events (floods and droughts) is the best basis for assessing impacts of operational/management decisions on both a temporal and spatial scale. This study elected to use past historic information to realistically reflect basin conditions for a wide range of events. The historic river gage record provides a lengthy and robust data source.
- c. To represent a variety of flow conditions that are reflective of the basin, the Management Plan HH PDT has developed an 82 year Period of Record (POR) from 1930 to 2012 based on historic gage records/data. The POR is an extensive record that includes a wide range of events including the 1930's drought and significant flood events such as 1952, 1993, and 2011.
- d. The POR flows are adjusted based on Bureau of Reclamation water use (depletion) estimates to the current year 2012 to account for water that is removed from the system in current conditions via irrigation, water supply, etc. This standardizes the POR so that all POR depletions are based on current day water use levels. The POR flows are then used with HEC-ResSim models to assess current and alternative condition hydrologic variability within the Missouri River basin.
- e. Existing Conditions HEC-ResSim models were developed to reflect the current reservoir operation manuals for the six Missouri River mainstem dams and also relevant tributary dams. The operating criteria associated with each dam and system operational requirements provide the basis for the ResSim model system

operation simulation over a variety of flow conditions to meet authorized purposes and downstream requirements.

- Years are also differentiated in the simulations based on whether the flow levels in the previous year created enough habitat

Response:

- a. That is correct. The main reason for this check is that flow releases that create emergent sandbar habitat (ESH) can also erode ESH that is present. Based on input by the EA team leads for Terns & Plovers and Geomorphology, the simulation was set up to run a Spring or Fall ESH creation release four years following the previous ESH creation release (if other conditions allow i.e. full service level or below flood control constraints), whether that ESH creation release was released solely to create ESH or to evacuate stored flood water. More frequent ESH creation releases were thought to be less than optimum at creating and sustaining ESH.
- b. The ResSim model includes an evaluation of system storage levels, authorized purposes, and habitat objectives to determine reservoir operation decisions. Therefore, previous year operations are included as the ResSim model tracks system levels.
- c. The ResSim model follows the Master Manual criterion that outlines current reservoir operations for the six mainstem dams and reservoirs. There are numerous constraints and thresholds in the Master Manual that govern when releases are made or water is stored to meet authorized purposes on the river (i.e., navigation, water supply, hydropower, agricultural, environmental, etc). For proposed Management Plan alternatives that affect system operations, these constraints have been adjusted or modified in concert with proposed actions such as Spring or Fall ESH creation releases Oahe Unbalancing, or Low Summer Flows. These alternatives are intended to assess potential benefits to the Least Tern, Piping Plover, and Pallid Sturgeon as well as the impacts to existing authorized purposes and associated Human Considerations proxies.
- d. To determine the frequency of occurrence of the Spring or Fall ESH creation releases (i.e., every year, every four years, etc), an additional constraint was used in the HEC-ResSim models to reflect the need for creation of new emergent sandbar habitat (ESH). This constraint was based on Effects Analysis discharge versus duration ESH tables, with a minimum threshold of flows in the previous 4 years as a surrogate for created habitat. In other words, the HEC-ResSim models

for the Spring or Fall ESH creation releases check the previous 4 years of flows and if ESH habitat was already created, then the Spring or Fall ESH creation releases would not occur.

- Implications
 - This explains anomalies such as a reduction in flood risk despite spring or fall pulses, it just happened to be true that releasing water in a pulse year reduced flooding the following year

Response:

- a. Again, it is important to use the modeling results to compare alternatives. The purpose of the modeling is not to optimize system regulation or to explore extreme hydrologic occurrences. The purpose is to simulate a variety of management actions that could benefit the species, approximate the impact of those actions on human considerations, and compare the results. Any anomalies in the modeling are consistent throughout all the alternatives.
 - b. Management Plan alternatives that affect system operation may alter system storage levels. Since many Master Manual operation decisions are based on storage levels, the system releases in future years may be affected by available water in storage. While examination of individual years illustrate differences as system operation levels vary, it is critical to examine all years to accurately evaluate alternative impacts.
 - c. Management Plan alternatives that affect system releases and storage levels (i.e. Spring or Fall ESH creation) can provide mixed impacts based on how Master Manual system operation rules are followed in the future. For instance, if drought occurs following the high release period, then there is a potential that lower storage levels could reduce releases with resulting impacts to authorized purposes such as hydropower, water supply, and navigation. Conversely, if a high inflow period follows, then there is a potential for increased benefits to authorized purposes that benefit from additional system storage such as flood risk management.
- If there is a specific set of events of concern (such as area wide precipitation in a pulse year) there is no guarantee that this is modeled, in fact is likely that this has not been modeled

Response:

- a. Concur. This risk exists and will be acknowledged and addressed in the EIS. As this has been identified and discussed, it cannot be properly evaluated with the current modeling methodology. To run a scenario such as what has been proposed and to assign it a probability of occurrence can be done but would require a complex computer simulation that would require additional time and resources.

