Missouri River Recovery Program
Independent Social Economic Technical Review (ISETR)

ISETR Evaluation of the MRRMP AM Plan Version 5

September 1, 2016

Performed for:
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Performed by:
Missouri River Independent Social Economic Technical Review Panel
and Oak Ridge Associated Universities, Third Party Science Neutral

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Preface

This report presents the findings and recommendations of the Missouri River Recovery Implementation Committee (MRRIC) Independent Social Economic Technical Review (ISETR) Panel, a team of three independent experts selected for their expertise in agricultural economics, resource economics, natural resources management, and the use of these disciplines in decision making. The independent expert panel was selected by the Third Party Science Neutral (TPSN) with input from MRRIC, and was instructed to conduct its business according to procedures outlined in the "MRRIC ISAP Approach Structure Ground Rules." (ISETR was established subsequent to establishment of the Independent Science Advisory Panel (ISAP) and operates in a similar review and advisory capacity, following the same ground rules.)

At the request of MRRIC, the ISETR evaluated Human Considerations (HC) related components of the "Developmental Draft Version 5 Science and Adaptive Management Plan" (hereafter the AMP) dated May 2016, including its extensive appendices and attachments. These documents describe the most recent iteration of an evolving AMP, which along with an accompanying Environmental Impact Statement, will be an integral part of the Missouri River Recovery Management Plan (MRRMP) for management of three listed species under the Endangered Species Act, the piping plover, least tern, and pallid sturgeon.

The charge to the panel was developed by the MRRIC Human Considerations Ad Hoc Work Group including the lead agencies and in coordination with the TPSN. Because the HC components of version 5 of the AMP were not yet fully enough developed to enable full answers to the questions posed, the panelists were asked, in addition to answering the questions as well as they could, to provide a more open-ended "academic-style" review of Chapters 2, 5, and 6 of the plan, including general and specific comments on each chapter. Panel members discussed their ideas among themselves, then divided writing tasks by chapter and answered the charge questions according to expertise within each question. Panelists read, aggregated, commented on, and revised each response to the chapter reviews and charge questions. The TPSN reviewed later drafts, asked clarifying questions, offered suggestions, and provided an initial edit of the draft report delivered to MRRIC on July 26, 2016.

This final report represents the understanding and recommendations of the three independent experts following extensive discussion at the August MRRIC meeting with MRRIC members and with the AMP development team. It also benefits from written feedback on the draft report from several MRRIC members following the August meeting. The panel recognizes that work on the next iteration of the AMP is ongoing and looks forward to engaging with MRRIC and the authors on expected modifications and additions, especially to Chapter 5 on HC considerations. Findings and recommendations presented here generally are agreed to by all ISETR panelists.

Robb Turner, Third Party Science Neutral
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On June 9, 2016 MRRIC requested the ISETR panel "to provide an evaluation of the existing AMP v5 chapters 2, 5, and 6 that incorporates an academic-style review of the HC-related materials in chapters 2, 5, and 6, and strives to answer" eleven "…questions noted below to the extent that they can be answered given the current state of the AMP document development." This document is a response to that request. First, the three chapters are reviewed. For each chapter, both overview remarks and specific remarks, some of which expand on the overview remarks, have been generated. Second, as appropriate, responses from each of the three chapters are provided to each of the eleven questions.

ISTER recognizes the effort that has gone into producing the draft AMP version 5, and that while the draft is undergoing review the authors are already working on the next iteration.[1]

Review of Chapter 2 Governance of the AM Program

Overview remarks on Chapter 2

Chapter 2 sets out to provide salient aspects of the governance of the AM program. It begins with a brief and general discussion of concepts, such as governance, drawn from often unsourced materials from outside the MRRP experience (section 2.1). Perhaps the authors can better describe or distinguish in the next draft what is from outside sources and what is developed within the MRRP. Section 2.2 provides a reasonably clear and straight forward description of MRRP decision making, including what external factors, such as NEPA and the Master Manual, influence decision making. Section 2.3, describing the composition of different groups and their roles and responsibilities in executing the MRRP, reflects the extent to which the discussion to define MRRIC roles is still underway. Section 2.4 describes the processes involved in executing the MRRP. Not all of the salient concepts, such as attributes of governance introduced in section 2.1.2, are integrated fully into the discussion in this section. The authors explain on page 113 that "more detailed versions of the workflow process will be developed for the final draft of the AMP." Section 2.5 describes protocols and procedures. It is not always clear how the individual processes, such as the review process mentioned on line 30 of page 132, were derived. The discussion of how processes work in practice is at times overly optimistic and lacks an adequate explanation of how MRRIC fits in. Much of the detail provided in sections 2.4 and 2.5 belongs in an appendix rather than in the main body of the document.

[1] ISETR's understanding of the purpose and audience for the AMP increased greatly through discussions at the August 2016 MRRIC meeting. At that meeting the authors provided ISETR with a spreadsheet describing how in the forthcoming version of the AMP they already have revised, or intend to revise some of the AMP text in response to engagement with the AM Ad Hoc Group, ISETR, and others. It is difficult to evaluate a moving target. ISETR has revised some of the comments made about the initial draft in this final version based on feedback received on its draft report. At the same time, it has retained some comments and questions with the understanding they have been or will be incorporated by the authors into version 6 of the AMP.

It would be helpful if the chapter began with an overview of the remainder of the chapter including explaining how and why each of the subsequent sections inform the MRRP and are salient to the various participants in the AM process. The chapter would also benefit from highlighting in an appropriate section the key components of MRRIC engagement required to make the AMP successful.

It would be valuable to make explicit in the draft that the primary audience for the Adaptive Management Plan is the U.S. Army Corps of Engineers and the Fish and Wildlife Service. This would explain why this chapter is written with the expectation that it will be read by well-informed insiders. Yet even some of them may have insufficient knowledge of specifics to fully grasp all of the details presented. For example, on page 78 it says the "Technical Team may not be co-located." With whom may the Technical Team not be co-located?

