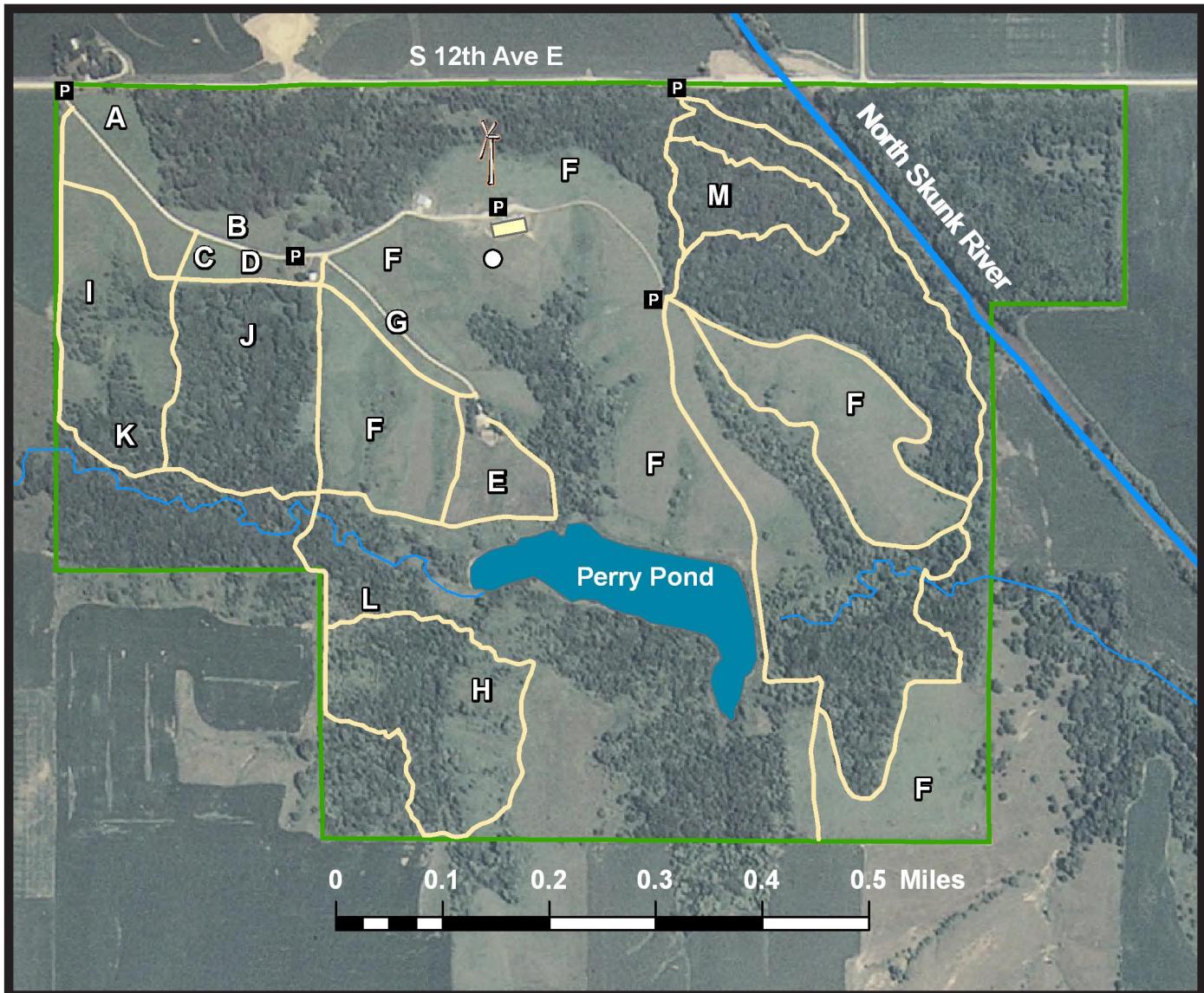


Conard Environmental Research Area



Conard Environmental Research Area



The Conard Environmental Research Area (CERA) is a 365-acre preserve located about 15 miles west of Grinnell. It is owned and managed by Grinnell College.

