

# Biocore Prairie Restoration Project Report

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**Prairie Management Team:** Janet Batzli, Seth McGee, Curt Caslavka, Evelyn Howell, Ann Burgess

## Overview

The Biocore Prairie is an 11.8 acre prairie restoration located in the Lakeshore Nature Preserve and managed by the Biocore program under permit since 1997. The prairie is habitat to more than 110 prairie plant species native to South Central Wisconsin and a vast array of insects, birds, amphibians, small and large mammals. The Biocore Prairie vegetation, animals, soil macro- and microbiota, physical environment, and ecosystem are being studied, monitored, inventoried, and enjoyed by a diverse group of students, UW community members, and the public. The Biocore Prairie is now a recognized destination and a valuable natural landscape within the Lakeshore Nature Preserve.

This report provides information on the overall goals, relevant site history, management approach, estimated impact, current expenditures, land management status for 2014 and 2015, and plans for 2016. For more background, see Biocore Prairie Annual Report 2013 and other previous reports.

## Project Goals

1. Establish a prairie ecosystem in accordance with the 2006 Lakeshore Nature Preserve Master Plan with implementation to include a diversity of prairie plant communities (dry, mesic, and wet)
2. Engage Biocore students in the process of scientific research in field biology and in the process of ecological restoration and stewardship through classroom projects and summer field work
3. Support restoration efforts as an outdoor living laboratory
4. Engage and collaborate with other UW faculty/ staff, courses, and programs in education, outreach, and research at the Biocore Prairie

Central to this restoration project is *ecological education*.

Our instructional goals are to teach ecological principles and procedures as well as research design and analysis to Biocore students through the process of restoring an abandoned agricultural field to prairie (Figure 1). The Biocore Prairie serves as a site for undergraduate research projects, the home of the Biocore Prairie Bird Observatory (see separate report- Mara McDonald), for outreach and service learning opportunities, and for collaborative research and teaching efforts with other UW-Madison programs and departments. In addition to Biocore courses, the prairie is used by a wide array of other UW courses, including Wildlife Ecology, Ornithology, Landscape Architecture, Civil & Environmental Engineering, and for both undergraduate and graduate student research and outreach projects throughout the campus community.



Figure 1. Biocore 382 (Ecology, Genetics, Evolution lab) students developing and implementing ecological research projects in Fall 2015. Left to right: fire frequency on forb and grass density; influence of galls on Canada goldenrod growth; flower color and pollinator attraction.

**Location and Site description** The Biocore Prairie is situated at the base of Picnic Point adjacent to the Eagle Heights Community Gardens, Second Point Woods, Caretaker Woods, the Old Orchard, and Anthropology and Art Kilns. The site consists of three main areas (east, central, and west) that include established mesic, dry, dry-mesic prairie plant communities and a future wet-mesic community (Figure 2).

