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In This Issue

Chicago WILDERNESS

Are you wondering how to tap into the growing pool of knowledge and tools resulting from the more than 200 projects that the coalition has facilitated and funded? Have you generated some great insights or data that you would love to share with others in this region who might find it useful in their work? In this essay, the chair of Chicago Wilderness proposes that the CW Journal *can become an ideal mechanism for CW partners to share results and learn from each other as we all work toward the goals of the* Biodiversity Recovery Plan.

Fertile Ground

John D. Rogner
U.S. Fish & Wildlife Service

Welcome to the inaugural edition of the *Chicago Wilderness Journal.*

At the launch of Chicago Wilderness eight years ago, we said that one of the fundamental reasons for creating the partnership was to foster region-wide communication and cooperation among the conservation community. We've not done a bad job at that. Some would say that the communication has at times been too much to assimilate, especially in the early years when in-boxes were buried beneath nodding onion letterhead. The paper assault has been turned back in part through web site improvements and the judicious use of other communication filters.

Despite being awash in communication, I will argue that the *CW Journal* is a forum that is long overdue. We share an enormous amount of information, but until now we have lacked an effective way to share our project results, experiences, and lessons learned. Considering the level of activity, innovation, and creativity of our members, the time is ripe for creating a dedicated interdisciplinary project-based communication forum for the region's conservation practitioners. It is clearly essential if we are to take best advantage of our successes.

And our regional conservation successes are legion, beginning with what I'll call the foundation of Chicago Wilderness. The Chicago region historically has been a center of conservation thought and action. Civic leaders at the beginning of the last century insisted that the region's woodlands and prairies were an essential counterpoint to urban life and began to set aside natural land in and around the footprint of the expanding city. This is the land base which we continue to expand and which legitimizes the very concept of Chicago Wilderness. Fundamental concepts of ecology were born on the lakeshore dunes in Indiana. This region nurtured the art and science of prairie restoration at places like Morton Arboretum and Fermi Lab and Somme Prairie Grove.

Hundreds of restorations have happened since, and continue to happen at Bartel Grasslands, Middlefork Savanna, Lockport Prairie, Glacial Park, Illinois Beach, Midewin National Tallgrass Prairie, Nelson Lake Marsh, Markham Prairie – the list could go on for pages. We have developed programs for getting thousands of citizens restoring and monitoring local nature through Mighty Acorns, Volunteer Stewardship Network, and the Habitat Project.

In the urban planning and outreach arena, we are taking our biodiversity conservation messages and tools to government planners and decisionmakers through a green infrastructure project, a native landscaping initiative, model conservation design ordinances, and guidelines for protecting nature in communities. We are exploring approaches for community-based conservation and working to better understand how biodiversity is valued among our diverse human communities. We are now investigating the possibility of seeking Biosphere Reserve designation through UNESCO's Man and the Biosphere program, which would garner the type of international recognition that would elevate local forest preserves to their proper status alongside (and geographically squarely between) tropical rain forests and arctic wilderness.

Under the Chicago Wilderness banner alone, over 200 projects have been completed or are in progress. Does anyone think we have nothing to write about?

A senior manager in my agency recently shared his view of the importance of communicating field office results and accomplishments with the statement that "if you don't report it, it didn't happen." This is the perspective of one whose job is advocating on behalf of my office and my organization. Of course, he knew the work was being done. But he couldn't talk up our accomplishments if he didn't know about them.

This is precisely the point of the *CW Journal*. Your great work will not realize its full potential if you do not share it with others. We will not be able to build on your successes, learn from your mistakes, or avoid reinventing the wheel.

Within the world class institutions of Chicago Wilderness we have top scientists, public policy advocates, educators, communications specialists, and land managers. All are engaged in project work, individually and collaboratively. Some of this work is done under the formal Chicago Wilderness umbrella, but much more is not. Collectively, this represents a huge body of knowledge and experience related to biodiversity conservation. A very small amount of this information is published in professional journals. A bit more goes into contract reports. But most remains undocumented and benefits only the project partners or others who share in it through conversation. The *CW Journal* is designed to get more of this information in print to so that we can more broadly share experiences, convey lessons learned, make recommendations, stimulate thinking, promote more project collaboration, and remain better connected to the larger regional conservation effort.