To get to CERA using Interstate 80, go west about nine miles from Grinnell to the Kellogg exit (173). Turn north on Highway 224 and go approximately a quarter mile to the first gravel road (South 12th Avenue East). To get to this point using Highway 6, go west about nine miles to Highway 224 (the Kellogg intersection). Go south one mile to the first gravel road (South 12th Avenue East). Then go east on this gravel road about a mile and a half to the CERA entrance on the right. It is clearly marked with a large sign. There is a parking area immediately inside the entrance, another one-third of a mile down the lane on the right, another a quarter mile farther on at the Environmental Education Center, and still another a quarter mile farther at the end of the gravel lane.

Legend

- Wind Turbine
- A Letters Referenced in Text
- P Parking
- Environmental Education Center
- Prairie Cairn
- Trails
- ⚡ Perry Pond
- ~ Willow Creek
- North Skunk River
- Preserve Boundary

Still another parking area, which gives access to the forest trail, is located just off the county gravel road one third of a mile east of the main entrance just before the bridge over the North Skunk River.

CERA's noteworthy natural habitats include large areas of reconstructed prairie, restored oak savanna, and high quality woodland. At the preserve, Grinnell College students and faculty study a wide range of biological and resource management topics. It has also been used extensively by art students. CERA is open to the public, and the College encourages its use for activities compatible with its purpose, including hiking, bird-watching, photography, drawing and painting, and other no-impact types of nature study and enjoyment. Regulations for visitors are the following:

- Do not enter experimental areas or disturb equipment, flags, stakes, or markers.
- Do not remove anything, pick flowers, or disturb plants, fungi, or animals.
- Motorized vehicles are allowed only on designated roads.
- Park in designated areas.
- Bicycles may be used on roads and firebreaks, but not on woodland trails.
- Horses are prohibited.
- Hike on marked trails or mowed firebreaks.
- Dogs must be kept under control at all times.

A network of well-maintained and clearly marked trails leads around and through the various habitats of CERA. Many of the units are posted with interpretive signs describing key species and management practices.

History

The land that today forms CERA was historically used for crops and pasture starting in the mid-19th century. However, already in the early 20th century, Grinnell College biology professors and students visited its forest, taking the train to Kellogg and then walking to the property.² In 1968, the College purchased the 365 acres and named it to honor Henry S. Conard, an inspiring professor of botany at the College from 1906 to 1944 and an authority on Iowa's flora and natural history. In the years of College ownership, Perry Pond was constructed (1972), Graham Lab was built (1983), and the modern Environmental Education Center opened (2005). A program of intensive management and restoration was begun early on. By 1988, all former cropland had been planted to native prairie grasses. More recently, management goals have been to increase species diversity, restore prairie and oak

savanna remnants, control exotic species, and reintroduce fire to all habitats.

Historic and recent aerial photographs are included at the end of the description for this preserve. The aerials serve as a visual confirmation of the changes in the vegetation over time that are referred to in the text.

Prairie

About 115 acres of prairie have been reconstructed on formerly cropped land. The plantings range in diversity from several large areas that contain primarily the four originally seeded grass species (big bluestem, little bluestem, Indian grass, and switchgrass) to smaller areas that have been enriched with up to 80 species of forbs. The most diverse are the areas along the entrance road. The first one (**A**) is burned annually in the fall. The second ("Deaner Prairie," **B**), the most diverse prairie at CERA, is burned every two or three years, usually in the fall. On the other (south) side of the entrance lane, the west part (**C**) is burned every three or four years. For comparison, the unit just to the east (**D**) is left unburned. Another area that has been enriched with forbs is the prairie just to the south of the Graham Lab (**E**). Species growing in these diverse prairies include lead plant, compass plant, prairie dock, white wild indigo, pale purple coneflower, purple coneflower, thimbleweed, Ohio spiderwort, foxglove, showy goldenrod, and New England aster.

A number of CERA prairie reconstructions consist primarily of the originally seeded tallgrass species (**F**). They have not been enriched with forbs, but some aggressive species have colonized naturally, including tall goldenrod, sawtooth sunflower, and heath aster.

