

USE OF INDEPENDENT SCIENCE REVIEW TO IMPROVE SCIENCE AND COLLABORATION DURING DEVELOPMENT AND IMPLEMENTATION OF ADAPTIVE MANAGEMENT ON THE MISSOURI RIVER

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Presentation Topics

- Brief background and the 2000/2003 Biological Opinion
- Impetus for change and need for independent science review
- Initial charge for independent science review and resulting decisions
- Ongoing role of independent science review during the development and implementation of adaptive management
- 2018 Biological Opinion
- Lessons learned



The 2003 BiOp prescribed actions for listed species (e.g. creation of 12,000-20,000 acres of shallow water for pallid sturgeon) but did not explicitly consider uncertainty in the effectiveness of the prescribed actions.



U.S. Fish and Wildlife Service 2003 Amendment to the 2000 Biological Opinion
on the
Operation of the Missouri River Main Stem Reservoir System,
Operation and Maintenance of the Missouri River Bank Stabilization
and Navigation Project,
and
Operation of the Kansas River Reservoir System

December 16, 2003



Need for Independent Science Review underscored by:

- **Skepticism** in the basin regarding the efficacy of ongoing management actions
- **Significant costs** associated with some management actions
- **Differing views** among scientists regarding factors driving these populations and **differing agendas** among the various state and federal agencies employing those scientists
- Need to **increase scientific rigor** to maximize likelihood of success
- Ongoing **collaboration** with congressionally-authorized stakeholder group (Missouri River Recovery Implementation Committee)



Current makeup of the Independent Science Advisory Panel

Robb Turner, Ph.D. (Third Party Science Neutral): Oak Ridge Associated Universities

-Chris Guy, Ph.D. (pallid sturgeon specialist): USGS, Montana State University

-Adrian Farmer, Ph.D. (piping plover, least tern specialist): Wild Ecological Solutions, Fort Collins

-Dennis Murphy, Ph.D. (conservation biologist): University of Nevada, Reno

-Steve Bartell, Ph.D. (quantitative ecologist): Cardno ENTRIX

-Gary Lamberti, Ph.D. (aquatic/riverine ecologist): Notre Dame University

-Will Graf, Ph.D. (geomorphologist, river hydrologist): University of South Carolina

Ad Hoc panelist(s): Barry Noon, Ph.D. (landscape ecologist): Colorado State University

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Process for review by the ISAP



1. Topics for ISAP review originate from USACE and/or MRRIC.
2. Lead agencies (USACE and USFWS) and MRRIC discuss and agree on charge questions.
3. Third Party Science Neutral (TPSN) develops proposal for the ISAP and coordinates the review logistics with the ISAP.
4. Several types of review are possible ranging from “Discuss and feedback” engagements to formal reviews.
5. USACE and/or USFWS respond to ISAP comments in person in front of stakeholders and/or in writing.
6. Opportunity is provided to stakeholders to ask questions of the ISAP and/or the agencies following each review

