

Executive Summary

The Squaw Creek Management Plan was developed through a year-long series of meetings of the Watershed Management Authority Board and representatives of Emmons & Olivier Resources and the Prairie Rivers of Iowa RC&D. The planning process began with a series of meetings to describe the existing conditions within the watershed and the challenges facing its water resources. The Board of Managers took this information and developed a set of goals for the future of the watershed. Based on these goals, a set of strategies/approaches was developed.

Watershed Assessment

The watershed assessment was built around three main areas; a general characterization of the watershed, a summary of the existing health of the streams within the watershed and an exploration of the sources of pollutants generated in the watershed.

Watershed Characterization (Section 2)

The watershed characterization section includes a description of the watershed's hydrology. The subwatersheds and stream network is defined and mapped. Watershed factors influencing health of streams, including land use/land cover, soils, topography, groundwater, climate are also summarized. The general finding of the watershed characterization is that the agricultural land cover that dominates the watershed, along with climatic elements play the largest role in defining the character of Squaw Creek and its tributaries.

Stream Health (Section 3)

The examination of stream health included in the plan is built around a summary of water quality measurements and an assessment of stream stability. Water quality monitoring data from the past decade was reviewed and summarized by the common parameters/pollutants. Stream stability was evaluated through a comparison of two recently conducted stream assessment projects in the watershed. The past water quality monitoring data shows that Squaw Creek and its tributaries have very high levels of nutrients, sediment and fecal bacteria, all of which are of concern for stream health. The stream assessment indicates that the streams are exhibiting symptoms of being within a hydrologically altered watershed; there are areas of extreme instability throughout the watershed.

Pollutant Source Assessment (Section 4)

After determining that there were nutrient and fecal bacteria concerns in Squaw Creek the next step was to assess the likely sources and magnitude of contribution occurring in the watershed. A water quality model was constructed for the watershed using land cover, crop rotation, land use, topography, soils and climatic data. The model was used to determine which areas in the watershed produce a disproportionate rate of nutrients. These areas, referred to as hot-spots in the plan, are used to prioritize future management. An assessment of potential sources of fecal bacteria was also conducted for the watershed utilizing available data on animal feeding operations, grazing animals, failing septic systems, pets and wildlife. Of the sources assessed, manure from confined animal operations is the most abundant in the watershed.

Goals and Objectives (Section 5)

Following a complete review of the watershed assessment, the Board of Managers developed goals and objectives for future conditions in the watershed. The goals were developed through a series of meetings and considerable discussion. Measurable objectives were developed for each of the goals. The goals of the watershed management plan are as follows;

- Increase people's awareness and understanding of the individual connections and efforts within the watershed
- Improve water quality in the watershed
- Reduce the effects associated with altered hydrology (heavy flows, diminished base flow) within the watershed
- Increase the variety of habitat for animal and plant life in the watershed
- Create outstanding recreational opportunities in the watershed
- Work cooperatively to identify stakeholders and resources and facilitate partnerships to implement the watershed plan

Implementation Strategies (Section 6)

A game plan to meet the objectives defined for the future of the watershed was developed based on the six main goals described above. While approaches were detailed for each of the goals, the primary focus of the implementation strategies section is on the approach for education/outreach and water quality improvement goals, and more specifically the water quality improvement objectives dealing with nutrient reduction. A detailed work plan was developed for the education/outreach component of the plan that stresses the importance of establishing a watershed coordinator to facilitate implementation of the plan. The nutrient reduction strategy component of the implementation section consisted of a robust BMP analysis including; a review of the pollutant hot-spots, BMP performance data, cost-effectiveness and terrain suitability.

Monitoring Plan (Section 7)

A plan for on-going monitoring of Squaw Creek has been developed that focuses on the downstream USGS gage site as an anchor point to evaluate trends in water quality.

Funding Source (Section 8)

Funding alternatives available for watershed management activities are provided.

1. Introduction

The mission of the Squaw Creek Watershed Management Authority is to engage, educate and encourage all citizens to improve the health, stewardship and resiliency of our watershed resources.

1.1. Watershed Management Authority

In 2010, Iowa lawmakers passed legislation authorizing the creation of Watershed Management Authorities ([Iowa Code Chapter 466b](#)). A Watershed Management Authority (WMA) is a mechanism for cities, counties, Soil and Water Conservation Districts (SWCDs) and stakeholders to cooperatively engage in watershed planning and management. The Squaw Creek Watershed Management Authority was formed in 2012 through execution of a signed agreement between members known as a Chapter 28E Agreement (refer to Appendix 1: Squaw Creek WMA 28E Agreement for full text of document). Generally, the purpose of the Squaw Creek WMA is to:

- Assess and reduce flood risk;
- Assess and improve water quality;
- Monitor federal flood risk planning and activities;
- Educate residents of the watershed regarding flood risks and water quality; and
- Allocate moneys made available to the Authority for purposes of water quality and flood mitigation.

It is important to note that, per Iowa Code, WMAs do NOT have taxing authority or the right to acquire property through eminent domain.

Membership in the Squaw Creek WMA is based on the hydrologic boundary of the Squaw Creek Watershed which is shown in Figure 1-1 and summarized in Table 1-1.

