

ROADWAY EFFECTS ON THE HYDROLOGIC REGIME OF TEMPORARY
WETLANDS IN THE MISSOURI RIVER FLOODPLAIN IN MISSOURI

Kimberly Horton

Dr. Leigh H. Fredrickson, Thesis Supervisor

ABSTRACT

The effects of roadways on wetland ecosystems are not clearly understood, although alterations of wetland hydrologic regimes have been frequently observed (Nunnery and Richardson 1997). The goal of this research was to assess the effects of roadways on the hydrologic regime of temporary wetland basins within the agricultural landscape of the Missouri River floodplain from Hartsburg to Independence, Missouri. This study is part of a larger existing research project designed by the Missouri Department of Conservation to evaluate habitat use by various waterfowl and shorebirds in the Missouri River floodplain (Raedeke et al. 2003). Aerial surveys were conducted for sixteen 1.6 km wide survey transects, bluff-to-bluff and perpendicular to the Missouri River from fall 2000 through fall 2002 to record the extent of surface water for individual wetland basins. A Geographic Information System (GIS) was used to determine the inundation and shape characteristics for selected wetland basins within the transects. Roads and other anthropogenic alterations of wetlands within the study area were inventoried using GIS and Global Positioning System (GPS).

When unaltered basins were compared to basins affected by roads, agricultural ditches and levees, those basins affected by roads were most similar to unaltered basins,

indicating that incidental effects from roads may not be as severe as effects from other anthropogenic alterations. Findings from these analyses indicate that roads, especially state roads, tend to impound water, resulting in basins being inundated for longer periods of time with less fluctuation in the amount of surface water area than unaltered basins and basins affected by local and private roads. This research provides information for agencies tasked with protecting or enhancing wetland systems and can be used to aid in the development of future goals and objectives for conservation or restoration of wetlands. Continued research is required to define roadway impacts on the hydrologic regime of wetlands and explore methods to minimize these impacts.