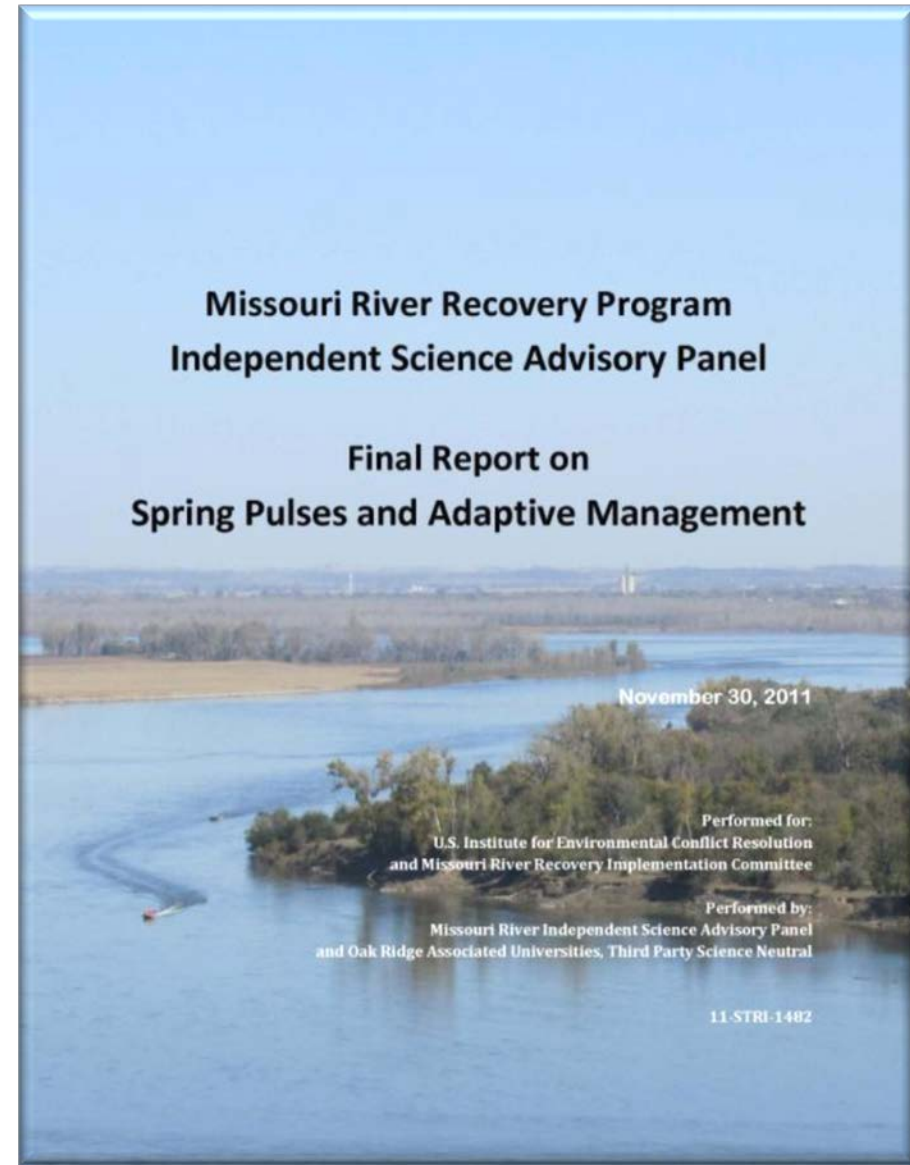


Type of engagement with the ISAP

- 1. Inform**
- 2. Discuss and Provide Feedback**
- 3. ISAP Initiated Communication**
- 4. Evaluate**



In 2010, the Independent Science Advisory Panel (ISAP) reviewed the ongoing spring pulse management action and ongoing adaptive management efforts for the MRRP.





ISAP Recommendations from 2011 (abbreviated)