However, keep in mind that the Spring or Fall ESH creation releases are structured to not occur if an event "such as area wide precipitation in a pulse year" would result in the downstream flood control constraints being exceeded. If an event "such as area wide precipitation in a pulse year" occurs and this results in the downstream flood control constraints being exceeded following initiation of the Spring or Fall ESH creation release, the release would be cut back until downstream flood control constraints are no longer exceeded or Gavins Point releases reach current Master Manual service levels. We recognize this scenario would result in an increased risk of higher stages downstream due to travel time between Gavins Point and the downstream locations.

- b. The ResSim and HEC-RAS tools provide the necessary models for an evaluation that follows acceptable hydrologic methods. However, due to the infrequency of ESH creation releases which results in a small sample size, additional evaluation of potential impacts may be necessary (see bullet f. below). The need for detailed evaluation of ESH creation release impacts and the preferred methodology will be further evaluated if any of those options proceed further within the Management Plan study.
- c. Tributary runoff is included in the POR analysis. Thus, the current evaluation methodology does provide information regarding the risk of any ESH creation release aggravating downstream flood conditions.
- d. The ResSim model has flood control constraints consistent with the Master Manual (Table 7-8) 60 kcfs service level. Alteration of the flood control constraint was necessary to achieve ESH creation releases. Attachment 1 to this document provides an example of how flood control constraints are altered with proposed releases. HC proxies reflect impacts of operational changes that result in higher flood damages and impacts in future years due to system storage changes.
- e. Flood control constraints that are included in the ResSim model will limit differences between the existing condition and simulated condition. When system operation is controlled by system storage levels or extreme event inflows, downstream river level differences between the existing and pulse conditions will be comparable.

- f. The Management Plan HH PDT will prepare a response paper that further evaluates ESH creation releases in more detail. This will examine years when the ESH creation releases did not occur at all due to high water inflow periods (such as in 1993) as well as years when the release was reduced or terminated due to high downstream inflow after initiation. The evaluation will assess water surface elevation changes/increases at target locations for the above scenarios to determine if lagged impacts are occurring as a result of the release changes. These evaluations will also provide information regarding the need for more detailed analysis.

10. Comment: Uniqueness of each year, cont'd

- It is not appropriate to use the visualization tool for 1993 or 2011 to visualize flood risk; this is true because no pulse was used in those years

Response:

- a. The Hydro Visualization Tool illustrates model results from all years. As stated above, habitat-creating flow releases are not attempted every year. In 1993 and 2011, flood control constraints incorporated in ResSim prevented the habitat-creating flows from being released.
- Given the results of the proxies, there is no point in doing flood risk modeling

Response:

- a. It is still important to conduct flood risk modeling since the preliminary Management Plan actions adjust and modify existing thresholds and constraints in the current Master Manual. For example, if a Flood Risk Management constraint at Omaha is increased by 10 kcfs from what is currently used in the Master Manual, then it would be a worthwhile endeavor to assess potential proxy differences, tradeoffs, and costs between increased ESH bird habitat and increased interior drainage or out of bank flooding. It is important that Human Consideration proxy results are validated for accuracy and have the appropriate level of detail for use with the one dimensional hydrologic and hydraulic models and associated outputs. For alternatives where Master Manual changes occur, it is important to compare HH outputs and proxy results to the No Action condition and determine if proposed actions result in negative or adverse impacts relative to the No Action condition.

11. Comment: Assumptions made in the models may distort the results

- The plover analysis used to design the alternatives only counts birds that nested in riverine areas
 - If birds nested in non riverine areas in 2012 and these birds were counted towards the success of riverine sandbars, then the plover model may overestimate the productivity of riverine habitat in that year

Response:

- a. The methodology for parameterizing the models and related assumptions are documented in the draft interim EA integrated report. The model for plover fledgling production on sandbars was parameterized using surveys of productivity on sandbars. Birds that fledged elsewhere, if any, would not be listed as originating from sandbars.
- If non riverine areas (e.g., gravel pits and land not recovered from the 2011 flood) can be used to provide less expensive habitat; if this is ignored, then it will bias economic results away from mechanical construction

Response:

- a. The U.S. Fish and Wildlife Service acknowledge the comment related to non-riverine areas and will be responding to this comment in a separate document.
- Ignoring the differences between known costs (mechanical construction) and unknown costs (flood risk) may bias results towards outcomes with unknown costs

Response:

- a. As noted above, the USACE will consider the distribution of costs when comparing across alternatives. The estimated costs of mechanical restoration will be included along with the costs and benefits associated with human considerations in the evaluation of the final array of alternatives.

