

**To: SAM work group and MRRIC**

**FROM: Independent Science Advisory Panel (ISAP)**

**RE: A preliminary response to draft “species objectives” for pallid sturgeon, least tern, and piping plover provided by FWS, dated 3 April 2013**

**Date: 16 May 2013**

The ISAP looks forward to engaging with the SAM work group and resource agencies in the effort to develop Missouri River Recovery Program objectives for the three listed species. We understand that some time is allocated at the meeting in Rapid City next week for discussion. We note that setting species objectives is an essential element in the step-down process that supports adaptive management. Importantly, data and analyses that have been generated from research and monitoring by the MRRP, along with information from other studies of the three species, can be used to develop initial estimates of species objectives.

We suggest that while some guidance can be drawn from the standing recovery plans for the species for use in setting objectives for the MRRP, the geographically targeted species objectives in those plans do not provide appropriate programmatic targets for the system-wide recovery effort now being undertaken. In the cases of least terns and piping plovers, the objectives from the recovery plans

1) were based on professional opinion and were not substantiated by systematic quantitative analyses necessary to estimate the size of each demographic (reproducing) sub-population required to ensure sustainability of metapopulations<sup>1</sup> of the respective species;

2) were developed without reference to the net impacts of Missouri River flows and their formative effects on habitat availability, the system’s project operations, and potential impacts of management (restoration) activities on the two species both in the MRRP planning area and the larger geographic area occupied by the species; and

3) are stated as “deterministic goals” that must be met every year for 15 consecutive years – a program performance objective that is highly unlikely to be met.

To the latter point, river hydrology under current operating conditions results in episodic high-flow periods, with creation of sandbars and other essential habitat (depending on the species) in roughly decadal events, followed by slow degradation of habitat availability between major events. Hence, the amount of available habitat varies significantly through time due to hydrologic processes and current project

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<sup>1</sup> Species with a metapopulations structure have multiple local populations (demographic units) separated geographically but that interact; the overall population often depends on movement between the different local populations – a population of populations.

operations. How would objectives, specified in terms of a fixed number of adults or a rate of population increase (i.e.,  $\lambda \geq 1$ ), be interpreted, given the dynamic nature of demographic responses to Missouri River conditions by the two bird species? Would it be the maximum, minimum, or average number of adults over the long-term, realized as habitat availability varies inter-annually due to river processes and restoration activities? For that matter, how should  $\lambda$  estimates be interpreted in an objectives-setting context? Especially considering that  $\lambda$  can be  $< 1$  in some years during periods when longer-term population growth is occurring. Analyzing the Missouri River “subpopulations” of the two birds both in the context of regional, species-level persistence dynamics and in the context of regional and local river-system dynamics is necessary in setting species objectives and identifying the management actions required to support and sustain the two species on the river over the long term.

Among the many recovery plans on file, few consider such real needs of listed species. But, absent reliable guidance from the plans for the Missouri River’s three listed species, realistic and feasible species objectives nonetheless can be identified for the MRRP. We look forward to discussion next week and beyond regarding how species objectives can be 1) informed by the emerging conceptual models, 2) quantitatively resolved using available information, 3) framed in metrics suitable to the purposes and obligations of the MRRP (for example, numbers of individuals of the listed species, the extent and quality of available habitat and in what distribution, or some other not-yet-considered proxy measure of ecological condition), and 4) supportive of the real conservation constraints and opportunities afforded the MRRP, including how, for example, hatchery-generated pallid sturgeon can serve to advance program objectives that have an ultimate goal of populations that are supported by natural recruitment.

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<sup>2</sup> Lambda is a number describing population growth over a discrete time period. If  $\lambda > 1$ , the population is growing,  $\lambda < 1$  declining.