A number of the figures and tables contain unclear content, yet they are an important source of information for those who do not read all of the text. Therefore it is important to pay particular attention to making all of the figures and tables clear and information rich.

The authors state that the materials presented "should be regarded as provisional and for the purpose of promoting discussion" (page 48). Such statements moving forward should describe the anticipated process of engagement and reference how MRRIC will provide input as a function of its charter and operating rules.

<u>Specific comments on Chapter 2</u>

1. Section 2.1, Definition, Principles and Key Attributes for Effective Governance
This section would benefit from the authors having the specific concerns and needs of the MRRP drive the entire discussion. It would be helpful to explain how the materials presented in the AMP were developed, referencing salient documentation or identifying what originated from the authors themselves as appropriate. For example, rather than listing what considerations are included in a definition without explaining from where these considerations come, provide a specific definition of governance and explain from where and how it was derived. In another example, Table 8 (page 50) presents generic factors enabling and inhibiting good governance of AM programs and does not relate them explicitly to MRRP or other document(s) from where the factors were derived.

2. 2.1.3 Ensuring objective and reliable science in the MRRP
What threats to process and its perception are there other than bias (page 51)?

3. 2.3 AM Program Composition, Roles, and Responsibilities
The following is key and should be highlighted at the outset because it determines what roles and responsibilities are feasible. "The MRRP is a collaborative effort amongst the USACE, USFWS and MRRIC. Notwithstanding the collaborative nature of the Program, the lead Agencies have statutory responsibilities that cannot be delegated. The role of MRRIC is similarly defined by relevant legislation (e.g., Sec. 5018 of WRDA, FACA) (p. 66)."

4. In the next iteration it would be helpful to avoid floating bubbles. See Figure 11 Overview of AM program composition (page 67). What is the relationship between the entities listed in each bubble?

5. It is constructive that discussion is underway to define MRRIC roles. Table 11 Summary of roles and responsibilities of entities involved with implementing the MRRP (page 68-69) is based on the current proposal that does not explain how MRRIC work groups fit. The table is about explaining the composition and primary roles and responsibilities for each entity. Consistency is needed to provide the composition and roles and responsibilities for MRRIC work groups to be included in the table.

6. Be consistent in table presentation. In Table 11 the entity column comes before the responsibilities column, in Table 12, Examples of decisions and responsibilities at the Oversight level, (page 71) this is reversed.

7. It is not completely clear from Figure 12 Schematic of decision makers with Oversight responsibilities, their senior support staff (ESC), and the Management Team (page 72) what positions are the points of contact for MRRIC.

8. It is anticipated that Table 13 Composition of the Management Team (page 73) will be updated to reflect AM Ad Hoc Group discussion July 13, 2016 and the straw proposal on governance presented at the August 2016 meeting of MRRIC.

9. 2.3.3 Bird and Fish Teams (Implementation Level)
In Table 15 Decisions, recommendations and other responsibilities of the Bird and Fish Teams (page 76), clarify what is the difference between responsibilities and other responsibilities?

10. 2.3.4 Technical support entities
As the chart is a means for people to tell at a glance how entities relate to each other, locate the Integrated Science Program (ISP) on the organization chart presented in this chapter rather than explaining it is not on the organizational chart (page 79). At a minimum refer readers to the discussion of ISP roles and explain why the ISP is not on the organizational chart.

11. Section 2.3.6 Overview of MRRIC roles and responsibilities
This is a key section for MRRIC members to understand the MRRIC mandate.

12. Figure 13 Schematic of MRRIC roles in implementing the MRRP AM Plan (page 84) does not indicate the nature of interactions and advice between the Independent Advisory Panels and subsets of MRRIC, such as the HC work group and bird and fish work groups. Explain that the interactions and advice envisioned for the panels is intended to remain as is.

13. “It is anticipated that WG members would need to devote up to a month of their time annually in order to effectively engage with the Teams, stay abreast of developments, prepare reports, etc.” page 86). Who will pay for this time?

14. Who will take on facilitating, recording and summarizing work group meetings when it is decided that a third-party facilitator is no longer needed? While there may be no need to address this immediately, it would be constructive to indicate what would trigger no longer using a third party.

15. It would be helpful to reiterate that MRRIC will decide on the composition and function of the work groups and that the AMP to the extent practical will take that into account. This document is not the place for untested assumptions and presumptions. For example, "The HC Work Group will presumably be a continuation of the existing HC ad hoc Work Group" (page 89) and "Further discussion should reveal the preferred approach and the added value (if any) of alternative configurations" (page 89). Where and with whom will this discussion take place?

16. "Note: Work Group members will be expected to commit to the time and effort necessary to effectively engage in the deliberations of the Teams. It will be important to establish reasonable expectations of members and enforce them. It is not yet clear if the members would be reimbursed for time, travel or other expenses associated with these efforts – doing so may necessitate limits on the number of members on each WG. Having facilitated meetings will also drain Program resources. A cost estimate for alternative manifestations of these concepts should be developed to help decide if requirements/restrictions for membership are needed, or if an open membership would suffice" (page 89). When and by whom will the above cost estimates be determined? If not everyone can participate, how will it be determined who can? It is important to acknowledge that where meetings take place may well determine who represents MRRIC on future teams and work groups. Providing funding for MRRIC members to participate in these meetings could alleviate some of this concern.

17. 2.3.6.3 Independent Science Advisory Panels
While the appendix or other documents may be more appropriate places than this section to detail the specific responsibilities of the Third Party Science Neutral (TPSN), it is important in the main body of the text to acknowledge key roles of this position.