Projects supported through Chicago Wilderness dedicated funding are perhaps the most obvious first choices for reporting through the journal since they were supported because of their direct benefits to regional biodiversity conservation. Unfortunately, many of these have faded into obscurity since completion. A Chicago Wilderness land manager doing work on lichens and fungi contacted me some time ago to ask if I knew of any work that had been done to catalogue lichen occurrence and distribution in the region. Despite having served on the CW Proposals Committee at the time, I had only a vague recollection of just such a project that was funded in one of the early rounds. Through some sleuthing, eventually I was able to direct him to the project investigator. But clearly we lacked a good mechanism for feeding project results back into the land of the living, and my hope is that the *CW Journal* will become this mechanism.

The journal, however, is intended to go beyond CW-supported projects. It is a means to share the results of all of the important biodiversity conservation work we do, either individually or as collaborations. As such, it hopes to fulfill one of the most important functions for which CW was organized and which CW members have repeatedly re-affirmed as something they most value about the coalition. It is a way to coordinate and communicate the total biodiversity conservation effort in the region so that we work more effectively, efficiently, productively, and harmoniously. It will help us remain connected. I think you will also find that excellent work is sustained by communicating successes.

I look forward to reading about members' experiences and learned lessons. The power of these shared experiences, however modest or seemingly ordinary, should not be underestimated. Somewhere in your experiences will be sparks that ignite major new successes.

In 1991 my office of the U.S. Fish and Wildlife Service (USFWS) was brand new to the Chicago region. We came to the area with a mission and some resources, and with a few standard program areas, but with wide latitude to develop our own approach to carrying out our mission in a nearly exclusively urban and suburban setting.

While we set up shop we also looked for some projects to launch. Some proved to be false starts. But in the early winter of 1992 I ran across a short article in Restoration and Management Notes, the predecessor of *Ecological Restoration*. In the article (R&MN 9(2):121-122), Steve Packard described an experience where he had hand-pollinated flowers of the eastern prairie fringed orchid. The plants were not being pollinated naturally, presumably because the site did not support the natural hawk moth pollinators. The hand-pollination resulted in good seed set, and he later broadcast the seeds at three Cook County Forest Preserve District sites along the North Branch of the Chicago River.

After five years, several flowering orchid plants appeared at two of the three sites where seeds had been scattered. Meanwhile, the eastern prairie fringed orchid was listed under the federal Endangered Species Act as a threatened species. At the end of the article, he suggested that if restorationists could develop techniques for establishing new or larger populations of this rare orchid, perhaps it could be recovered and removed from the list.

Since a major program area for USFWS is the recovery of listed species, this seemed a promising opportunity for project collaboration. We knew of The Nature Conservancy's Volunteer Stewardship Network and thought that if we brought in some land managers and technical advisors and provided some modest program dollars to coordinate the project, we could enlist volunteers in a systematic program of hand-pollination, seed collection, and seed dispersal at sites throughout north-eastern Illinois.

The first couple years were modest indeed, but they served as a "test-drive" for the partnership and the project. Gradually we expanded, adding more sites and more volunteers, and developed standard protocols for pollination, collection and dispersal. We built in a research component with the involvement of Morton Arboretum and Chicago State University (demographics and propagation) and Chicago Botanic Garden (genetics). Our eager volunteers were trained not only to pollinate flowers and disperse seed, but to collect demographic data and plant

tissues, collect information on herbivory, and assess habitat conditions. We coaxed more intensive management of orchid sites from the land managers. The Illinois Department of Natural Resources and Illinois Nature Preserves Commission offered to help expand the project state-wide. We have shared our experiences with colleagues at national workshops and gleaned a bit of national recognition for our efforts.

None of this would matter, of course, if the project had not produced results. The volunteer program is responsible for starting six new populations including successful reintroductions into five historic sites, discovery of unknown populations, and augmentation of existing populations. Habitat conditions have been improved at many of the sites. Our understanding of orchid biology has increased, including the effects of in-breeding and out-breeding and the reproductive costs of flowering. For my agency, the partnership has served as a model for species recovery implementation and has demonstrated how and at what costs recovery might actually be achieved.

