U.S. Fish and Wildlife Service Review of Big Question 9 Relating to Pallid Sturgeon Governance Committee Meeting – September 2016

The 2014 State of the Platte Report (SotPR) summarized support for two thumbs up for Big Question 9 (BQ9) which asks: *Do Program flow management actions in the central Platte River avoid adverse impacts to pallid sturgeon in the lower Platte River?* The Executive Directors Office has provided rationale for this decision. The NEFO does not support two thumbs up at this time for BQ 9 because of lingering uncertainties. The Service believes a Program workshop/symposium involving experts knowledgeable about pallid sturgeon biology is essential step toward addressing these uncertainties. The following questions serve as draft discussion topics for the workshop.

<u>Service Questions for the Pallid Sturgeon Workshop</u>

1. What is pallid sturgeon use of the Platte River?
    a. How much of the Platte River is used by the species (range)?
    b. What pallid sturgeon life stages are present on the Platte River?
    c. How does pallid sturgeon use of the Platte River vary seasonally?

2. What the relationship between the species use and flow?
    a. Does flow affect the number of pallid sturgeon present in the Platte River?
    b. Does flow affect how much of the Platte River is used by the species?
    c. Does flow affect the ability of individuals to grow, survive, and/or reproduce?

3. Assuming perfect detection, to what extent does Program water management affect flow?
    a. To what extent is Program water detectable in the Platte River using existing monitoring methods?

4. What is an adverse impact for pallid sturgeon?
    a. Does Program water management adversely impact the pallid sturgeon?

Supplemental Information

Background Information

The SotPR describes impacts to flows and resultant changes to habitat:

> *Given the influence of the Loup and Elkhorn Rivers on lower Platte flows, water management activities in the lower Platte, flow attenuation, and their size and timing, the study concluded Program water management activities would not have a statistically significant impact on lower Platte flows or on the type or availability of pallid sturgeon habitat (as defined only by the study's habitat classifications).*

In BQ9, changes to flow and habitat are used as surrogates for adverse impacts to pallid sturgeon, but BQ9 does not specifically define what constitutes a pallid sturgeon impact. To adequately answer BQ 9, the Service suggests clear description of a criterion (or criteria) that represent an "adverse impact" to the pallid, and then describe how Program's flow management actions effects on hydrology are below levels of an adverse impact.

When defining adverse impact, the Program must consider stage change study peer review comments where major concerns from three out of five peer reviewers justified an "accept with revisions" designation from these reviewers. The Program should also consider pallid sturgeon information published since the stage change study to ensure that BQ9 represent a collective view of the best available science.

Difference between Detection and Impact:

Because the PRRIP flows cannot be detected using current gaging methods, this does not imply that PRRIP flows are biologically insignificant as well. Service provides the following contingency table to illustrate this difference. In summary, the rationale that flows cannot be detected using current gaging methods should not be used to support a thumbs up/down; rather, the BQ9 conclusion should be solely based on species impacts.

	Species Impact	
Flow Detection	Detect Flow, Impact	Detect Flow, Not Impact
	Not Detect Flow, Impact	Not Detect Flow, Not Impact

Type or Availability of Pallid Sturgeon Habitat:

While the SotPR characterize the percentage change in pallid sturgeon habitat as not statistically significant, the Service provides the following alternate perspective on the percent change in habitat. As described in the Stage Change Study, typical Program reductions to lower Platte River hydrology (i.e., from 7,000 to 6,100 cfs) would decrease pallid sturgeon "Run" habitat by 3 percent. The maximum anticipated reduction to lower Platte River hydrology (i.e., from 5,680 to 4,200 cfs) would decrease habitat by 9 percent. Assuming that lower Platte River channels average 1,760 feet (0.33-mile) in wetted width (a reasonable underestimate), the total area of habitat impacted in the lower Platte River range from: a) 192 to 640 total acres from the Elkhorn River confluence to the Plattsmouth, or b) 640 to 1,984 acres from the Loup River confluence to the Plattsmouth. As noted in these examples, small reductions in percent habitat could represent large areas when considering the extent of the lower Platte River. To reiterate earlier Service comments, the above example describes a potential adverse impact recognizing substantial input is needed from species experts prior to incorporating this, or other plausible examples of species impacts, into BQ9.

Additional Inconsistencies:

Inconsistency 1:
BQ9 states the following:

> *However, given that short-term connectivity could be problematic under certain, but infrequent hydrological conditions, and assuming the biological significance of habitat connectivity for pallid sturgeon above 4,000 cfs, the study tool could be used by the Program to implement proactive measures (e.g. altering excess-to-target-flow diversion timing or duration) to prevent potential negative impacts on habitat connectivity.*

This comment identifies a potential species impact which is inconsistent with a "thumbs up" for this question.

Inconsistency 2:
The following conclusion in BQ9 is not in line with peer reviewer conclusions for the stage change study:

> *The general conclusion of the stage change study is that Program water management will not result in measurable changes on flow in the lower Platte River and thus little change to the amount of habitat available to pallid sturgeon.*

The following question was provided by the PRRIP to the peer reviewers of the stage change study:

Is the Stage Change Study sufficient to determine if First Increment Program water activities can be detected (statistically significant beyond the error of the gauging equipment) from base flow conditions?

Three peer reviewers answered "yes" in that Program flow can be detected (Guy, Helsel, and Weber). One of the five peer reviewers stated that Program activities cannot be detected (Wilson). One peer reviewer answered "no" because a better evaluation of gaging errors is needed (Gaeuman).

Supporting Equations:

Equation 1 $\Delta A = (w * l_e) * \Delta H_{min}$
$\Delta A = (0.33 * 32.8) * 0.03$
$\Delta A = 0.3$ mi^2 or 192 acres

Equation 2 $\Delta A = (w * l_l) * \Delta H_{min}$
$\Delta A = (0.33 * 103.5) * 0.03$
$\Delta A = 1.0$ mi^2 or 640 acres

Equation 3 $\Delta A = (w * l_e) * \Delta H_{max}$
$\Delta A = (0.33 * 32.8) * 0.09$
$\Delta A = 1.0$ mi^2 or 640 acres

Equation 4 $\Delta A = (w * l_l) * \Delta H_{max}$
$\Delta A = (0.33 * 103.5) * 0.09$
$\Delta A = 3.1$ mi^2 or 1,984 acres

ΔA = change in habitat area (mi^2)
w = width (mi)
l_e = length of lower Platte downstream of Elkhorn River confluence (mi)
l_l = length of lower Platte downstream of Loup River confluence (mi)
ΔH_{min} = minimum change in habitat (fractional percent)
ΔH_{max} = maximum change in habitat (fractional percent)