Since 2010 the Third Party Science Neutral (TPSN) has engaged actively with MRRIC and its Work Groups to understand their needs, opportunities, and constraints. He has used that knowledge to guide the expert panels in their deliberations of charge questions and to ask clarifying questions and to make clarifying edits to their reports – translating technical information to make it understandable to a wide array of audiences. The TPSN is not a member of either expert panel, but his educational credentials and career experience in a wide range of expert reviews and assessments should enable him or her to speak the language of many disciplines and to interpret and translate among them. The TPSN does not write initial versions of panel responses or tell authors what to write, but rather engages closely with the authors in clarifying and improving their responses for understanding by the wide array of audiences in MRRIC.

18. The last two sentences on page 89 – "The Panel should be managed by a Third Party Science Neutral (TPSN) party that maintains Panel membership to ensure appropriate expertise is provided, receives tasks from the agencies or MRRIC, and ensures their activities are within legal mandates and the scope of the AMP. The TPSN should refrain from any reviews and

remain neutral on products of the Panel." – do not describe the TPSN roles adequately. For example, maintaining panel membership to ensure appropriate expertise and receiving tasks from the agencies or MRRIC are important but relatively minor roles played by the TPSN. Ensuring panel activities are within legal mandates and the scope of the AMP would be a new role though it is not clear it would be an appropriate one; this would seem to fall more within the scope of the Corps and/or USIECR. Activities contracted to the TPSN should already have been screened regarding legal mandates and scope.

19. Consider replacing the last two sentences on page 89 noted above, with words drawn from, or a reference to, the "Third Party Science Neutral Support to Establish an Independent Science Advisory Panel for the Missouri River Recovery Program," approved by MRRIC on July 21, 2010, (also known by its file name, "USACE MRRIC ISAP Approach Structure Ground Rules – FINAL MODIFIED"). This document states, the Corps' intent is "to establish a standing independent Science Advisory Panel for the MRRP and the MRRIC, utilizing the Third Party Science Neutral (TPSN) contracted by the US Institute for Environmental Conflict Resolution (USIECR), as a lead advisor for the management of scientific advisor selection, panel processes, and panel products." Subsequent pages of the document include processes and protocols for the TPSN's active engagement in all aspects of panel management, from selection of panelists to development of charge questions to how the panel works, including facilitation of "selection of panel chair, all panel deliberations, external panel interaction, and report preparation and dissemination."

20. 2.3.6.4 Interactions with MRRIC
What constitutes "resolving scientific uncertainties necessary to inform management decisions" (page 91)? Does scientific uncertainty include uncertainties associated with predicting HC impacts? ISETR believes there is uncertainty with regard to the magnitude of effects on economic sectors and the degree to which affected groups are able to adjust to those effects.

21. 2.4 AM Decision Process, Critical Engagements and Workflows
Are the six sought after attributes of the decision process (science-driven, collaborative, efficient, specific, comprehensive and transparent) listed in priority order (page 97)? What happens when there is a conflict among them? Is not learning an attribute of adaptive management that should be included? What about robustness?

22. The section is written in such a way that assumes the reader is already familiar with the Corps of Engineers decision process. At a minimum it would be worth reiterating that executing the AM Plan is predicated on understanding the Corps processes. It would be appropriate to refer individuals to the relevant Corps documents.

23. How many and where will Draft and Final Annual Operating (AOP) Meetings (page 98) be held? What determines how many and where? What happens to comments raised at these meetings? Will they be recorded? In what form will the responses be provided? At a minimum explain AOP meetings will function as they currently do, or how they might change under the AM process.

24. Why is it that in the list of milestones in the decision process some have dates assigned to them, such as draft AOP meetings in October and final AOP meetings in April, while other milestones, such as the annual AM workshop, do not (page 98-99)? At a minimum explain schedules are still under development or what could determine the dates.

25. The relationship of ISAP/ISETR to MRRIC is not clear in Figure 15 Overview of the science update process (page 103). What is the role of the expert panels in information flow?

26. Why is ISAP/ISETR not in Figure 16 Science update process timeline (page 104)? Consistent use of terminology would be helpful. For example, ISAP/ISETR is mentioned in Figures 14 and 15 yet in the text ISAP is more often than not mentioned alone. It would be useful in the next version to have a consistent use of the term that will be providing independent expert review during AM implementation.

27. How will the event provide "the attendees an opportunity to continue building trust in the process and maintain transparency in information sharing and decision making" (page 104)?

28. 2.4.3.1.3 Agenda
Clarify how the section on agenda (page 105) refers to a different meeting than the one in 2.4.3.2.3 Process on page 107.

29. 2.4.3.2 Annual AM Workshop
Are representatives of groups encouraged but not required to attend meetings, such as the AM workshop, responsible for paying their own way (page. 106)?

30. 2.4.3.2.3 Process
The bulk of the content in this section belongs in the appendix. For example, the following provides far more detail than is needed in the main body of the document. "Presentations will typically be 30 minutes with no more than 20 minutes allotted for presentation (15 minutes preferred), and no less than 10 minutes allotted to permit attendees to question the presenter" (page 107).

31. 2.4.5 Workflows for specific scenarios
This whole section belongs in the appendix.

32. The presentation and discussion of section 2.4.5 scenarios has been an educational process for MRRIC and the authors. It is premature for ISETR to evaluate the workflow process since a more detailed version is coming in the v6 draft of the AMP and "Independent panels, states and tribes acting in roles other than MRRIC, and the public are not currently represented in these diagrams, but will be added as the processes are further developed." (page 113)

33. Where does ISAP/ISTER fit in Figure 19 Workflow for decision to construct habitat with sufficient resources (page 114)?