All of this because ten years ago someone took the time to publish one of those articles that said, "Here's what I did, here's what happened, and here's what we might think about doing in the future." This sounds a lot like the concept for the *CW Journal* -- a forum for sharing experiences, project results, and recommendations.

This is your journal. It will only succeed and you will only benefit if you read and contribute. So, please, write about your projects and experiences in these pages. Read about those of your colleagues. Share the journal by e-mailing it to your colleagues at your organization and other CW organizations. And I assure you that somewhere in this fertile ground of ideas and experience you will find some seeds that you might grow into new Chicago conservation successes.

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Natural Partners: Chicago Wilderness and Asset Based Community Development

Peggy Stewart
Chicago Park District

Through this project which links natural areas, environmental organizations and the assets of communities, Chicago Wilderness members have gained a valuable new tool for involving communities in their conservation work.

Background and Goals of the Project

Recognizing that community awareness and involvement is invaluable to the success of good conservation work (and with the community outreach goals of the *Biodiversity Recovery Plan* in mind), a number of Chicago Wilderness members formed a community based work group in 2001. This work group identified reaching diverse audiences as an important step in their work and decided to explore using a model of community development generated by Northwestern University's Institute for Policy Research called Asset Based Community Development to work toward accomplishing the following goals from the *Biodiversity Recovery Plan*:

- Increase the number of communities being reached with non-school based programs in biodiversity education
- Foster neighborhood and community-based programs aimed at improving the environment and biodiversity locally
- Create a diverse base of spokespeople who can serve as "ambassadors" for biodiversity to communities
- Improve the infrastructure within conservation agencies and organizations to better support community-based biodiversity projects

The group selected the Asset Based Community Development model because it is a successful community based process used throughout the country. This process was applied to the network of Chicago Wilderness members and communities they serve to create four models of community outreach involving biodiversity conservation in four distinct communities in the Chicago region. These models were very successful and can easily be duplicated in the Chicago Wilderness area and beyond.

Methodology

The Asset Based Community Development (ABCD) model is based on the fundamental belief that we all have gifts and talents that can be tapped into, and has most commonly been applied to urban community revitalization efforts.

Traditional approaches to community development usually involve top-down or outside-in approaches. An alternate approach involves pinpointing available local individual and associational assets, connecting them with one another in ways

that multiply their power and effectiveness and engaging local institutions that are not yet available for local development purposes. This approach assumes that social and economic revitalization start with what is already present in the community: the capacities of residents and the neighborhood's associations and institutions.

Like a glass of water filled to the middle, which can be viewed as either half empty or half full, a community can be seen as a half-empty place comprised of clients with needs and deficiencies, or a place half full of citizens with capacities and gifts to give.

Built upon three decades of community development research by John Kretzmann and John McNight, this model involves every layer of a community. The facilitators ask difficult questions and guide communities to find their strengths and their own answers. Who are we in this community? What do we value most? Where would we like our community to go in the next five, ten, twenty years? To mobilize a community, Kretzmann and McNight have identified the following steps:

- Mapping completely the capacities and assets of individuals, citizens' associations and local institutions.
- Building relationships among local assets for mutually beneficial problem solving within the community.
- Mobilizing the community's assets fully for economic development and information sharing purposes.
- Convening as broadly representative a group as possible for the purposes of guiding a community vision and plan.

More information about the ABCD model is available at www.northwestern.edu/IPR/abcd.html.

How the ABCD Process Was Applied in Chicago Wilderness

The community based work group steering committee included representatives from the Chicago Park District, the City of Chicago Department of the Environment, the Lake County Forest Preserves, the Indiana Dunes Environmental Learning Center, the Indiana Dunes National Lakeshore, the National Audubon Society and John G. Shedd Aquarium. To engage communities with biodiversity conservation in their areas, the steering committee took the following steps:

1. Selected four focus regions and matched region to resource
2. Introduced ABCD to the Chicago Wilderness network through an ABCD Expo
3. Brought the four selected regions into the ABCD process through community meetings
4. Held a second ABCD Expo in order to update CW member organizations and community members on the status of projects in the communities, and to share lessons learned so far