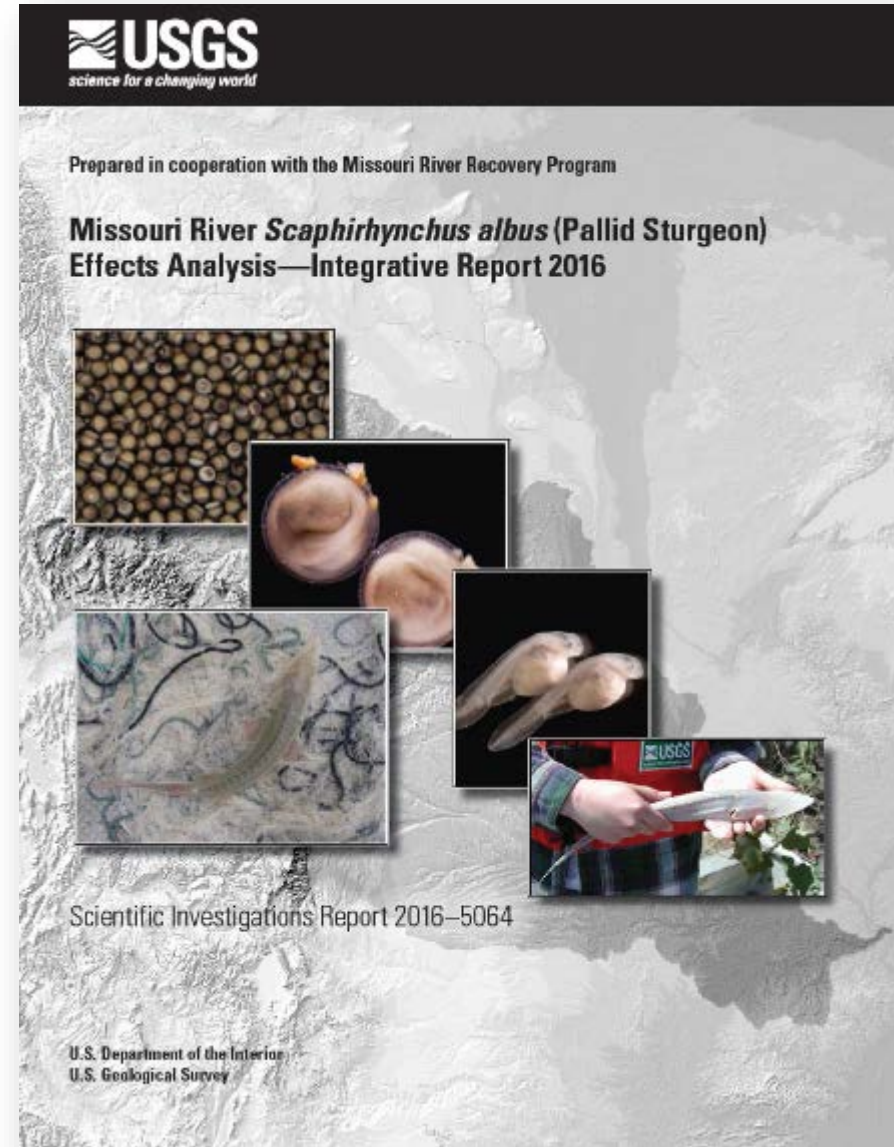
1. An **adaptive management plan** should be developed... and this plan should be used to guide future management actions, monitoring, research, and assessment activities.
2. The development of an adaptive management plan should be preceded by and based upon an **effects analysis** that incorporates new knowledge that has accrued since the 2003 Biological Opinion...
3. **Conceptual ecological models** should be developed for each of the three listed species and these models should articulate the pathways from management actions to species performance.
4. Baseflow restoration should be evaluated as a potential management action.
5. **Monitoring programs** along the lower Missouri River should be re-designed so as to determine if expected outcomes are attributable to specific management actions.
6. The agencies should identify **decision criteria** (trigger points) that will lead to continuing a management action or selecting a different management action...
7. Other managed flow programs and adaptive management plans should be evaluated as guiding models for the lower Missouri River recovery program.



Synthesis of best available information

-comprehensive, transparent, and peer reviewed

The **Effects Analysis** provides an integrated assessment of the potential benefits of management actions for pallid sturgeon in the Missouri River, **and documents uncertainties in that assessment.**





A Science and Adaptive Management Plan was developed for the MRRP by a multi-disciplined team in close collaboration with USACE, USFWS, and stakeholders, and with frequent review from the ISAP.

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ISAP reviewed the draft 2018 Biological Opinion and addressed several charge questions developed in collaboration with stakeholders. USFWS responded to ISAP comments.



BIOLOGICAL OPINION
Operation of the Missouri River Mainstem Reservoir System, the Operation and Maintenance of the Bank Stabilization and Navigation Project, the Operation of Kansas River Reservoir System, and the Implementation of the Missouri River Recovery Management Plan

