

BUR OAK SAVANNAS

The Bur Oak (*Quercus macrocarpa*)

The bur oak is found throughout the state of Iowa. Found widely over the eastern United States and stretching in range as far west as Montana and western Texas the bur oak grows in a wide range of soils from deep rich bottomlands where it can quite large attain a large size, to dry ridges and western slopes where the tree is small and gnarled. It is strong-branched, usually with a dense crown. Often reaching ages of 300-350 years the bur oak is usually the only tree on hillsides in western regions of Iowa at the age of 200-300 years of age.



The single leaves have five to nine rounded lobes, with a large end lobe. The leaves are divided in half near the center with a deep lobe almost to mid-vein. The leaves are dark shiny green above, and light green to gray below with the bottom-side of the leaf usually somewhat hairy. The top portion of the leaf is more wavy than lobed.

The acorn is almost round with a bur or moss-like, fringed cup covering half or more of the acorn. It is the largest of all the oak acorns. These acorns provide an important food source for wildlife.

The thick, deeply furrowed bark breaks into distinct ridges. On small branches and twigs it is brownish, roughened and corky.

What is a savanna?

A savanna in Iowa can be defined as a plant community. This community consists of open-grown trees growing as scattered individuals or in small groves with an herbaceous under story. The scattered trees have a relatively open canopy that allows the sunlight to penetrate to the ground. This allows sun loving plants such as prairie grasses and forbs to flourish. The Loess Hills savanna would have prairie grasses as the herbaceous cover.

Where do they occur?

A savanna occurs in the transition zone between the eastern forests and the prairies to the west. Types of vegetation found in these transition zones are influenced by soil, topography, climate, grazing animals, aspect and fire.



How to recognize a savanna.

Very few savannas now appear as they did around the time of settlement. The Euro-American settlers altered the landscape and suppressed fire, which allowed the fire intolerant woody vegetation to encroach into the prairies and savannas.

Fire played a major role in the original establishment of oak savannas. The intensity of the fire was determined by the fuel load and weather conditions. The fuel load was determined by the soil, topography, climate, aspect and grazing animals. The drier conditions of the prairie dominated area allowed more frequent fires to burn the fuel. Oak trees are less susceptible to fire damage due to their thick bark. Therefore, the oaks were able to encroach into the prairie in this transitional zone while other trees were held back by fire.

Today, savannas appear to be more dense forests, with scattered big trees and lots of brushy understory. Many types of trees will be interspersed between the widely scattered oak trees.

PROJECT PARTNERS

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The Nature Conservancy

The Loess Hills Alliance

Iowa State University,
Forestry Extension

Iowa State University,
Harrison County Extension

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CONTACT INFORMATION

To find out more about this project :

<http://www.goldenhillsrcd.org/projects/buroak>

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The Iowa Bur Oak Savanna Project



“Inspiring and memorable in size and presence, irresistible to wildlife.”

National Arbor Day Foundation

BUR OAK SAVANNA OF THE LOESS HILLS

OAK SAVANNA RESTORATION

Oak savannas that have been invaded by other woody species can be returned to conditions similar to pre-settlement times. Restoration and management of savannas is an ongoing and continuous activity. These activities require an investment of effort, time and money for this type of endeavor to be successful.

Marking the oak trees in the area of interest will help you to determine the number and spacing. It will also help you determine which trees to leave and which trees to cut during the restoration project. Keep in mind that enough trees must be cleared in order to allow sunlight to penetrate through the canopy and to the ground for grasses and forbs to grow.



Please contact a DNR Forester for assistance or more information by phone at (515)-242-6898.

Why is savanna restoration important?

- Native landscape feature
- Local ecotype features maintained
- Grazing system component
(improved forage production, shade)

What benefits do we receive from savannas?

Results from research conducted for this project indicate that a restored savanna will have significantly less soil erosion and downstream sedimentation than a savanna degraded by woody vegetation and grazing. Adding a grazing component to a restored savanna will increase erosion, but erosion can be maintained below a tolerable level with the use of proper grazing techniques.