34. Figure 21, Matrix of information flow among entities for the basic process of developing the Work Plan when construction actions only are included (page 118), depicts a chain of how

documented evidence is to be passed from one entity to the next. Are all relevant parties known and identified at this point? Might new relevant parties emerge? Where in the information flow do experts who are not in the entities in the chain provide input?

35. 2.4.5.5 Decision to scale up flow criteria or add a flow modification action
Figure 27, Workflow for decision to add or change a flow action (page 125), does not take into consideration that as decisions become more controversial there may well be more push back within and through MRRIC. At a minimum discussion of the figure should acknowledge that acceptance of the science (e.g., demand for greater certainty in the predicted outcome of a management action) may vary with the HC impacts associated with the management action.

36. 2.4.5.8 Decision to change species objectives, targets, or decision criteria
The option for MRRIC to make recommendations is depicted in previous diagrams of different workflow scenarios and there is inconsistent discussion of MRRIC doing so in the text.

37. The relationship between MRRIC and the different teams is not clear from all the figures of workflow. What is the relationship of MRRIC to each of the teams individually? What are the points of intervention for MRRIC?

38. 2.5.1 Procedures for changing the governance of the MRRP AM Program is an important section for MRRIC.
How was the review process determined? Is it based on a precedent from elsewhere? If so, where? A clear statement of who ultimately decides on whether or not to accept a change in governance would be helpful. Who decides when a rapid decision is required is much clearer than when there is more time available for making a change. To whom is the decision maker accountable? Is there an appeal process? Who may appeal? Is a periodic review of the governance structure built into the process? If so, at what intervals? Who undertakes the review? Why are there two different bodies adjudicating recommendations?

39. 2.5.2 Procedures for adjusting objectives, targets or decision criteria.
How were these procedures derived? Is there an appeal process if the Interagency Issue Resolution Group accepts or rejects a recommendation for adjusting objectives, targets or decision criteria?

40. 2.5.3 Procedures for addressing significant new information
Does significant new information refer only to biophysical information or does it include new HC information as well? How were these procedures derived? Is it based on a precedent from elsewhere? If so where?

41. 2.5.4 Procedures for dispute resolution
How were the procedures for dispute resolution determined? Are they based on a precedent from elsewhere? If so where? Will MRRIC be apprised of disputes between lead agencies? The procedures for dispute resolution outlined in the AMP reflect the ultimate authority and responsibility the lead agencies have. This emphasis on the lead agencies is reflected in the series of interagency groups such as Interagency In-Progress Review (IPR) and Interagency Issue Resolution Group. At this stage the involvement of the agencies and MRRIC is more of “inform”

level of collaboration. Only when the issue explicitly involves conflicts within MRRIC and/or between MRRIC and agencies is MRRIC formally engaged in the process via the MRRP Issue Resolution Group (the Chair of MRRIC now becomes a member of this group). This seems like a reasonable approach to the Panel. The process for an All Issue Resolution Group review being activated by nearly any group (e.g., an interagency team, an agency or MRRIC) is an important "safety valve" to bring issues forward within the collaborative framework. The elements of the request are also reasonable. The panel is particularly supportive of the 15 day time limit at each stage of "appeal" so as to prevent an appealing party from using the appeal process solely as a means to delay an action it regards as detrimental to its interest.

The primary concern of the panel about the procedures for dispute resolution is that when an issue gets elevated to higher and higher levels, the USFWS apparently is left out and only the COE has the final authority. It seems that these highest level decisions should be made jointly or at least involve consultation with USFWS as MRRP is an outcome of the ESA. For example, the panel believes the Director of USFWS should be involved as the counterpart of the USACE Chief of Engineers. Likewise if an issue is elevated to the Assistant Secretary of the Army for Civil Works, the equivalent level would be the U.S. Department of Interior Assistant Secretary over USFWS.

The adaptive management plan with its emphasis on consultation and learning would benefit from further emphasizing what measures can be taken to reduce the likelihood that MRRIC members do not understand the logic of specific evidence-based decisions. This might involve providing sufficient explanation within existing mechanisms of MRRIC engagement that draws on expertise both within the agencies and outside the agencies, such as the expert panels and providing additional opportunities for education and exchange, such as webinars.

42. 2.5.5 Procedures for resurrecting reserve hypotheses
How were the procedures determined? Are they based on a precedent from elsewhere? If so where? What constitutes a "priority threshold" below which a hypothesis remains in reserve status? How was it determined? It is appropriate to address these questions here with reference to other documents where they have been considered previously.
Having a process for promoting and demoting hypotheses is fundamentally sound, reflecting both the learning that takes place through commissioned scientific investigation and the reality of limited funding. What would be helpful is to create as transparent a process as possible for delineating what constitutes a priority threshold and why it may change.

43. 2.5.6 Independent external review
How will MRRIC be apprised of the various reviews?

44. 2.5.6.4 Independent External Peer Review of the MRRP
How was it determined that an Independent External Peer Review (IEPR) of the MRRP should be held after its third and sixth year of operation (page 138)? While there is mention of ISAP review there is no mention of expertise in Human Considerations.

45. 2.5.7 Requirements for research, monitoring and assessment efforts
It is difficult to assess the process when important subsections, such as this one, remain incomplete (page 139). Who needs to know the details of PI report writing?

46. 2.5.7.3 Research project management plan
It is not always clear who is to undertake what and with input, if any, from whom. Who will monitor and evaluate whether the requirements of a research project management plan have been defined adequately, the expected outcomes have been achieved and the extent to which the plan guides project execution and control? How and when will they do so? If there are significant deviations from the PMP who should the ISP manager inform? Are all deviations considered acceptable with the only requirement to be that they are reported?

