



## WATER RESOURCES RESEARCH GRANT PROPOSAL

**Title:** Watershed Level Approach To Siting Wetlands For Hydrologic And Water Quality Functions

**Duration:** September 1997- August 1999

### Federal Funds Requested:

Year 1	Year 2	Total
\$29,850	\$25,606	\$55,456

### Non-Federal Matching Funds:

\$56,033	\$55,021	\$111,054
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### Principal Investigators:

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**Congressional District:** Third

### Statement of Critical Regional or State Water Problems

The midwestern USA is one of the most agriculturally productive regions where intense production has been possible because of the quality and availability of the natural resources and suitable topography (Burkhart et al. 1994.) Modification of the local and regional hydrology has been an essential part of this conversion. Creation of extensive networks of subsurface tile drains, excavation of surface drainage ditches, and channelization of many perennial streams has facilitated the conversion of nearly all of the land to agricultural uses and has provided direct conduits for nonpoint source pollutants to surface waters. The resulting impact on the quality of surface and groundwaters of the region has been profound. A challenge for resource managers in such landscapes is the development and implementation of restoration-based management approaches that build upon traditional pollution control efforts. One promising approach to increase the effectiveness of efforts to protect soil and water quality while also enhancing the physical, chemical, and biological integrity of the terrestrial and aquatic systems is the creation or restoration of landscape buffer zones (National Research Council 1993). This research takes a watershed-scale approach to siting wetlands within

agricultural watersheds and directly addresses the research priority areas of wetlands processes and management, watershed processes and management, and nonpoint source pollution reduction identified by the United States Geological Survey .

### **Statement of Results and Benefits**

From a water resources perspective, farming systems are best viewed as hydrologic units or watersheds, and at this scale, the potential hydrologic and water quality functions of restored and constructed wetlands should be an integral part of management considerations. However, wetland restorations in the region have been motivated primarily by concern over waterfowl habitat loss, and site selection criteria have not adequately considered hydrologic and water quality functions of wetlands. As a result, there are relatively few management tools to guide watershed-scale approaches to wetland restoration and construction. At present most of these decisions are based on intuitive and subjective estimates based on limited field demonstration sites. County, state, and national governmental and non-governmental organizations are requesting better tools for selecting and planning wetland restoration projects, tools which explicitly consider hydrologic and water quality functions. The proposed work will help to provide just such tools by refining a watershed-scale approach to wetland restoration and construction which is currently being developed by the Wetlands Research Group at Iowa State University. This work will be done in collaboration with the Agroecology Issue Team of the Leopold Center for Sustainable Agriculture and will take advantage of the ongoing watershed management and water quality monitoring project within the Bear Creek watershed in North Central, IA.