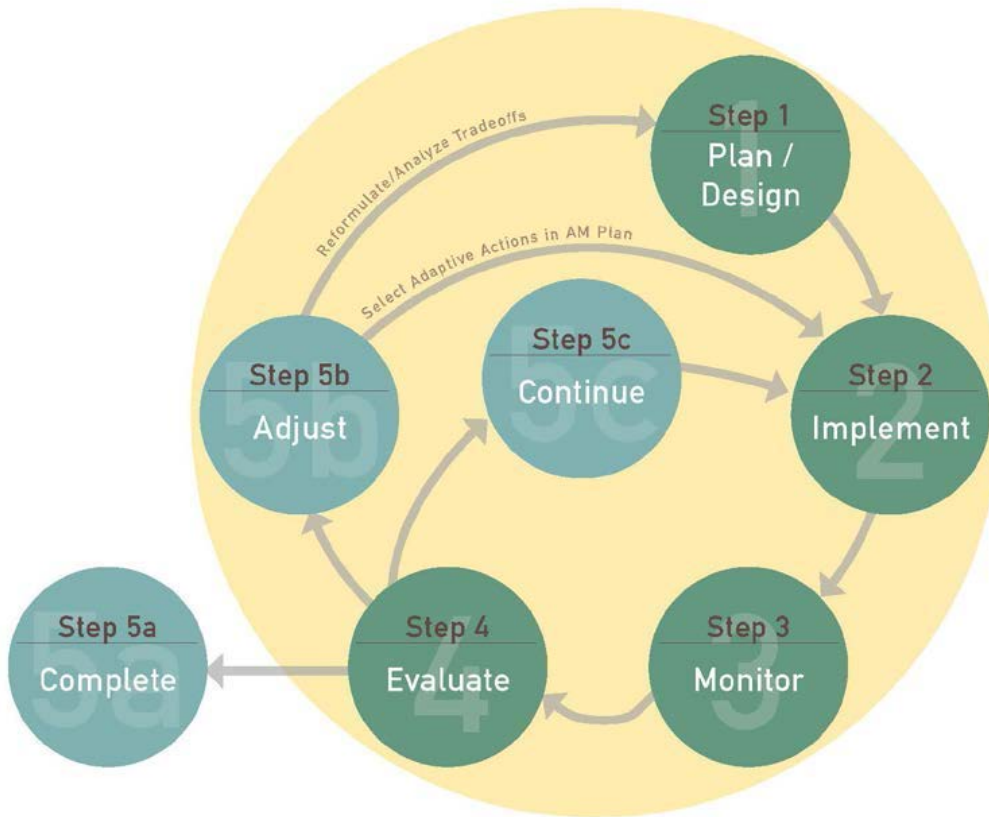
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FISH AND WILDLIFE SERVICE
Mountain Prairie Region
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Assistant Regional Director for Ecological Services _____

Date April 13, 2018

Not only was independent science review utilized in the development of the AM Plan for the MRRP, the annual AM cycle includes independent science review at each step in the cycle.



To date, ISAP reviews have included:

- Development of species objectives by USFWS for the MRRP
- Conceptual ecological model development and use
- Effects Analysis development
- Monitoring plans
- New Information Process
- Development of Science and Adaptive Management Plan
- Draft Biological Opinion



The Independent Social Economic Technical Review Panel (ISETR).

Panel expertise includes:

- International trade, consumer demand, price analysis, commodity markets.
- Water resources policy and governance, science-policy interface, comparative environmental policy
- Economic analysis in the formation of water and related land resource policy, development of evaluation protocols for large-scale ecosystem restoration projects



The ISAP has played a critical role in increasing stakeholder confidence in program direction by:

- Critically reviewing products and responding to stakeholder questions
- Giving candid feedback on strengths and weaknesses of the program
- Sharing past experience with relevance to the MRRP
- Engaging in scientific discussion with agency staff and contractors in a learning environment with stakeholders
- Challenging real and perceived confirmation bias among scientists working on the Missouri River
- Maintaining independence by following established processes



Key lessons learned:

- More frequent interaction with the ISAP is better
- Engaging ISAP early on in development of products is important
- Must provide opportunity for technical and transparent discussion between ISAP and agency technical experts and contractors
- Agencies must follow up with responses to ISAP feedback and ISAP must share thoughts candidly with stakeholders
- Involvement of stakeholders (MRRIC) in these independent reviews is critical



Questions?