Review of Chapter 5 Human Considerations

Overview remarks on Chapter 5

This chapter exists to ensure that actions designed to benefit the listed species also are designed to minimize impacts on human considerations. Implicit in this chapter is that the needs of the species are often in conflict with the interests of at least some of the stakeholders. It is also true that the interests of stakeholders can be in conflict with each other. Therefore, a major purpose of this chapter is to provide a basis for avoiding conflict or for conflict resolution. Importantly, almost all of the anticipated actions involve uncertainty, in both the benefits to the species and the potential impacts on human considerations. Therefore, the plan needs to provide a way to make tradeoffs under uncertainty and to reduce uncertainty as the plan is adapted and improved. The authors of this version of the plan were handicapped in that it was written before documentation of the detailed economic analysis was available. Without knowing which HC metrics may be of most concern for the various alternatives being considered, the authors were forced to write this chapter in a vague manner. What follows is a set of constructive comments designed to help the subsequent version's chapter better describe how impacts to human considerations can be minimized while meeting the needs of the listed species. One overarching suggestion for the AMP team to consider would be inclusion in this chapter of a recommendation for a "fine resolution" effects analysis when individual site-specific management actions are to be undertaken. In contrast to the necessarily rather coarse impact analysis of broad alternatives in the EIS, a fine resolution analysis would evaluate different designs, timing, and intensity of the birds/fish management action to determine which specific action at this location would meet the needs of the species while minimizing or at least not resulting in disproportionate harm to particular HCs. This "micro-scale" analysis might result in slight changes in the bird/fish management actions that would result in significantly less HC impacts.

Specific comments on Chapter 5

1. Chapter five has a five-page preface and almost forty pages of text. This is likely to grow as more detail on metrics, monitoring, and assessment techniques are added. These details will need to be summarized clearly for inclusion in Chapter 1 in a form that can be understood by the majority of readers. Chapter 5 could benefit from a more extensive introduction that lays out the

key features and conclusions. ISETR supports the idea for an Executive Summary like document intended for MRRIC members and others who will not read the full AMP.

2. Sections 5.1.1.1, 5.1.1.2 and 5.1.1.3 provide useful institutional detail on the evolution of the master manual and the way this manual deals with, or fails to deal with human considerations. This material could be summarized and the details moved to an appendix.

3. Chapter 5 should acknowledge up front that the interests of some stakeholders will be at odds with others and that the interests of the species may be at odds with some of the stakeholders. By acknowledging the potential need for tradeoffs, more attention in Chapter 5 could be on how these tradeoffs are to be made as the AM evolves from the necessarily programmatic nature of the DEIS toward specific implementation of projects.

4. Although alluded to in several places, the chapter does not propose a metric, or suite of metrics, to be used to help make decisions. While there are many possible decision metrics, monetizing as many metrics in terms of dollars and allowing those that are not monetizable (e.g., cultural resources) to be treated as constraints may help to sort out superior projects (e.g., specific actions in specific places) from inferior projects. Other quantitative metrics could involve indices created by calculating percentage changes in goal variables (e.g., ESH) with percentage changes in management actions (e.g., cfs, acre feet of water, etc.). Discussions at the MRRIC meeting and comments on an earlier draft suggest this latter approach is already under investigation. ISETR encourages further investigations with this approach.

5. "This does not necessarily mean that ESA objectives dominate any other factor at all times – situations may arise where planned actions could give rise to entirely disproportionate actions to HCs" (page 372). This section needs to be expanded to explain how to determine what constitutes a disproportionate action to HCs. What is the metric for this and how is it to be used in decision-making? How does this relate to minimizing impacts on HCs or achieving a cost effective result? A potential starting point for developing these quantitative metrics is the "Human Considerations (HC) Objectives and Performance Metrics reports from 2014. While this document is discussed in Chapter 5 (and the four primary accounts listed), more could be (and perhaps will be) said once the DEIS economic analysis is firmed up. At this point the discussion is limited to page 377, lines 18-19 which do mention the use of HC thresholds and Section 5.3.9.1 which discusses HC critical thresholds for decision making.

6. On page 369 the following statement is made about using the detailed economic analysis. "However, precise predictions of how particular actions may affect specific HC's in any given year cannot be made using these methods." This conclusion is premature given that we do not yet know what these results and models look like. It may be that some of the key models can be run for a wide range of input variables to provide a sensitivity analysis. This analysis could then be used to evaluate actions that fall within the evaluated range without the need to rerun the full model. A minor point, the tense used on this page is incorrect because these model results are not yet available.

7. Also on page 369 "…methods may need to be developed to integrate select HC indicators into operational models." This is one of the key objectives of the chapter and yet it is allocated only

five lines and no attempt is made to explain how this is to be achieved. From the written comments we received and discussions at the meeting apparently this section will be expanded.

8. Page 375. Section 5.3.2.2 proposes a way to choose among equal alternatives to achieve the species goals. Surprisingly this section does not provide a method to do this. It seems reasonable that the selected action should involve the least costly way to achieve the goal, other factors being equal. From the written comments we received and discussions at the meeting apparently this section will be updated.

9. Page 378 lines 20 to 32 propose a way to back cast the models to evaluate the impact of a management action on a given HC. This is a very important point and much more detail is needed on how this is to be done. It seems likely that the provision of this information could potentially expose the Corps to legal liability and this should be factored in before making promises of this type.

10. Page 378 lines 3-7 propose an "options analysis". This concept needs to be fully explained.

11. Page 379 "…careful thought will need to be given to the selection and development of specific HC measures to monitor." This makes it seem that these HC measures will be chosen in the future. Instead they need to be part of this chapter and ISETR looks forward to seeing them in the next version of the AMP. However, we recognize that the HC measures to monitor may change over time if indicated by new information or if the type of management actions being implemented change.

12. Section 5.3.10.1 is an excellent idea and is very well written.

13. Pages 387 to 391. This section lacks specificity, in part because the detailed economic results are not yet available.

