

## Squaw Creek AgNPS SALT Project Final Report

### Submitted by Holt County Soil and Water Conservation District

#### Location and Watershed Characteristics

The Squaw Creek watershed area is approximately 40,130 acres and is located in Holt County in northwest Missouri. The watershed outlet is 1.5 miles north of Mound City on State Highway 59, south through the Squaw Creek National Wildlife Refuge, then six miles south to the Missouri River. Approximately 70 percent of the watershed is row crop agriculture, primarily corn and soybean. Because of heavy cropping there are high applications of nitrogen fertilizers used on corn crops, as well as corn and soybean herbicide and pesticide application. The overall goal of the five-year Squaw Creek Agricultural Nonpoint Source Special Area Land Treatment (AgNPS SALT) Project was to reduce siltation, sedimentation, and nutrient loads from the watershed onto Squaw Creek National Wildlife Refuge. This 7,415 acre refuge includes approximately 6,700 acres of floodplain that is managed as wetland, grassland and riparian habitats which attract bald eagles, snow geese, and ducks during fall and winter seasons, as well as other species of birds, mammals, reptiles and amphibians.

#### Water Quality Incentives for Landowners

With the implementation of best management practices 81.38 percent of our project goals were met. Cost-share incentives were provided through the AgNPS SALT project funds, regular cost-share funds, and U.S. Fish and Wildlife Service (USFWS). Through the Partners for Fish and Wildlife Program, USFWS authorized Clean Water Action Plan funds for water quality and stream resource improvement projects in the Squaw Creek watershed. The funding provided an additional 20 percent cost-share incentive to landowners for the restoration and construction of certain qualifying grade stabilization structures, thus improving water quality and quantity on private lands and waters entering the Squaw Creek Wildlife Refuge. With special permission from the Soil and Water Districts Commission, we were allowed to use a competitive bid process for the construction of the structures.

The following accomplishments, listed by conservation practices were completed:

Permanent Vegetative Cover Establishment	33.3 acres
Terraces	813.95 acres
Water and Sediment Control Basins (addressing sheet and rill erosion)	215.0 acres
Water and Sediment Control Basins (addressing gully erosion)	135 (no.)
Grade Stabilization Structures	12 (no.) –10 of these structures utilized the USFWS incentive

Windbreaks	1.4 acres
Cropland Protective Cover	303.6 acres
Conservation Tillage	5982.2 acres
Filter Strips	86.5 acres
Pest Management	1594.2 acres
Nutrient Management	4884.7 acres

The pest and nutrient management practices were the most successful. The project's goals were ~~easli~~easily met within two years, and cost-share assistance was used to meet other project goals. AgNPS SALT cost-share incentives for the nutrient and pest management practices were the first to ever be offered in Holt County, and landowners are now able to request assistance for the implementation of these practices through the federal Environmental Quality Incentive Program (EQIP). EQIP funding has only been available to the producers in Holt County the last two years. .

The Squaw Creek AgNPS SALT project successfully ~~address~~addressed project goals, but due to lack of landowner interest (~~\*is this true?\*~~) the number of woodland protection and wetland development practices installed ~~did~~ was less than initially anticipated.

### **Information and Education Activities**

A Precision Ag Field Day was held on July 7, 2004. Demonstrations were conducted on two farms located in the Squaw Creek watershed. University of Missouri Extension and USDA-NRCS personnel provided information about variable rate farming. Tools of precision agriculture, including GPS receivers, yield monitoring and mapping, grid soil sampling and variable-rate fertilizer application, were demonstrated by service providers.

Landowners received updates of the AgNPS SALT practices and progress through the Holt County Service Center newsletter, Squaw Creek Watershed Newsletter, one-on-one contacts, and news articles in the local newspaper. Photos of educational activities and AgNPS SALT practices are showcased on Holt County SWCD's Web site.

The Squaw Creek AgNPS SALT project is noted in the 2005 USFWS Squaw Creek National Wildlife Refuge Comprehensive Conservation Plan and Environmental Assessment. The plan notes that the Squaw Creek AgNPS SALT project is a watershed improvement strategy to reduce sedimentation from soil erosion from private lands and improve water quality on Squaw Creek National Wildlife Refuge by using conservation practices, fostering improved soil and water uses. The comprehensive plan states that in order for the refuge's wetlands to survive in to the future, work has to be accomplished in the upstream watershed to reduce flood events and to improve water quality.

The U.S. Geological Survey recognized the Squaw Creek AgNPS SALT Project in Water-Resources Investigations Report 03-4211 titled Topography and Sedimentation Characteristics of the Squaw Creek National Wildlife Refuge, Holt County, Missouri,

1937-2002. It mentions the five-year AgNPS SALT project as a pollution management project to provide assistance to landowners in enhancing Squaw Creek water quality, including reducing sediment and nutrient transport.

### **Measures of Progress**

The U.S. Geological Survey operated a stream flow gage and automatic sampler at the outlets of Squaw and Davis Creeks, where the streams leave the loess hills and enter the Missouri River floodplain. Storm loads and yields of suspended sediment from the two basins were compared in a paired watershed study approach. The paired watershed approach detected the temporal trends by comparing storm loads in the control (Davis Creek) and treatment (Squaw Creek) basins to identify treatment effects.

Data collected in Fiscal Year 2001 and Fiscal Year 2002 was used to characterize the severity of existing water quality conditions before implementation of best management practices in the watershed. The U.S. Geological Survey Water-Resources Investigations Report 03-4211 states that “measures taken in the Refuge to limit flooding and control the timing of inflows, along with erosion-control measures in the Squaw and Davis Creek Basins, seem to have resulted in a substantial reduction in the average rate of sediment deposition for 1964 to 2002, compared to 1937 to 1964.” Data collected in 2003, 2004, and 2005 will also be reviewed to determine if the treatments have been effective. In lieu of an interpretive report, U.S. Geological Survey will provide a summary of the sediment data in the form of a letter.

### **Summary**

Holt County SWCD feels that this project was a success. The district provided new and innovative conservation treatments to address nonpoint source pollution. Most importantly, the project has shown that when agencies combine resources very effective conservation measures can be developed and implemented.