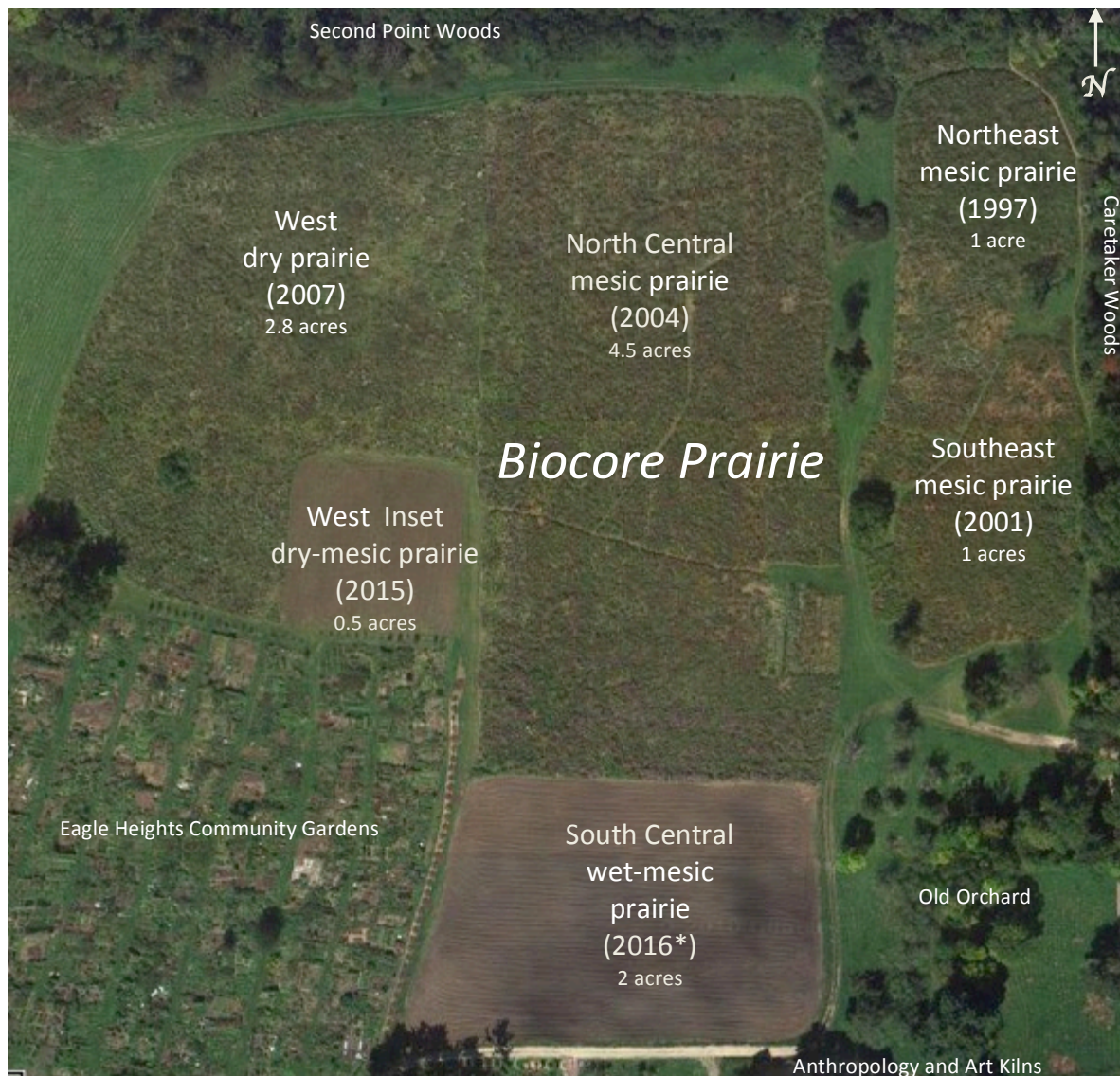


Figure 2. Biocore Prairie aerial photo (Sept. 2010 Google Earth) indicating established and intended prairie communities, area size, and dates planted (\*estimated planting date Fall 2016).

### Relevant Site History

In 1997, following the Kline-Bader report, the Biocore staff and students began the Biocore Prairie restoration project. Before then, the site was an old agricultural field that had been used as a soil and organic waste dump site and had accumulated a large bank of weed seeds in the soil. The Southeast mesic prairie area was originally covered with a large pile of soil put there during construction of the UW Hospital. The South Central area was a dump site for a floating bog that had piled up on the shore of Lake Mendota in the mid 1990s. In addition to these factors, historic use of the site, time of planting, neighboring plant communities, physical soil properties, topography and the Lakeshore Nature Preserve Master Plan all have influenced the planning, implementation and establishment of the Biocore Prairie.

## Management Approach

The process of ecological restoration is an evidenced-based, research-based effort to manage land toward a specific ecological outcome (Howell *et al.* 2012). The Prairie Management Team has utilized an adaptive management approach for small to large scale planning and implementation in each of the intended prairie communities (Figure 2). Adaptive management is a systematic process of selecting practices based on documented evidence in research literature or success at analogous sites, experimentally adapting those practices to a new site, and using the results to plan the next step. Adaptive management in each area of the Biocore Prairie has been iterative and subject to continuous evaluation and review. This approach has resulted in an established, robust natural prairie community within the Lakeshore Nature Preserve.

## Management, Planning, and Implementation

Janet Batzli and Seth McGee have served as the Biocore Prairie project leaders since 2002. Batzli is the Associate Director of the Biocore program and the lead instructor for Biocore 382, Evolution, Ecology, and Genetics Laboratory. She has a PhD in plant ecology and directs the prairie restoration project. McGee serves as Biocore Lab Manager and is co-instructor for Biocore 382. He is an expert naturalist who supervises the prairie crew and leads the management efforts of the prairie restoration.

The Prairie Management Team includes Batzli (Chair), McGee, Evelyn Howell (Prof. of Landscape Architecture and a prairie restoration expert), Curt Caslavka (retired Biocore Lab Manager, founder of Biocore Prairie, and restoration expert), and Ann Burgess (retired Biocore Director, founder of Biocore Prairie, and active volunteer with the Lakeshore Nature Preserve).