14. Pages 393 to 395. These examples are a great idea. They should be expanded to include flood risk.

15. The costs associated with some of the management actions may potentially be borne by a small group of stakeholders. The benefits of saving the species will be felt nationwide. The AM plan should recognize that stakeholder views of fairness may influence their willingness to bear costs. This chapter could draw on the benefits-received principle and might suggest that the distribution of costs be similar to the distribution of benefits. For example, when there is a choice of suitable management actions that address a species need in a particular location, preference be given to those management actions that spread the costs/burden out across groups in society that will receive the benefits rather than concentrate the costs. In order to do this, Chapter 5 should introduce the notion that attention should be paid to the distribution of the costs geographically and by economic sector.

16. Risk Aversion. Stakeholders are understandably concerned about risk. Given a choice between spending $10 million on mechanical construction and accepting a flood risk with an expected damage of $10 million, but a worst case scenario where losses are greater than $10

million, most stakeholders will choose the former. Tools to incorporate this risk aversion are widely available and should be used when evaluating tradeoffs.

Review of Chapter 6 Data Acquisition, Management, Reporting and Communications

Overview remarks on Chapter 6

- This chapter does a good job recognizing that Monitoring and Evaluation (M&E) are part of an AM action taken.
- This chapter is generally well thought out especially for birds and sturgeon, but pays limited attention to including Human Considerations (HC) effects in data acquisition, reporting and communications.
- At times there is insufficient recognition of budgetary and time constraints in setting reasonable data quality and reporting standards.

Specific comments on Chapter 6

1. Page 397, lines 8-10. This sentence overstates the importance of learning relative to ecological effectiveness. While learning is an important part of AM (especially for sturgeon), stakeholders (and USFWS) will prioritize ecological effectiveness as equally, if not more, important than learning. While there will be times that active AM may prioritize learning over near term ecological effectiveness, this should be an explicit decision at the Management Team level or higher.

2. Page 398. The writers of Chapter 6 should be complimented for drawing upon other agencies' experiences with AM in the Columbia Basin, Everglades, etc.

3. Page 399-400. The writers of Chapter 6 should be complimented on the recognition that data are collected to aid in decision making, especially with regards to "effectiveness monitoring". See Pages 402-403 on "Actionable Science" as well.

4. Pages 399-400. Good recognition of the literature on sample design, data collection and hypothesis testing procedures.

5. Page 402. Discussion of "Scale" in terms of system wide effects is addressed through a Monitoring Assessment Plan (MAP). Individual projects data collection must be consistent with the MAP unless a variance is granted.

6. Section 6.2 Monitoring and Data Acquisition: Pages 404-406. The discussion focuses primarily on pallid sturgeon and birds, with minimal attention (except for point #3) to Human Considerations. Point #3 and the chapter generally should explicitly consider direct HC effects metrics, not just hydrologic metrics that drive or affect HC metrics. With the preview of the DEIS scheduled in mid-November we hope this provides the writers of the v6 AMP an opportunity to more explicitly incorporate relevant HC metrics into the monitoring and data acquisition.

7. Section 6.4 Data Management: Page 410 and Figure 80. Human Considerations are not explicitly mentioned in this diagram and should be. It is our understanding from discussion at the August MRRIC meeting HC considerations will be added in the v6 AMP.

8. Section 6.5.4 QAPP Implementation responsibilities, page 425. While it is important to place emphasis on Quality Assurance/Quality Control (QA/QC) and be consistent with collaborating state and federal agency QA/QC requirements, these sections need to be tempered with recognition of federal government budget and time constraints. It is encouraging to see the procedures do allow for a variance to the standard procedures but this variance procedure should not become a burdensome procedure itself.

Responses to Questions Regarding Human Considerations (HC) and Adaptive Management Plan (AMP) v5 for Evaluation by the Independent Social and Economic Technical Review (ISETR) Panel (June 9 2016 Final version)

Note: ISETR responses to these questions are organized by treatment of the question as related to material in Chapters 2, 5, and 6. If a chapter is not mentioned in a response to a question below it is because material in that chapter is not applicable to the question.

Question #1: The fundamental objective of the MRRMP is to meet species objectives while minimizing impacts on human considerations. Does the AM Plan v5 identify and describe mechanisms for adjusting management actions to minimize HC impacts while meeting the species objectives? Does AMP v5 adequately address scientific uncertainty when assessing species response and HC impacts resulting from management actions?

Chapter 2 describes the processes involved in executing the MRRP. It provides a general discussion of what happens when resolution of differences at various levels or across various interests in the implementation process is required. This version of Chapter 2 lacks specificity that we believe is desirable in a document that will guide implementation of AM.

Chapter 5 does not yet contain a metric or metrics to be used for making tradeoffs or minimizing HC impacts. See Chapter 5 specific comments 4, 5 and 6. Nor does it yet have a list of measures to follow. See comment 12. In part this is due to the DEIS economic analyses not yet being available, and hence a lack of knowledge of what metric(s) and processes may be appropriate for use in representing and making tradeoffs between species objectives and HC impacts. Only with one or more quantitative metrics is it possible to go beyond generalities and be specific about what constitutes a disproportionate impact to HCs, and to define specific mechanisms and processes for minimizing them. For example, a possible metric would be dollars of cost per acre of quality-equivalent habitat created. A management action that had higher dollar costs per quality-equivalent habitat (e.g., the USACE's Average Annual Habitat Units—AAHU) would not be chosen without additional justification for why that action was superior to a management action with lower dollar costs per AAHU (e.g., the action allowed for greater opportunities for learning that has future value).