- Water runoff
- Soil erosion
- Enhanced grazing systems
- Sustainability of oak savannas

OAK SAVANNA MANAGEMENT

Management and Restoration Tips:

- Identify and mark the oak trees to be saved
- Large unwanted woody vegetation can be cut by machine or by hand-clearing.
 - Cutting brush can be accomplished through many methods. Hand clearing with chainsaws will be less damaging to the environment but will take a large time commitment.
 - Tree shears mounted on a skid loader (or similar machine) can greatly speed up the process of cutting trees but will increase erosion and water runoff versus the hand clearing method. Large diameter trees may still need to be cut by chainsaw due to limitations of the tree shear.
 - Bulldozing can be used for clearing woody vegetation, but is not recommended for savanna restoration on a large scale. Bulldozing greatly reduces the litter layer and leads to increased soil erosion and water runoff. Due to the disturbance of soil, this area also experiences more thistle and other noxious weeds.
 - The woody vegetation that is cut can either be left in place or can be removed from the site. The wood left in place can be used as a fuel load for fire if you choose to use this restoration component. Piling the wood prior to burning can increase the heat of the fire and sterilize the soil underneath.
 - Remnant grasses and forbs as well as a seed bank may be present and allow a good stand to re-establish. If the woody vegetation that encroached was thick and had been in place for many years, seeding of grasses and forbs may be necessary to reestablish a stand.
- The use of fire can be incorporated into the savanna restoration to help remove debris from the clearing operation, keep unwanted woody vegetation from invading back into the savanna, and improving the grass and forb stand under and around the oak trees. Fire can be an important tool to:
 - Eliminate the woody vegetation that has been cut down
 - Reduce competition of under story brush
 - Create/maintain open mid-story
 - Control woody resprouts
 - Stimulate the expansion and reproduction of herbaceous plants
 - Remove surface litter
 - Expose soil for seed germination
- Examine the canopy to ensure that it is open enough to allow light to penetrate to the ground.
- A mixture of native grasses and forbs may need to be seeded under the trees if there is not a sufficient number of remnant plants or a seed bank in the soil. (try to use local ecotype collected seed)

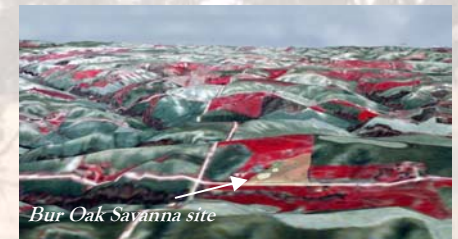


PROJECT RESEARCH

This “first-of-a-kind” project in Iowa researched, developed and demonstrates a system that shows the value and need for bur oak savannas within the Loess Hills landform region of western Iowa. These special bur oak savannas are an important component to holding soil in place, adding value to local cattle operations and as a riparian forest management tool for watershed improvement. This multi-faceted approach aimed to decrease sediment load, improve water quality, and preserve watershed integrity through the identification and restoration of bur oak savannas. The primary objectives of this project were focused on several key areas.

Geographic Information Systems (GIS) and Remote Sensing

The process of identifying known and probable bur oak savanna locations utilized several geospatial technologies. A system was developed using several mapped layers in a process to identify a “signature” or recognizable patterns of the landscape to distinguish bur oak savannas from other elements of the landscape. For more info — <http://www.goldenhillsrscd.org/gis>



Demonstration Sites and Restoration Treatments

Restoration projects were located in the Soldier River watershed in western Iowa. Two sites were selected for various forms of restoration. Both sites had existing savannas that had been degraded by encroaching woody vegetation. One site was located on state-owned property while the other site was privately owned.

Rotational Grazing Systems

Two pasture walks were held over the course of the project to demonstrate ways to utilize cattle in an intensive rotational grazing system as part of the restoration attempt.

Conservation Education Field Days

Private landowners met with resource professionals at both research locations to see demonstrations and discuss various restoration and management techniques. Contact ISU Forestry Extension for upcoming field days. (<http://www.forestry.iastate.edu/ext/ext.html>)

Restoration Treatments

Restoration of the degraded savannas focused primarily on the removal of unwanted woody vegetation. Each of the two restoration sites were divided into four treatment areas. One area at each site was left as an untreated check for test purposes. The sites also underwent treatments of bulldozer clearing, tree shearing, and hand clearing via chainsaw.