Dams and associated streamflow regulation have greatly limited cottonwood forest regeneration along the Missouri River (Johnson et al. 2012).

Delta formations along reservoirs, including deltas where tributaries enter into reservoirs, are one of the few places along the Missouri River where there is evidence of cottonwood regeneration (Johnson 2002).

The White River delta, formed at the confluence of the White River and Fort Randall Reservoir on the Missouri River in South Dakota, is an example of a delta habitat that supports cottonwood forest regeneration.

The White River delta has undergone sedimentation and associated geomorphic change since closure of Fort Randall Dam in 1956, creating favorable environmental conditions for cottonwood establishment.

The purpose of this study was to measure post-dam changes in channel and floodplain morphology along the lower White River and at the White River-Missouri River confluence to better understand how these changes influence the establishment and survival of cottonwood forests.

**INTRODUCTION**

- A time-series (1953–2011) of riverine cross-sections from the lowermost 31 km of the White River and from the White River-Missouri River confluence were used to investigate changes in channel and floodplain morphology in the post-dam era.

**METHODS**

**Study site: The White River delta**

**RESULTS**

Rates of sedimentation history at six stream cross-sections

**ACKNOWLEDGMENTS**

Funding was provided by the US Army Corps of Engineers, South Dakota Game, Fish & Parks, South Dakota State University, and the University of South Dakota.

**REFERENCES**


**CONCLUSIONS**

- Streambed elevation increased from 0.6 to 12 m in the post-dam era, with the largest increases occurring at the most downstream cross-sections.
- The average gradient of the lower White River increased from 0.69 m/km in 1954 to 0.25 m/km in 2011.
- Rates of channel aggradation were highest in the decade that followed dam closure, and have declined since that time.

- Post-dam changes to the physical environment of the lower White River are favorable for recruitment of cottonwood forest vegetation, a habitat type that is in decline elsewhere along the Missouri River.
- Delta forests are subject to periodic reservoir inundation and may die back during high water years.
- Knowledge of the changing morphology and elevation of the White River delta can reveal how reservoir pools could be managed to favor the establishment and survival of delta forests over the long-term.