On either side of the road leading to the Graham Lab, a series of 38 experimental plots, each 10 by 20 meters square, has been laid out (**G**) to study effects of fire (including the timing of it and the absence of it) on prairie growth, flowering, and seed production. Students also study soil properties, invertebrates, and other aspects of prairie ecology.



white wild indigo



showy goldenrod

² This information and what follows is derived from the pamphlet "CERA: Conard Environmental Research Area" © Grinnell College 2002 and from the CERA website (www.grinnell.edu/academic/biology/cera). Visit the website for much more detailed information.

A small remnant prairie across Willow Creek in the southwest corner of CERA (**H**) is being rehabilitated through burning and removal of woody species. Among the forbs present here are lead plant, rough and prairie blazing star, and butterfly milkweed. Two species uncommon in our area that grow in the remnant are Hill's thistle and Great Plains ladies'-tresses.

Savanna

In the 1980s, Karl DeLong, at the time a professor of biology at the College and CERA director and restoration manager, began some of the first savanna restoration in Iowa in the approximately 35 acres marked **I** and **J** on the map. Prior to College ownership, the areas had been heavily grazed. Aerial photos show only large oaks set in grassland. After grazing ended, invasive trees such as elm and white mulberry and shrubs such as multiflora rose became established. By the 1980s, according to DeLong, this encroachment "had turned the grassland between the large oaks into a thicket of native and exotic woody plants."²

Clearing began in 1989, and ground-layer burning began shortly thereafter. Native forbs and grasses known to occur in this habitat were selectively interseeded. The extensive thinning has increased the availability of light to the oaks and to the herbaceous vegetation. Regular prescribed burning has helped to suppress unwanted woody species and to stimulate the

Other areas of degraded oak savanna at CERA (**K** and **L**) are slowly being restored through this same process of thinning, interseeding, and burning.

Woodland/Forest

The distinction between savanna and woodland or forest is not clear cut, either in theory or on the ground. Experts use various percentages of canopy cover and what grows beneath it to distinguish several categories. In one classification, savanna has 5 to 30 percent coverage, closed savanna 30 to 70 percent coverage, and woodland and forest more than 70 percent. Forest is distinguished from woodland by having a woody understory.³ In reality, they blend. For example, the open savanna at **I** becomes closed savanna and woodland south toward Willow Creek and in the central and eastern part of **J**.

At CERA, there is an especially nice forest, with understory trees and shrubs, on the bluff above the North Skunk River and on the slopes leading down to its flood plain (**M**). This approximately 40-acre area was probably forested for 1,000 years until logged in the 1860s to aid railroad construction. In the years following, although the area was no doubt grazed, an upland forest consisting of white oak, shagbark hickory, red oak, basswood, and ironwood became re-established. In the spring, a rich variety of wildflowers covers the woodland floor. Starting in mid-April, the delicate pink and white blossoms



bottlebrush grass



spring beauty



prairie trillium

growth and flowering of grasses and forbs, both those that have been added, like bottlebrush grass, and those that have been revived. More open parts now have grasses typical of prairie, including big and little bluestem, Indiangrass, switchgrass, prairie dropseed, and porcupine grass. Forbs include prairie violet, New Jersey tea, cream gentian, and white prairie clover, among others. Under greater canopy cover, plants such as sweet cicely and white snakeroot are more common.

and grass-like leaves of spring beauty create a carpet of color against the dull brown-gray of the dead leaves. Following rapidly over the next few weeks are bluebell, rue anemone, dogtooth violet, toothwort, Dutchman's breeches, prairie trillium (which in spite of its common name is a rare woodland plant), and many others.

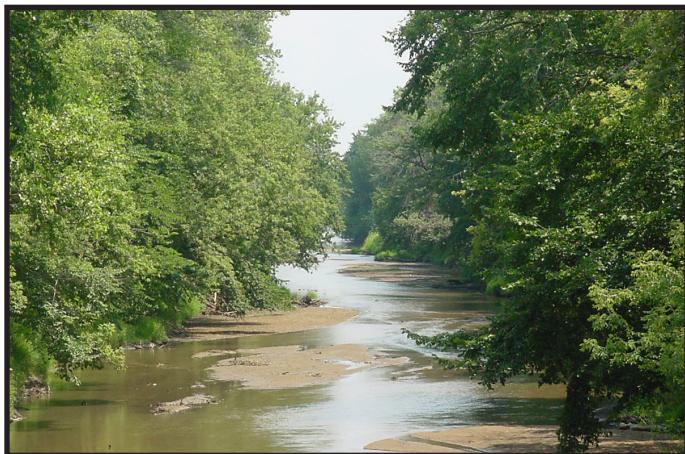
A checkerboard of 19 plots 25 meters square has been established along a central ridge top to test the effects of annual autumnal fire on the ecosystem. Otherwise the management of this woodland has not included controlled burning.