Along with the considerable expertise of our Prairie Management Team, the group regularly consults with experts from the Prairie Enthusiasts, Michler & Brown Ecological Restoration, Quercus Land Stewardship Services, faculty in the Departments of Agronomy, Soils, and Landscape Architecture. Specific experts include Mark Renz (UW Agronomy professor and weed ecologist), Mark Martin (Manager of Audubon's Goose Pond prairie restoration project), Willis Brown and Chris Knief (Mickler and Brown), Steve Glass (UW Arboretum prescribed burning), Jim Elleson (Quercus), Tom and Kathie Brock (Managers of Pleasant Valley Conservancy), and Alison Duff (International Crane Foundation ecologist).

Small-scale land management, such as hand weeding, hand planting, spot spraying, and mowing, are planned by McGee & Batzli and implemented by McGee and the Biocore Prairie Crew (a group of 5-8 Biocore student hourly workers).

Large-scale land management tasks, such as tilling and plowing, herbicide application, prescribed burning, crop planting and harvesting are recommended by the Prairie Management Team, and then discussed, revised, and approved by Laura Wyatt (Lakeshore Nature Preserve program manager) through the Biocore Prairie Restoration Project permit. Implementation of large-scale land management is done by or in consult with Tom Wright (West Madison Ag Station), an approved restoration contractor (prescribed burn & herbicide application) and Adam Gundlach (Lakeshore Nature Preserve field projects coordinator).

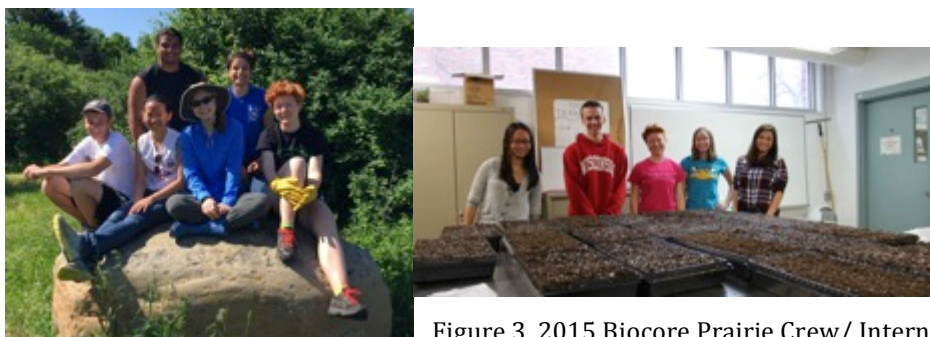


Figure 3. 2015 Biocore Prairie Crew/ Interns

## Major Activities, Impact & Expenditures – 2014 & 2015

Date	2014 Activities
4/6/14	Successful burn- all areas except for West Inset and South Central (Quercus, Inc.) (Figure 4)
4/25/14	South Central area – tilled north 30 m and planted tilled and no-tilled areas in oats (West Side Ag Station) (Figure 4)
<p><b>Courses</b></p> <ul style="list-style-type: none"> <li>• Biocore 381- field activities ~ 60 students</li> <li>• Biocore 382- 110 students, 6-week ecology unit- small groups (3-4 students) develop and implement ecology research projects</li> <li>• Biocore Prairie Crew- 5 students work 16h/ week May to Sept doing weed management, transplanting, mowing and data collection</li> <li>• Botany 455 (Vegetation of Wisconsin) ~ 20 students do projects</li> </ul> <p><b>Biocore Undergraduate Independent Research</b></p> <ul style="list-style-type: none"> <li>• Cristina Fisher &amp; Francis Shepard (Janet Batzli)- To Till or Not to Till: Spread and establishment of Canada thistle in Biocore Prairie</li> <li>• Emma Geiduschek (Ellen Damschen &amp; Janet Batzli)- Root frost tolerance of <i>Solidago</i> conspecific native and non-native species</li> </ul> <p><b>Faculty &amp; Grad Research Projects</b></p> <ul style="list-style-type: none"> <li>• Snow depth and climate change: influence on plant community functional traits- Ellen Damschen, Laura Ladwig (Zoology)</li> <li>• Effects of clipping around endangered prairie bush clover (<i>Lespedeza leptostachya</i>) on plant growth- Ian Santino (Evelyn Howell, Landscape Architecture)</li> <li>• Granivory &amp; small mammal census- John Orrock (Zoology)</li> <li>• Insect study – Ken Raffa (Entomology)</li> <li>• Coyote and fox trapping- David Drake (Wildlife Ecology)</li> </ul> <p><b>Outreach</b></p> <ul style="list-style-type: none"> <li>• Biocore Prairie Bird Observatory- bird banding led by Mara McDonald</li> <li>• Friends of the Lakeshore Nature Preserve tours &amp; volunteer work days (e.g., seed collecting)</li> <li>• School group tours</li> </ul> <p><b>Expenses</b>            Student hourly stipends \$8,502            Supplies &amp; Expenses \$114            Services- West Side Ag Station till and remove oats \$2,217            In kind time of Biocore Lab Manager (McGee) and Associate Dir (Batzli) equivalent to 0.12 FTE            Lakeshore Nature Preserve funded Prescribed burn and mowing \$1,200</p>	

