

DRAFT
INFORMATION PAPER

SUBJECT: Channel Conveyance, Missouri River Flood Task Force, River Management Working Group

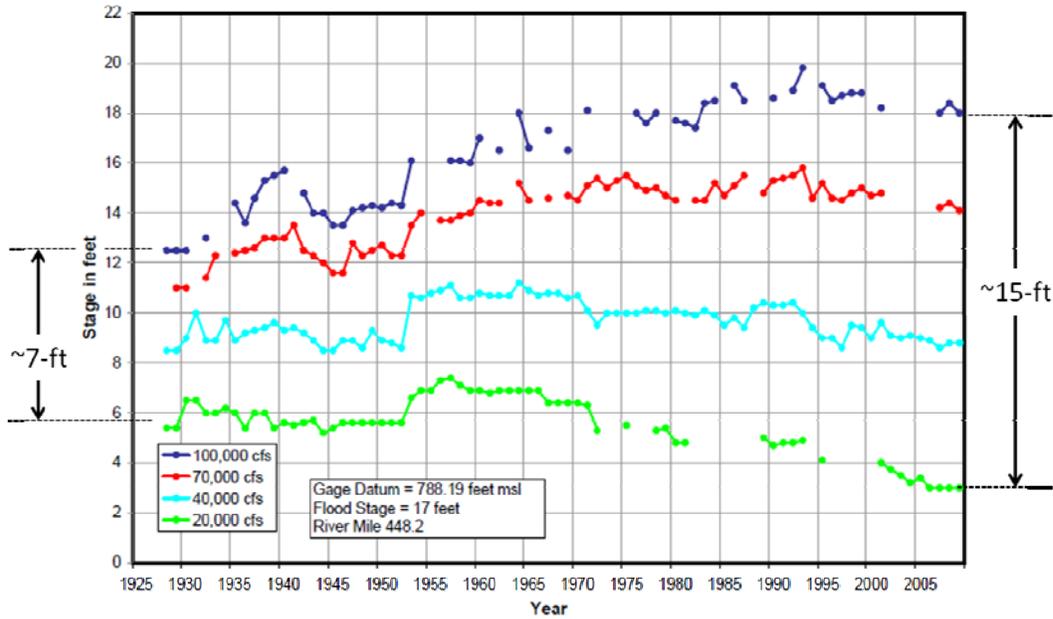
1. **PURPOSE:** To summarize ideas developed by the River Management Working Group concerning channel conveyance in the Missouri River.

2. **BACKGROUND:** The Missouri River experienced exceptionally long duration flooding during the summer of 2011. High water levels overtopped levees, caused levee failures through seepage, degraded the channel, and damaged the navigation system. Ideally, if the Missouri River could pass larger amounts of flow at the same or lower water surface elevations, less damage to infrastructure would occur. The Corps of Engineers has been charged by Congress to manage the Missouri River for eight authorized purposes including navigation. The navigation purpose requires the minimum release of water from reservoirs to maintain a nine foot deep navigation channel and requires the placement of structures in the river to retain a self-scouring channel. The River Management Working Group was tasked with coming up with ideas to increase river conveyance.

3. **DISCUSSION:**
 - a. What is the impact of the BSNP on flooding? The BSNP stabilizes channel banks and the main river through the use of extensive rock revetments and dikes. Without these revetments and dikes, the river would change course during high flows. It is currently unknown how removal of the BSNP would impact flooding between existing levees.

 - b. Is there a way to increase the conveyance capacity of the river by repositioning or removing jetties? The Corps has not done any analysis to determine the specific cause and effect relationships for increased flood stages caused by jetties. To date neither the Corps, nor anyone else has completed any credible studies that can point to any one thing that would cause increases in flood stages on the Missouri River.

- c. Where are the existing constrictions in the system? We know flow constrictions are created by levees, highway and railway embankments, bridges, and natural bluffs. The location of these constrictions would have to be identified in a hydraulic study of the river.
- d. Can flood storage be designed into existing levee cells and better coordinated through gate operations or breaching allowing water in and out of protected areas? When levees breach, there is an immediate reduction in water surface as water fills the levee cell. Depending on the total volume of the flood, this temporary storage can be significant. The flood volume of 2011 was so large and the peak occurred for such a long time that levee breaches only temporarily reduced water surfaces. However, flood storage in levee cells could be significant in reducing water surfaces in a short term flood with high peak flows.
- e. How can levees be set back from the river to increase conveyance? Original Pick-Sloan plan called for a floodway width between levees that would vary from 3,000 feet at Sioux City to 5,000 feet in the lower river. Recommendation for a minimum floodway width between levees along the Missouri River was recommended in a August 1946 Definite Project Report on Missouri River Levees as follows
- Sioux City to mouth of Kansas River 3,000 ft
 - Mouth of Kansas River to mouth of Grand River 4,000 ft
 - Mouth of Grand River to mouth of Osage River 4,500 ft
 - Below mouth of Osage River 5,000 ft
- The Missouri River Recovery Program, NRCS, Nature Conservancy, and others can establish this 3,000 ft to 5,000 ft floodway by purchase of appropriate private properties from willing sellers.
- f. What is the impact of degradation on channel conveyance? Bed degradation increases flow conveyance for low flows but decreases flow conveyance for high flows. As the channel becomes incised stages for low flows are lower. However, the increasingly undisturbed overbanks grow heavy vegetation which slows larger flows and increases stages. The following graph shows this phenomenon at River Mile 448.2.



4. SUMMARY:

The River Management Working Group has raised significant questions and issues about increasing Missouri River flow conveyance. Some of the questions cannot be answered without further study. The public needs to take an increased role in understanding how the Missouri River is being managed and make their concerns known to appropriate public agencies. The Corps of Engineers has been charged by Congress to manage the river for eight authorized purposes including navigation. The navigation purpose requires the minimum release of water from reservoirs to maintain a nine foot deep navigation channel and requires the placement of structures in the river to retain a self-scouring channel.