2 Karl DeLong, "Savanna Restoration at the Conard Environmental Research Area (CERA) of Grinnell College." Presented at an Iowa Department of Natural Resources State Park Meeting, Nov. 4, 1998, 2.

3 Summarized in DeLong, 13.

Aquatic

Several types of aquatic habitats at CERA have provided sources of inquiry for college students. The North Skunk River flows through the northeast corner of CERA. Although the river was channelized by the U.S. Army Corps of Engineers in the 1920s, some of the original oxbows are still evident within the river's historic forested floodplain. The river is highly polluted with sediment and varies greatly in flow, often meandering only as a small stream within its channel during the summer. Beavers have been trapped and extirpated from many creeks and rivers in Iowa, but CERA staff have been pleased to see beavers near the South 12th Avenue East river bridge and evidence of their tree harvesting in the floodplain. Bald eagles are often seen perched in the trees on the riverbank during the winter.



North Skunk River

Willow Creek flows east through CERA and drains into the North Skunk River about a mile past CERA. The creek flows all year round, fed in part by smaller, usually ephemeral creeks that flow from springs in upland areas. Students have studied nutrient levels in this creek and have searched for insects.

In 1972, a dam was built across Willow Creek to create another type of aquatic habitat for wildlife and research. Perry Pond filled in 1972 with 14 surface acres of water. It is about 14 feet deep and supports largemouth bass, bluegills, green sunfish, frogs, and many aquatic invertebrates. Dragonflies and damselflies are very abundant around the pond during the summer.

Of Special Note

The Environmental Education Center is a 7,500-square-foot teaching and research facility with classroom, lab, greenhouse, and office space. Its sweeping south window wall looks out onto a broad expanse of prairie grassland. The building has a high-efficiency geothermal heating and cooling system and graywater recycling, and local and recycled materials and certified wood products were used throughout.

These "green" features have earned it Iowa's first Leadership in Energy and Environmental Design (LEED) Gold Certification by the U.S. Green Building Council, a national standard for high-performance, sustainable buildings. The building is open to the public during normal weekday business hours. The classrooms may be in use during this time, but the restrooms, drinking fountains, information kiosk, and hallway displays are open to the public. Weekend tours of the facility can be accommodated if arrangements are made one to two weeks in advance.

In the prairie just south of the Environmental Education Center is a stone cairn built by British artist Andy Goldsworthy in the spring of 2001. It is made from Iowa limestone using dry-stone construction. It was photographed over a period of 18 months to document the sculpture in varied conditions, including during a prairie burn in 2002. The resulting suite of panoramic images is now in the collection of the Des Moines Art Center. Goldsworthy often creates temporary sculptures outdoors, which he photographs as they change with their environment. Although considered a temporary work, the *Prairie Cairn* should last for decades before succumbing to the effects of weather.

In January 2007, a wind turbine was erected to provide more than 90 percent of the electricity needed by the Environmental Education Center. The 120-foot tower supports a 50 kW generator with 49.2-foot blades.

To learn more about the "green" features of the facilities at CERA, visit the kiosk website at: cera.grinnell.greentouchscreen.com.

Contact Information

For information about CERA, to arrange a tour, or to inquire about volunteering, contact Larissa Mottl, CERA manager, at 641-269-4717 or mottl@grinnell.edu. Extensive information about CERA is available at www.grinnell.edu/academic/biology/cera.



Prairie Cairn



Environmental Education Center and wind turbine

Aerial Photographs of the Conard Environmental Research Area

Please note that the preserve boundaries indicated on these aerial photographs are approximate. When visiting this preserve, please note signage and respect preserve and private property lines.



1930s



1955

Aerial Photographs of the Conard Environmental Research Area



1967



1994

Aerial Photographs of the Conard Environmental Research Area



2004



2007

