
AWRA 2011 ANNUAL WATER RESOURCES CONFERENCE
Albuquerque, New Mexico

November 7-10, 2011

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**SUSTAINABLE GROUND WATER SUPPLY SOURCE PROTECTION
THROUGH HABITAT RESTORATION AT REMSEN, IOWA**

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ABSTRACT: The community of Remsen relies on a number of shallow alluvium municipal wells as a part of its water supply. These wells had shown significant nitrate contamination since 2005. On the basis of the increasing nitrate concentration trend, Remsen will most likely need to install expensive denitrification treatment to maintain their water supply in the near future. With assistance from the Iowa Department of Natural Resources (DNR) Contaminated Sites Section, potential areas of concerns were identified and investigated using ground water flow models and ground water sampling in 2008 and 2009. A specific plot of land where over-application of manure had been practiced was identified as a major source of nitrate to the shallow alluvium wells. Through a partnership effort with the Remsen Source Water Protection Community Planning Team, the Remsen Utilities Board and City Council, Plymouth County U.S. Department of Agriculture (USDA) - Natural Resources Conservation Service, Sioux River Resource Conservation and Development Council, Iowa DNR Source Water Protection Program and Contaminated Sites Section, Iowa DNR Clean Water State Revolving Fund, State Watershed Improvement Review Board, USDA Agricultural Research Service, and Plymouth County Pheasants Forever Chapter, a combination of loan and grant were used to purchase land of the well field where Pheasants Forever prepared seedbed and plant most of the acquired areas for restoration to prairie in the Spring of 2009. Additional ground water modeling and ground water sampling have shown that the prairie habitat restoration has gradually and continuously lowering the nitrate concentration in the shallow aquifer. Source water protection through land use management and habitat restoration has been demonstrated to be an effective and sustainable approach to improve the quality of water supply sources.

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