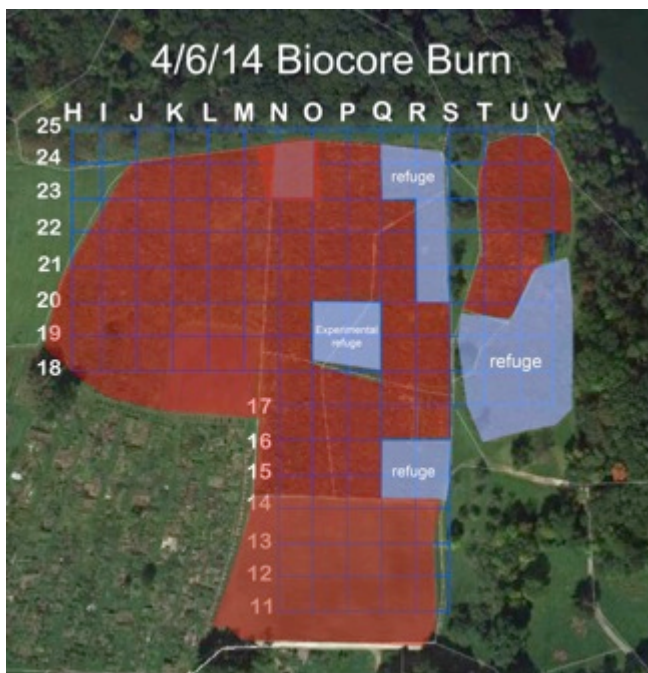


Figure 4. Burn plan (left) with unburned refuge areas indicated in blue. Till and no till plots in South Central Area.



<b>Date</b>	<b>2015 Activities</b>
6/15	Weed consult with Mark Renz (Agronomy), Jeb Barzen and Alison Duff (International Crane Foundation) for management of South Central area
7/3 & 8/17/ 15	Mow entire South Central and West Inset
7/15	Spurge plot spot spray; transplant big blue stem from nursery into southwest corner ('bad neighborhood') of North Central; hand weed all areas; seed collection and vegetation analysis
9-11/15	Seed collection in preparation for seeding West Inset
11/1/15	Spray and prescribe burn of West Inset in preparation for seeding
12/11/15	Planted West Inset- Biocore students and alumni planted 55 species of prairie plants (3.5 kg seed) collected on site, donated from Goose Pond Preserve or purchased from Agrecol.
<b>Courses &amp; Student Engagement</b> <ul style="list-style-type: none"> <li>• Biocore 381- field activities ~ 60 students</li> <li>• Biocore 382- 110 students, 6-week ecology unit- small groups (3-4 students) develop and implement ecology research projects</li> <li>• Biocore Prairie Crew- 6 students work 16h/ week May to Sept doing weed management, transplanting, mowing and data collection</li> <li>• LA 666- 6 students, project on feasibility and design of photomapping and monitoring points</li> <li>• ES 375- ~24 students, summer undergraduate field course on ecological methods including bird banding &amp; mammal trapping <a href="http://nelson.wisc.edu/news/story.php?story=2255">http://nelson.wisc.edu/news/story.php?story=2255</a></li> </ul> <b>Faculty &amp; Grad Research Projects</b> <ul style="list-style-type: none"> <li>• Pollinators and bee boxes- Emily Geinwald (Cathy Middlecamp, Nelson Institute)</li> <li>• Pollinator distribution and abundance- Martin Brubaker (Eagle Heights Gardens)</li> <li>• Citizen science study on pollinators- Elena West, WI Society Conservation Biology (William Karasov, Wildlife Ecology)</li> <li>• Ecosystem services study- Carly Ziter (Monica Turner, Zoology)</li> <li>• Root frost tolerance as a plant functional trait- Emily Nettescheim (Ellen Damschen, Zoology)</li> </ul> <b>Outreach</b> <ul style="list-style-type: none"> <li>• Biocore Prairie Bird Observatory- bird banding led by Mara McDonald</li> <li>• Friends of the Lakeshore Nature Preserve tours &amp; volunteer work days (e.g., seed collecting)</li> <li>• School group tours</li> </ul> <b>Expenses</b> Student hourly stipends \$7,749 Supplies & Expenses- \$1,801 (seeds) Services- Quercus, Inc. herbicide spray \$320 In kind time of McGee and Batzli 0.12 FTE  Lakeshore Nature Preserve funded Prescribed burn and mowing \$2,750	



Figure 5. Seed collecting, burning and planting West Inset (Area 5) on Dec. 10-11, 2015.