

**ENV Report 53 – *Water Level Management Opportunities for Ecosystem Restoration of the Upper Mississippi River and Illinois Waterway*** by Kevin J. Landwehr, Charles H. Theiling, Thomas R. Gambucci, David R. Busse, Joan M. Stemler, and Daniel B. Wilcox.

**ABSTRACT**

This study was conducted in support of the Restructured Upper Mississippi River and Illinois Waterway System Navigation Study. The purpose of this report is to provide cost and benefit information for alternative water level management actions being evaluated for inclusion into the Environmental Alternatives of the Restructured Navigation Study. The management actions, considered herein, are designed to provide ecosystem restoration benefits on a pool-wide scale. Therefore the alternative management actions, discussed in this report, focus on changes in the way the dams are operated, as opposed to the isolation and management of individual off-channel areas.

Six alternative water level management actions are identified and discussed in terms of their potential to support identified ecosystem restoration goals and objectives. A prioritization of the identified water level management actions was conducted to identify those combinations of management actions and pools that produce the most benefits for the least cost (i.e., are efficient) and are most likely to be successfully implemented (i.e., are feasible). The prioritization process was not intended to exclude any pool or management action from possible future consideration, but rather to help focus this effort on those combinations of management actions and navigation pools that appeared to be the most efficient and feasible, for development of benefit and cost information.

Where possible, quantitative benefit and cost information for the prioritized water level management actions were developed. The values represent average, expected benefits and costs. Implementation of any of the management actions has the potential to produce varying ecological responses due to annual variations in hydrologic and growing conditions that affect the duration, magnitude, and timing in which the management actions could be implemented. Quantification of benefits in terms of ecological response was often not possible due to an incomplete knowledge of resource populations, other factors affecting the population dynamics, and the relationships between organism responses and physical processes. In these instances, anticipated benefits are qualitatively discussed. The benefit and cost information will be used to aid in the development of Environmental Alternatives for consideration in the Restructured Navigation Study.