

ECOLOGICAL IMPACTS OF REMOVAL OF THE HISTORICAL ADVOCATE DAM IN HATFIELD, MASSACHUSETTS

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The effects of dam removal to impoundment wetlands were studied using the historical Advocate Dam on the Mill River in Hatfield, Massachusetts. Dam removal is being considered to increase fish passage, increase potential federally endangered dwarf wedgemussel habitat, and to return the river to its natural flow regime. The first objective of this assessment was to analyze the relationship between wetland type and water level inundation. Stage duration curves were used to relate stage patterns and wetland elevations to calculate wetland inundation times. Stage data were collected for May to October of 2005, and an extended period of record of stage was generated by correlating Mill River, Northampton flow with Mill River, Hatfield flow. Wetland elevation data were collected during transect surveys in November of 2005. The second objective was to look at the relationship between vegetation, elevation, and water level fluctuations based on land surface cross sections and dam removal water levels. This analysis related transect survey data and both collected, and generated, stage data. The third objective was to study how wetlands would shift if the water level dropped due to dam removal. A digital elevation model was constructed to quantify that shift. Wetland inundation times suggested that certain wetland types are more tolerant of a range of moisture levels, while others require more consistent conditions. A drop in water level after dam removal would limit the impoundment wetlands to the riparian corridor. Wetland area would decrease by approximately 57%. While this analysis indicates that dam removal would result in a significant decrease in wetland area, and a loss of important habitat, further study is needed to weigh the benefits of increased fish passage, river connectivity, and natural flows against the potential loss in wetland habitat.