A possible metric to use, at least to illustrate the principle, could be some form of cost-effectiveness in terms of habitat (ESH) or expected incremental percentage changes in species populations (or some index or proxy for this) with each additional unit of management action (e.g., acres of habitat, acre feet of water, cfs). Proxies used in the PrOACT consequences and tradeoffs exercise, or metrics from the "Human Considerations (HC) Objectives, Metrics, Methods and Models" report from 2014 could also be used as a source for HC metrics. The preview of the HC economic analysis in November will provide an opportunity to rapidly make progress on incorporating specific quantitative HC metrics in the AMP. Nonetheless at this stage, thought should be given to identifying innovative techniques for relating predicted or observed HC impacts to actions to benefit the listed species in a way that they can be minimized through a collaborative tradeoff analysis. Means of evaluating and characterizing uncertainty, both in species response and HC impacts, will need to be built into those techniques.

Chapter 6 begins to describe the infrastructure needed to communicate to the Management team, Agency Leadership team and MRRIC whether the management actions undertaken for the species are achieving the expected results (effectiveness monitoring) and what the impacts are on HCs. While there is some recognition of monitoring the effect of the management actions on HCs (page 406), discussion of information needs for assessing HC effects receives far less attention than for the birds and fish. As the authors of Chapter 6 noted on page 407, some of this lack of HC detail is due to not yet having the results of the likely important HC effects that need to be monitored (i.e., the DEIS results).

There is recognition of the need to evaluate the results of system wide monitoring (Page 403) so this has the potential to evaluate HC effects that may be occurring outside of the immediate focal area of the management action on the species. As detailed in the general review of Chapter 6, the next version of the AMP V6 should develop a parallel HC monitoring effort that draws upon what agencies and stakeholders already collect, as well as noting HC information that needs to be monitored that is currently not collected. Specifically, it should include a table showing the HC impacts identified in the EIS, which of these are currently monitored and by whom, and identify the unmonitored HC impacts and lay out a plan to fill that gap. Selection of the system HC metrics to monitor should emphasize those that have an identifiable connection to agency management actions and either be: (a) minimally influenced by other outside events; or (b) have a well-developed method (e.g., a model) that allows for controlling for outside events unrelated to the management action's effect.

Question #2 Does AMP v5 adequately describe how MRRIC will participate in the analysis and interpretation of the results of HC metrics monitoring?

At present Chapter 2 does not address MRRIC's participation in the analysis and interpretation of the results of the HC metrics monitoring. Providing an adequate description of MRRIC's participation through the new HC Work Group, the proposed Fall Science meeting, the AM Workshop and annual MRRIC plenary could be used to clarify MRRIC participation in analysis (e.g., the HC Work Group) and interpretation (meeting and workshop).

Chapter 5 does not describe any formal mechanism to allow MRRIC to actively participate in the analysis of HC metrics modeling or monitoring beyond the usual "inform" level of engagement at the MRRIC meetings and webinars.

In Chapter 6, a MRRIC Data Subgroup is identified as part of the Information Technology Management (ITM) for some level of engagement at the early stages of designing the information system "infrastructure". Much of the communication on the results of monitoring is through distribution of work products (Table 50). Page 410 (page 80) indicates there will be an "online report card" which suggests MRRIC members will have readily available access to the monitoring results.

Question #3 Does AMP v5 describe how its governance structure/process and HC monitoring and assessment approach will provide and use information in the timeframes needed to implement AMP effectively?

Chapter 2 describes how the governance structure is currently envisioned and explains the annual cycle of what activities take place when and what are the external timelines, such as budgeting requirements, that dictate what happens when. Chapter 6 does not adequately tie provision of HC information to decision needs; there may be a disconnect between when data become available and when decisions need to be made.

Question #4 Does AMP version 5 identify and adequately explain how and through what mechanisms the full complement of program attributes and technical expertise will be amended and adjusted with new information and emerging opportunities and constraints under the proposed adaptive management regime?

Chapter 6 of AMP v5 does identify the need to "Develop a clear path from data to decisions." (Chapter 6, page 399). At the most general level, the concept of "doing, learning, and adjusting" underlies the entire AMP process (see pages 8-9). Chapter 6 is more specific in that it explicitly recognizes the need to "Develop 'if-then' decision rules" (Chapter 6, page 399) so that any needed changes in management actions can be performed in a timely manner. AMP v5 suggests that "pre-approved" changes would be covered in the EIS, while those outside of the EIS would need MRRIC engagement and a separate Environmental Assessment. Section 6.4.5 on page 419 on near term (1-3 years) new data and technology needs is a good start, but could go further by recognizing that as management actions are undertaken there is the potential to learn more about species and HC effects. Both of these suggest a mechanism is needed to update the type of technical expertise that may be required in the AMP. This should be made explicit in the AMP v6.

Question #5 Does AMP v5 adequately integrate HC effects monitoring, define HC decision thresholds, and identify specific actions that will be triggered when thresholds are crossed?

Thresholds are mentioned in Chapter 3, with specific reference to HC metrics on page 183. Triggers are mentioned in Chapter 4 (Section 4.2.1.3 Level 3 Actions, Targets and Decision Criteria and see Table 38), though there is no discussion of what would constitute sufficient consideration of socioeconomic effects. In Chapter 5, pages 379-380 there is mention that critical thresholds for decision making may necessitate factoring in multiple HC and species factors. A list of possible HC triggers or thresholds is then presented. While these seem reasonable (flood risk, boat ramps, intakes, water quality, economic impact) they are clearly meant to be illustrative rather than definitive triggers as no specific criteria are given. This may be in part since the detailed economic analyses for the DEIS were not yet completed when v5 was written. However, the illustrative examples on real time monitoring (pages 381 to 385) along with the concept of HC Indicators dashboard (Page 385, lines 2-11) suggests there is active consideration of HC effects monitoring in the AMP v5. ISETR suggests that more specificity is needed, and will hopefully be forthcoming with the next version of the AMP.

