Date: 4 April 2018

To: US IECR, MRRIC

From: Independent Science Advisory Panel

Subject: Addendum #2 to ISAP Review of MRRMP Draft BiOp

After the ISAP presented its review of the draft Biological Opinion to MRRIC on the morning of 27 March, the panel received two documents from FWS via the Corps. The documents are described in correspondence as "concept papers" and titled "Incidental Take Statement (ITS) Summary" – one each for the pallid sturgeon and the two bird species. The ITS summary identifies Incidental Take that may be anticipated as a result of the implementation of the proposed action. Exceeding the take limit would be cause for reinitiating consultation.

The ISAP had noted in its presentation that the draft BiOp was incomplete, pointing to the absence of an ITS, which is required in a completed BiOp. Although the ITS should be expected to be based on the "best available science," it might fairly be viewed as having less immediate importance to the MRRMP and the adaptive management agenda than other sections of the BiOp. For example, the jeopardy/no jeopardy findings, the RPAs, or the RPMs in the BiOp need to be based on quantitative data and analyses either referenced or documented in the effects analysis for each species and integrated with the MRRMP management agenda.

The ISAP identified some technical issues in the pallid sturgeon ITS summary document that warrant attention by FWS. The two-page document states "In many cases, the biology of a listed species or the nature of the proposed action makes it difficult to detect or monitor take of individual animals." Then "Therefore, the Service is using a surrogate." Followed by "Because take is directly related to removal of individuals from the [pallid sturgeon] population, a survival estimate is an ideal surrogate to evaluate take." The ITS document further prescribed:
- "Use mark/recapture information from PIT tags or other such marks (PSPAP 2.0 data)
- Analyses – annual survival estimates with standard errors
- Prepare for both Upper and Lower Missouri River.
- Utilize a 3-year running average using past PSPAP data to establish the baseline survival estimate."

The Panel recognizes the possibility of obtaining a reliable pallid sturgeon survival estimate for the upper Missouri River. However, it is not possible to do so for pallid sturgeon in the lower river given contemporary knowledge of the fish's distribution and ecology. The upper river supports a "closed" pallid sturgeon population. Individuals captured and marked in the upper river that are not recaptured can be assumed to have died or to have survived but were not subsequently detected. With adequate sampling and analytical tools, an annual survival estimate can be ascertained for the upper-river population. In contrast, the distributional footprint of the pallid sturgeon demographic unit (the closed population) to which the lower Missouri River contributes is not fully understood, but apparently includes some portion of the Mississippi River. Estimating survival rates for pallid sturgeon below Gavins Point Dam requires sampling

beyond the confluence of the Missouri River with the Mississippi River. In the lower Missouri River individuals that are not recaptured may have died, evaded recapture, or might have simply emigrated from the lower river. Limiting sampling to the lower Missouri River would underestimate pallid sturgeon survival and overestimate the impacts of the permitted action (operations of the Missouri's six dams). A pallid sturgeon survival estimate for the lower river is therefore an unreliable surrogate or proxy measure for use in a pallid sturgeon ITS and should not be proposed as such in the ITS summary.

The Service offers, "As this is an ongoing and long term action, should information become available that suggests a better metric or surrogate for approximating take, the Service will take that information into consideration for amending the ITS." Information generated by AM can be expected to help better resolve a fundamentally sound ITS by drawing on new data on pallid sturgeon ecology, allowing the Service to refine an already effective surrogate. However, adaptive management cannot validate an invalid surrogate. As is described above, enough is known about the demographics of pallid sturgeon in the lower river and the effects of those demographics on obtaining accurate survival estimates that that candidate surrogate should not be considered until a sampling scheme can be designed that captures the full population to which lower Missouri river pallid sturgeon contribute.

In the upper Missouri River, abundance and survival are being estimated and are regularly updated for the hatchery-origin pallid sturgeon. Identifying baseline values for purposes of differentiating background environmental sources of stress on pallid sturgeon from the effects of river operations is problematic. Rate estimates require other population measures, with attendant challenges in accuracy and precision, at several points in time. Noting that consideration, initially in the ITS why not simply use abundance or catch per unit effort, or both, as the metric(s) for pallid sturgeon in the upper Missouri River. Abundance or CPUE as ITS metrics enjoy added value in that they correspond with the recovery plan and SAMP objectives. There is clear value in exploring in the ITS surrogates or proxy measures that are consistent with recovery and programmatic species objectives to avoid inserting unnecessary confusion into the MRRP process.

The ITS or ITS "summaries" that may be included in the final BiOp could benefit by acknowledging the five process steps described in Murphy and Weiland (2014, on pages 160-161) that those authors suggest are necessary to validate and justify any surrogate measures in ITSs and other applications in ESA implementation.

https://link.springer.com/article/10.1007/s13412-014-0167-y

Murphy, D.D. and P.S. Weiland. 2014. The use of surrogates in implementation of the federal Endangered Species Act – proposed fixes to a proposed rule. Journal of Environmental Studies and Sciences 4:156=162.