FWS Recommendations for PRRIP FSM Implementation

24 September 2013

To aid in discussion about and implementation of the Platte River Recovery Implementation Program (PRRIP or Program) Flow Sediment Mechanical (FSM) Strategy and ultimately any future management of flow releases, the U.S. Fish and Wildlife Service (FWS or Service) offers the following recommendations for consideration. The FWS position on FSM implementation is included first followed by technical documentation below.

USFWS Position

The Service believes it is not feasible to address the ability of short-duration high flows (5,000-8,000 cfs) to create and maintain habitat for the target species under existing conditions at the current time. Effort during the remainder of the first increment should instead be focused on the other components of the FSM strategy including (1) increasing channel capacity for flow events (e.g., resolving the North Platte chokepoint); (2) implementing sediment augmentation to reduce the sediment deficit; and (3) using mechanical channel manipulation to widen and clear the channel. Once short duration high flow events can be implemented, it will be possible to analyze and evaluate flow management strategies relative to FSM and increasing the 1.5 year return flow (Q1.5).

Discussion and Technical Documentation

Background - The FSM strategy as outlined within the Adaptive Management Plan (AMP) was developed as an initial management strategy to create and restore habitat conditions on the Platte River for the target species. Management actions described under FSM were intended to offset stressors to riverine processes that have impacted species habitats. Affected riverine processes include alterations to streamflow, sediment supply, and sediment transport in addition to changes in vegetation. The width of the active channel has been reduced as have sandbar sizes and heights. Consequently, habitat quantity and quality for target species has been negatively impacted as well.

The FSM strategy is based on the theory that increasing the Q1.5 in combination with mechanical actions and sediment augmentation would increase sand bar heights/size, increase un-vegetated channel widths, and promote braiding conditions. As the Program was implemented, it was anticipated that key management actions would be applied that would create a change in conditions on the Platte River – these management actions could fall into one of three categories: (1) flow-based changes (releasing flows of varying magnitudes between 5,000-8,000 cubic feet per second [cfs]); (2) changes as a result of sediment augmentation; or (3) changes from mechanical channel manipulation (vegetation clearing, channel widening). The degree of change would be dependent upon multiple variables and the interaction of those variables.

To date, the PRRIP has implemented portions of the FSM Strategy including mechanical manipulation of the channel, sediment augmentation via implementation of a pilot study

(intending to eventually begin full-scale augmentation capable of reducing the sediment deficit), and implementation of two flow events of lower magnitude (generally less than 4,000 cfs).

FWS View of Existing Management Related to FSM

Flow - Flow management (by the PRRIP or the FWS acting as the EA Manager) is currently so limited and constrained that testing the suite of management actions outlined within the AMP is not realistic or achievable. Fotherby (2008) described that the post-Kingsley dam Q1.5 ranged from approximately 3,500 to 6,000 cfs. The PRRIP is currently unable to increase the existing Q1.5. A flow release in 2009 achieved magnitudes ranging from 3,360 to 3,600 cfs while a release in 2013 ranged from 3,690 to 4,070 cfs. Consequently, there is no way to evaluate short duration high flow events and the associated effects given that the PRRIP is unable to release flows within the target range (5,000-8,000 cfs).

More recently, naturally high peak flow events have also occurred on the Platte River (2008, 2010 and 2011) and have altered ecological conditions to varying degrees based on the magnitude and duration of the peaks and the existing conditions when they occurred. A substantial reduction in vegetation occurred and was visibly noticeable after 2011 high flows. Low flows and drought have also impacted the river since the start of the first increment. A substantial increase in vegetation has occurred as a result of these low flow years. Though natural high peak flows provide valuable lessons learned about how flows of different magnitudes affect the river, they are highly unpredictable and cannot be used as a proxy for the effectiveness of short-duration high flows. It is these flows that work in concert with sediment augmentation and mechanical manipulation to restore and maintain habitat for target species. In addition, the short-duration high flows, by augmenting the flow during lower flow years, will over time increase the magnitude of the average annual peak flow. Finally, the peak flows seen during the first six years of the PRRIP are representative of what was observed in the historic hydrograph and we would not expect habitat (quality and quantity) to drastically change without manipulation of flow beyond that observed historically.

Sediment - Sediment augmentation is in its infancy and the Service will continue to support augmentation, as the goal is to fully offset the annual sediment deficit. We believe full-scale sediment augmentation should ultimately be implemented because it is beneficial and serves to help offset anthropogenic effects on the Platte River.

Mechanical - As per the AMP, mechanical channel manipulation can take many forms on the Platte River. Potential management actions include but are not limited to channel widening, vegetation clearing, and until recently, flow consolidation. The Technical Advisory Committee (TAC) reached general consensus that flow consolidation is neither technically feasible nor agreeable as a realistic management action intended to improve existing conditions on the Platte River. The FWS supports abandoning the action and believes it is reasonable considering the inability to implement it at a large-scale. The Service believes the PRRIP should continue testing other mechanical techniques and evaluating their success relative to improving baseline conditions on the Platte River. Implementation of these other types of mechanical manipulation is needed in order to continually maintain target habitat conditions and avoid further degradation. The Service supports implementation of these other types of mechanical manipulation but there

is also a need to evaluate these methods and determine their efficacy. For example, the AMP outlines actions related to channel widening/clearing. It includes a goal of increasing the acreage of channel area over of 750 feet wide by 30 percent over the 1998 baseline. We support existing management actions that have aided in achieving this goal, however, we are presently unaware of any analyses conducted to determine if this metric has been met or how close the PRRIP is to meeting this metric.

Recommendations for FSM Implementation - The current inability to implement short-duration high flow events limit the Program's capacity to reasonably address the ability of short-duration high flow to create and maintain habitat for the target species. Instead, we recommend focusing on implementing projects (e.g., resolving issues at the North Platte chokepoint) that would allow flow releases of 5,000 cfs initially, and 8,000 cfs ultimately. Releases of approximately 6,000 cfs may be possible once the J2 Regulating Reservoir is completed and an additional 2,000 cfs can be released into the river[1]. Once the ability to release and manage flows of 5,000 cfs is attained, it is possible to analyze and evaluate flow management strategies (relative to FSM and increasing the Q1.5). The ultimate goal is a flow release of approximately 8,000 cfs with the intent of increasing the Q1.5. The emphasis on higher magnitude peak flows becomes important because of the limited ability to consolidate anabranched flow.

The Service supports and recommends continuing to implement sediment and mechanical actions in absence of pulse flows intended to increase the Q1.5. We also encourage the PRRIP to investigate if habitat indices such as bar height, bar size, and channel width could be affected by differing applications of vegetation management in conjunction with differing rates and composition of augmented sediment. We also support continuing to monitor and learn from natural flows. Additionally, in the absence of the ability to release flows of 5,000-8,000 cfs, we support evaluating the success of other flow releases of varying magnitude, duration and timing but caution that conclusions related to a simple success or failure should be avoided. Conversely, the intent of these flow events should be to learn what changes or effects these varying flows of different magnitude, duration, and timing have on the Platte River in the near term and over longer time periods.

[1] A SDMF event on the Platte River (as implemented in April 2013) releases ~3,500-4,000 cfs; the addition of the J2 Regulating Reservoir would add an additional 2,000 cfs, bringing the total to ~6,000 cfs for a short duration high flow event.