



Clear Creek Watershed: 150 years of landscape change

FACT SHEET

ISSUE AT HAND

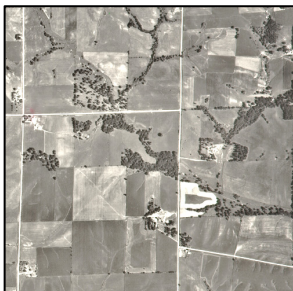
Significant opportunities exist to improve the overall health and functioning of agricultural watersheds. These opportunities should be evaluated at landscape scales and be attentive to where these watersheds have been in the past, as the history of a watershed has enduring effects on its present and future condition.

We conducted two studies of landscape change within the Clear Creek watershed of Iowa and Johnson counties, Iowa. These studies were designed to produce a baseline for assessing future changes in the watershed. Additional goals of the research included identifying time periods with significant change and informing ongoing conservation efforts.

OUR METHODS

The first study assessed changes in three landscape features—land cover, stream sinuosity, and housing density—within the watershed from 1940-2002 using historic aerial photographs. This work revealed that forest cover has substantially increased within the watershed over the last ~65 years.

The second study then extended these results further into the past—to the mid-1800s—to locate remnant natural areas. Aerial photos were used in conjunction with original Public Land Survey records (1832-1859) and historic Iowa state atlases (1875, 1904)



to examine changes in land cover within the watershed since the area was first settled by the pioneers.

WHAT WE FOUND

- Considerable landscape change has occurred within the Clear Creek watershed between the mid-1800s and today. From 1840 until approximately 1900, the mosaic of prairie, forests, and wetlands that had made up the native vegetation in the watershed was rapidly converted by settlers into fields, pastures, farms, and home sites. During this time period, forest cover declined within the watershed by approximately 44%.
- In the 20th century, forest cover in the watershed increased by nearly 3,000 acres. As of 2002, there was about 5,800 acres of forest in the watershed, often concentrated along streams. This increase in the amount of forest may have positive implications for water quality in the watershed.
- We found locations in the watershed that appear to have been continuously forested since mid-1800s. These remnant natural areas may contain critical components of biodiversity today.
- From 1940-2002, crop cover declined within the watershed—the total area of crop land declined by ~15%. At the same time, both urban cover and the density of houses increased dramatically, and at a growing rate in recent decades. The urbanization of formerly rural land in an important issue in Iowa.
- A decline in the sinuosity of the main stream channel of Clear Creek was observed from 1940-1963, and many present day stream segments are much straighter than in 1940. While some Iowa waterways were historically straightened by natural forces, over 3,000 miles of rivers and streams in the state have been channelized since the early-to-mid 1800s, primarily to facilitate agricultural land-use.
- The present-day watershed is dominated by agricultural land use, much as was the case in 1940. Increases in both urban and forest cover, especially in recent decades, suggest that these cover types may become more common within the watershed in the future. Shifts in relative dominance of these cover types (crop, forest, and urban) may have important ecological and social implications for residents.
- For examples of these landscape changes in the watershed, see our online gallery: http://www.nrem.iastate.edu/landscape/projects/ccw/gallery/ccw_interactive.html.

ADDITIONAL INFORMATION

Andrew P. Rayburn
515-460-0456
rayburn@cc.usu.edu

Dr. Lisa A. Schulte
515-294-7339
lschulte@iastate.edu

Iowa State University
Landscape Ecology &
Sustainable Eco-
system Modeling Lab
515-295-2957
<http://www.nrem.iastate.edu/landscape/lab>

Iowa State University
Dept. of Natural
Resource Ecology &
Management
515-294-1458
<http://www.nrem.iastate.edu>



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