12. Comment: Mechanical Restoration

- To date, little has been reported on evaluation of the cost of this potential action relative to flow actions
- The costs of mechanical restoration may well be comparable to the foregone hydropower and thermal power associated with some flow alternatives.

Response:

- a. The estimated costs of mechanical restoration will be reported as updated information becomes available and will be included along with the costs associated with human considerations in the evaluation of the final array of alternatives.

13. Comment: Compounding of errors

- There is enormous uncertainty about the true magnitude of the parameters used to generate the proxy results, the use of these parameters in serial model runs can create problems with compounding of errors

Response:

- a. As noted above, the agencies are using best available information to compute proxies and have been and will continue to be clear in identifying assumptions and uncertainties. The agencies will continue to ground-truth and review results and refine as we move through the process to further reduce potential errors or uncertainties. The Management Plan will also undergo open, dynamic, and rigorous review process. Technical, scientific and engineering information that is relied upon to support recommendations will be reviewed to ensure technical quality and practical application.

14. Comment: Communicating results –Push (1 of 2)

- Make assumptions and caveats explicit

Response:

- a. The agencies have been explicit with assumptions and caveats through the proxy metric information sheets as well as with the proxy result summary slides and appendices and will continue to clearly identify the assumptions and caveats. Please let the agencies know if the panel identifies any instances where this information appears to be missing.

- Watch consequences of rounding

e.g., changing from 1 to 1.3 days of flooding in KC becomes 1 day of flooding in both no action and flood scenarios, better to report a 30% increase in flood risk

Response:

- a. Given the proxy metrics have been developed in conjunction with MRRIC to assess HC effects, the agencies feel that the proxy metrics are sufficient in

reporting level/scale of effects and are not concerned with large rounding errors
misrepresenting differences in effects between actions.

15. Comment: Communicating results -Push (2 of 2)

- Create discrete proxies rather than bundling ambiguous results
It is better to separate out competing concerns rather than to assume they balance each other out

Response:

- a. The agencies and MRRIC have worked collaboratively in the development of the proxy metrics including distinguishing proxies as discrete to assist in providing clear outputs and results of actions. The following proxy metrics will be refined to better reflect discrete proxies and avoid potential bundling:
 - Cultural Resources proxy (specifically at the reservoirs): separating the cultural resource sites at risk of erosion from high pools from the cultural resource sites at risk of exposure from low pools.
 - Recreation boat ramp proxy: separate high and low operational elevations for boat ramps to distinguish low and high water impacts to boat ramp operability.
- To further reduce numbers overload and statistical confusion continue to create user friendly graphics summarizing results of the proxies (e.g., % bank full, cross sections, photo simulation)

Response:

- a. Compass and the USACE are working to provide additional graphics to illustrate the results of proxies and demonstrate differences among the alternatives. We welcome any suggestions the panel or MRRIC may have as ways to present and display the materials.
- Indicate pulse years on slides and vis tool

Response:

- a. The HEC-RES and PrOACT PDT are currently assessing which years during the POR the proposed Spring and Fall Releases occurred. This information will be shown in tabular format and also in the Hydro Viz Tool to help stakeholders see specific years when proposed Management Plan actions occurred.

16. Comment: Adaptive management

- Important to distinguish between risk and uncertainty
- Important to recognize external events, such as invasive species or natural events can perturb the system being managed

Response:

- a. The Adaptive Management (AM) Plan does distinguish between risk and uncertainty and will continue to develop our strategy for describing how we will address each in the AM Plan.
- b. The boundaries of our analyses and assessments are limited to the scope of our problem statement and what the USACE has the ability to affect. The ESH and bird models are stochastic, explicitly incorporating several forms of uncertainty including natural environmental variability (e.g. storms, temperature extremes, variability in quantity or quality of food) in addition to the variability seen in flows during the period of record. Monitoring programs can help determine when these events occur and their impacts on species during the management process; the monitoring associated with the AM plan will include measures to identify effects of external events and separate those from effects of management actions. We intend to continually improve models and understanding of those elements that directly affect species and their habitats.