Question #6 Does AMP v5 describe in sufficient detail, a programmatic HC monitoring and assessment approach that is sufficiently rigorous to detect potential impacts to HCs and subsequently provide actionable information to guide adaptive management?

Chapter 5, especially Section 5.4.1 (Why monitor for HC impacts?) and Section 5.4.2 (Selecting what to monitor) provide the case for HC monitoring and criteria for selecting the key HC monitoring indicators, respectively. As noted in Chapter 5, these sections are general principles since the details of the DEIS analyses of potential impacts are not yet known to the AMP writing team. However, the examples for recreation, thermal power and water supply intakes are instructive. These examples suggest that deciding on HC monitoring indicators and protocols will be a significant undertaking that will need to be budgeted for.

As noted in the review of Chapter 6, especially Sections 6.2 Monitoring and Data Acquisition and Section 6.4 Data Management, Human Considerations is given little emphasis. This needs to be rectified as designing a Data Management system should include HCs right from the start and not be something cobbled on as an afterthought.

Question #7 Does AMP v5 adequately describe the process for collecting HC impact data from external sources, evaluating its reliability, and safeguarding any confidentiality? Does AMP v5 adequately describe how validated estimates from stakeholder input will be included? Is it clear whether/how an online system, complete with validation means, will be created and used for members to report effects on them? Is it clear whether/how members will be able to access monitoring results (real time flow/stage) and review assessment/interpretation of monitoring results?

While this set of questions is not addressed in chapter 2, the chapter on governance, clear answers to these questions would have implications for some of the content of chapter 2. Notably it would help indicate what types of, and what access to, information that MRRIC might use to contribute to specific teams engaged in executing the MRRP.

Chapter 5 (Section 5.2.10.2 on page 385) provides a one paragraph description of an overall real time "dashboard" that along with status of fish and birds, would provide a selected number of HC values for the current season and changes over time. This primarily serves as a place holder, and does not specifically address the issues raised by MRRIC in Question #7.

As noted in the review of Chapter 6 and in ISETR answer to Question #6, insufficient attention has been paid to HC impacts to answer Question #7 for HC. However, with regard to quality assurance/quality control (QA/QC) the chapter does devote a significant amount of attention to this topic in general, and for birds and fish in particular. Further, the discussion of System Status Data Acquisition and Analysis does mention Human Considerations (see page 406) and UASACE plans to work with stakeholders to seek a collaborative ambient water quality monitoring program to assess status and trends in parameters that may affect habitats and socio-economic values (see page 407). At this point all ISETR can conclude is that there is at least some awareness of the need for HC monitoring but little in the way of the level of detail reflected by MRRIC in Question #7.

Question #8 From your perspective, have HC monitoring metrics and decision processes been sufficiently described such that MRRIC members would be able to understand the monitoring results and how they will be used?

The question of whether MRRIC members would be able to understand monitoring results and how they will be used was not addressed explicitly in the discussion of decision processes in chapters 2, 5 or 6. There is potential for the authors to do this.

Question #9 Have protocols been identified for the archiving, retrieval, reporting, communicating, and updating of data regarding HC effects?

No, this information has not been developed. Would it be similar to what is discussed in Chapter 6 for the other resources such as birds and fish? There is a place holder specifically for this in Appendix H Monitoring and Assessment Protocols for Human Considerations, which currently consists of one page with a short note describing what will be in that appendix.

Question #10 Does the proposed HC Indicator Dashboard mentioned in AMP v5 Chapter 5 include the appropriate kinds of information, and does it appear MRRIC members will have adequate access to relevant data and the opportunity for feedback about data displayed in the Dashboard?

From the perspective of Chapter 5, the dashboard is just a concept at this point but it appears to envision information and the real-time methods that could potentially convey the information desired by MRRIC stakeholders (Also see Chapter 5 specific comments 7 and 8). What is not clear is the mechanism by which MRRIC members would have access to the data or formal mechanisms to provide feedback on the data. This needs to be addressed not only in Chapter 5, but also in Chapter 6 in the design of the IT infrastructure. In particular, built into the software should be a MRRIC feedback mechanism that allows MRRIC members to provide specific comments on the data that would be routed to the appropriate Work Team members (e.g., Bird, Fish, HC).

Question #11 Is it clear from AMP v5 how and with what other programs on the Missouri River (e.g., programs of the USACE, other federal agencies, states, tribes) the MRRP AMP will integrate (i.e., how the AMP will synergize and avoid conflicts with these other programs)?

Chapter 2 acknowledges the distinctive relationship of the tribes to the federal government and encourages tribes and the non-lead federal agencies to participate in MRRIC. It also provides a limited discussion of with what other programs the MRRP AMP will integrate. For example, Chapter 2 recognizes that AM must interface with existing federal agency requirements such as the USACE Civil Works budget cycle, Annual Operating Plan, and the Master Manual. Page 61 mentions "if an action included in the Record of Decision involved flows not consistent with the technical criteria in the Master Manual, modification of the Master Manual would be necessary". Details for how to change the Master Manual's technical criteria are presented in Appendix A Attachment 5.

Chapter 5 does not address mechanisms to achieve synergies or to resolve conflicts or tradeoffs between the species and stakeholders, among stakeholders, or with other programs and interest groups.

The purpose of the AMP is to preclude jeopardy to the listed species that is caused by the Corps' actions in managing the river. The AMP will only be successful to the extent that the AMP becomes well integrated with and a part of the daily decision making of all Corps programs that may be impacting the species' survival. This likely means a modified organizational culture and new ways of doing business for the Corps. Public and private organizations across the country slowly are recognizing and embracing tenets of "sustainability" in their planning, operations, and maintenance. The Corps has an opportunity to be a leader in this change with its implementation of an innovative Missouri River Recovery Adaptive Management Plan.