

Feasibility Study of Removing The Grand Rapids-Providence Dams, Maumee River (NW Ohio) Based on HEC-RAS Models

Zach Mueller and James E. Evans
Bowling Green State University

The Providence and Grand Rapids dams, located on the Maumee River at Grand Rapids, Ohio are low-head dams built in 1840 as rock-crib dams that were subsequently bolstered with concrete in 1907. This study investigated the impacts to the flood regime in the area associated with the removal of the two dams by comparing Hydrologic Engineering Center River Analysis System models of pre- and post-dam removal scenarios with 10-, 25-, 50-, 100-, 200-, 500-year flooding events. The research also examined the potential release of sediment trapped behind the dams by performing grain-size analysis of sediment collected upstream of the dams.

The models showed no significant change in the flood regime upstream of the dams and no change at all downstream of the dams. The differences in the areas inundated upstream of the dams due to these changes varied from no change to 0.01 mi² for the 10-year and 500-year flooding events respectively.

The potential release of sediment trapped behind the dams was determined to be low due to the low trapping efficiency of the dams determined from observations of essentially no sediment accumulation in the reservoir. Along with the low trapping efficiency of the dams, the majority of the sediment being transported by the Maumee River was determined to be largely mud which is transported as suspended load and carried over the dams.

These results showed no significant changes in the flood regime near Grand Rapids, Ohio and no risk of releasing large quantities of sediment downstream after dam removal.