Table 1-1. Membership of the Squaw Creek Watershed Management Authority

Member	Primary Representative	Additional Representatives Involved in Plan Process
City of Ames	Ann Campbell	Bob Kindred
City of Stanhope	Suzie Moore	
City of Stratford	Travis Sonksen	
City of Gilbert	Jonathan C. Popp	Frank Rydl, Sonia Arellano
Story County	Paul Toot	
Story County SWCD	Erwin Klaas	
Boone County	Thomas Foster	
Boone County SWCD	Kevin M. Griggs	
Webster County	Keith Dencklau	
Webster County	Sam Adams	
Hamilton County	Jean Eells	

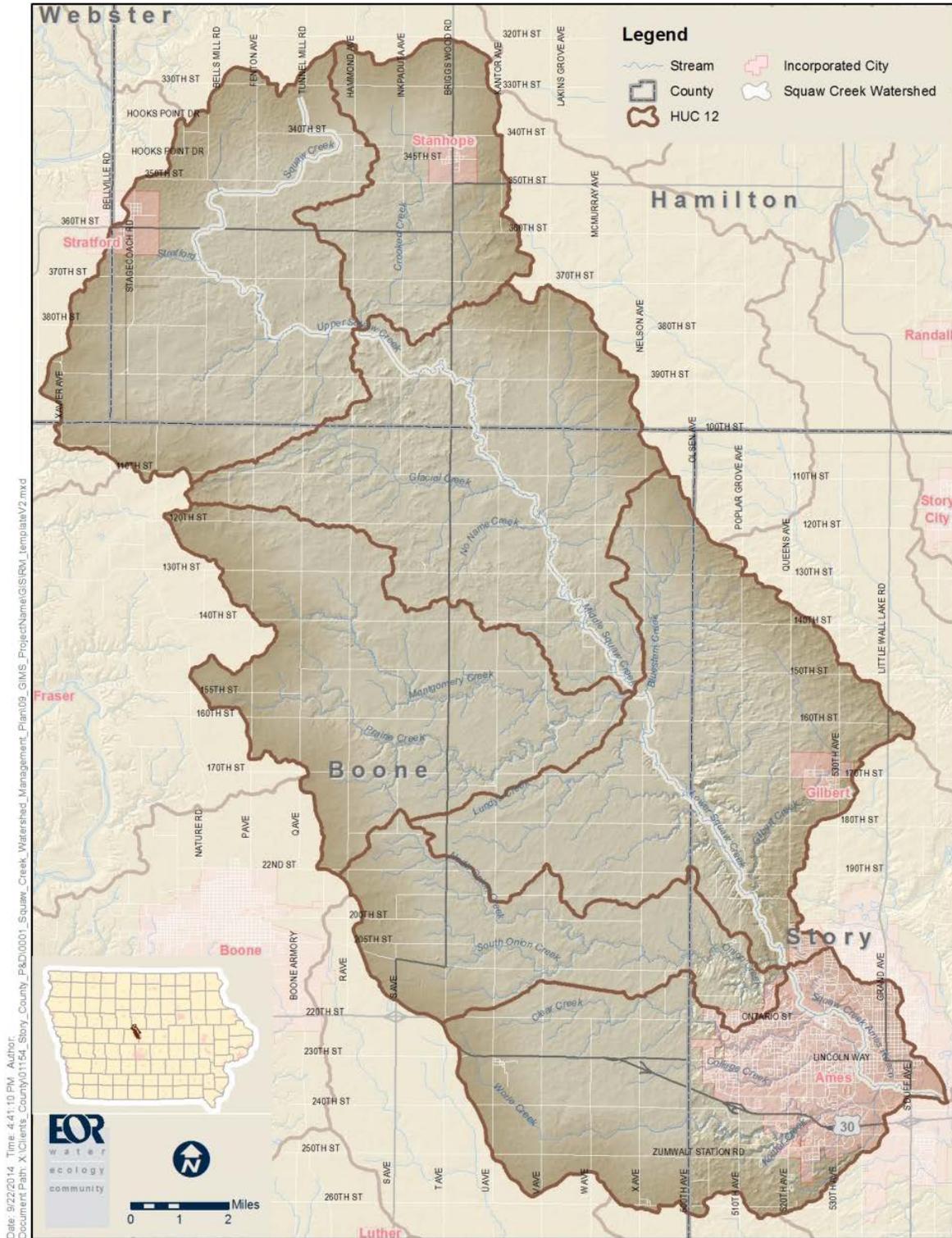


Figure 1-1. Political Subdivisions within the Squaw Creek Watershed

1.2. Acknowledgements

The Squaw Creek WMA members would like to thank the following individuals for their contribution to the planning process:

Leanne Harter, Darren Moon – Story County

Chris Anderson, Tom Isenhardt - ISU

John Dunn, Tracy Warner – City of Ames

Willie Ubben – Local Contractor

Mark Tomer, David James, Sarah Porter – National Laboratory for Agriculture and the Environment

Mary Skopec, Iowa DNR

John Pohlman, Mike Lazere, Rick Dietz – Squaw Creek Watershed Coalition

1.3. Plan Development Process

This plan was developed through a series of workshop meetings with the Squaw Creek WMA Board of Managers. The initial meetings in the process were used to discuss the fundamentals of watershed management and to describe the challenges facing the Squaw Creek Watershed. An overview of the watershed assessment was provided as a means to describe the general condition of the watershed and the quality of its resources. Additional detail from the watershed assessment was provided at each subsequent meeting. As the technical aspects of the watershed assessment were being formulated, the WMA Board appointed a Technical Advisory Committee to review information and to provide input on technical matters. In the late winter and early spring of 2013 a series of listening sessions was held with the public in several locations throughout the watershed. The purpose of the listening sessions was to introduce people to the newly formed WMA, to describe the watershed management planning process and to solicit input on the plan. The meetings had an educational element in that watershed management basics were described and the condition of the Squaw Creek watershed was summarized. A summary of the issues that were raised by the public at the listening sessions is provided in Appendix 2: Listening Session Input.



Figure 1-2. Listening Session in Stanhope, IA