

**Forage Improvements and Riparian Buffers for Water  
Quality and Sustainability: A Small Farm Management Plan**

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### **Abstract**

Black Hawk Creek was included in the Iowa Department of Natural Resources (DNR) 303(d) list of impaired waters in 1998 due to non-point sources of fecal coliform bacteria. Water quality degradation in the stream network is also impacted by excess nutrients in surface runoff from cropped fields and pastures, sedimentation erosion of streambanks from the high volume of water flow following storm events, and the pulse of enriched groundwater drained into the streams from the subsurface tile network. Rotational grazing will replace the current continuous grazing management system. Implementation includes controlling both sides of Black Hawk Creek in the permanent pastures with electric fence, installing reinforced controlled stream crossing sites, establishing a permanent clean water distribution system and enhancing the Kentucky bluegrass dominated pastures with three cool season naturalized grass and three legume species adapted to the north central Iowa loess landscape. Multi-species riparian buffers based on the Leopold Center for Sustainable Agriculture's model and other models based on simulating the functionality of presettlement ecosystem savannah grassland will be created between monocultures of corn and soybean fields and the stream network. Follow on studies will monitor the effectiveness of a managed forage sward, riparian buffers, and natural healing of streambanks to mitigate excess nutrient movement into the streams.

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