1. Matching Region to Resource

The steering committee met to identify a set of diverse geographic focus areas based on mutually agreed-upon criteria, such as areas that are environmentally under-served, urbanized, nearby natural areas, have potential for partnerships with Chicago Wilderness members, and have varying degrees of community involvement. They then matched those areas with Chicago Wilderness member environmental organizations who could lead the outreach effort in each area. The geographic focus areas selected and lead organizations are:

Focus Areas	*Lead Organizations*
Gary, Indiana	• Indiana Dunes Environmental Learning Center • Indiana Dunes National Lakeshore
Jackson and Washington Parks (south lakefront), Chicago, Illinois	• Chicago Park District • City of Chicago Department of Environment
Matteson, Illinois	• National Audubon Society
Waukegan and North Chicago	• Lake County Forest Preserve • John G. Shedd Aquarium

2. The ABCD Expo

Working with the Asset Based Community Development staff, the steering committee developed a plan for introducing ABCD to the Chicago Wilderness network. The plan began with the ABCD Expo: Get Involved! Discovering Your Community. Over 50 Chicago Wilderness members attended the ABCD Expo at the South Shore Cultural Center in Chicago. A diverse mix of participants came from suburban and urban locations in Illinois and Indiana and many had not previously attended a Chicago Wilderness event.

During the workshop, participants discovered the resources that would help them carry out their environmental work, discussed building on assets through identifying current resources, developed tools for recruitment of community members and environmental activists to participate in the planning process, and mapped assets in each of the four geographic focus areas.

As the workshop progressed, participants identified and incorporated the "five asset categories" into their discussion:

Asset Categories	*Potential Assets*
Individuals	Skills, work experience, knowledge, culture, teaching ability, volunteer experience, life experience, technical know-how, hobbies.
Associations	Group energy, membership, knowledge based group skills, professional and technical know-how, group trust, financial support, information, clout.
Institutions	Including facilities, employees, volunteers, financial resources, expertise, local power, political voice, equipment, purchasing power.
Physical Environment	Including land, buildings, bodies of water, infrastructure such as transportation systems, roads, utilities, airports.
Local Economy	Locally owned businesses, jobs, personal income, employment opportunities, entrepreneurs.

This workshop familiarized CW members with the ABCD process and equipped them to begin working with the four selected communities on mapping their assets and mobilizing around biodiversity conservation opportunities.

3. Incorporating Communities into the ABCD Process
Chicago Wilderness members were excited after the success of the first ABCD workshop and with the support and leadership of the community based steering committee, were eager to broaden the foundation of people to support Chicago Wilderness work in greater depth.

Community meetings were held in Waukegan, Matteson, Chicago and Gary, facilitated by ABCD Institute staff in conjunction with the CW project steering committee. The focus of the meetings was to evaluate and document environmental and organizational assets in each targeted community.

Based on the results of these community meetings, Chicago Wilderness and community members planned events and strategies geared toward fostering biodiversity-focused neighborhood and community based programs for the coming year. A number of great programs emerged, as illustrated below.

Waukegan and North Chicago, Illinois
In Waukegan and North Chicago, Lake County Forest Preserves is working with the community on:
- Continuation of an annual earth day event with the goal of increasing support and interest from the Waukegan community
- Creation of a partnership program with the park district and the center for the arts to bring Lake County Forest Preserves programs to kids in an environment where they are comfortable, with the intent that they will foster a desire for kids to come out into natural areas and participate in programs the district currently offers

Matteson, Illinois
In Matteson, Audubon of the Chicago Region is working with the community on exploring several ideas for involving the community with restoration at the 350-acre Bartel Grassland, including:
- Holding outdoor worship services
- Developing a community group adopt-a-plot program
- Planning events at Bartel with and for an expanded group of community volunteers
- Helping the Village of Matteson to develop a display board, brochure or web site to highlight Matteson's natural diversity

Gary, Indiana
In Gary, the Indiana Dunes National Lakeshore and the Indiana Dunes Environmental Learning Center worked with Gary's Community Partnership Group to plan an event for the spring of 2003.
- "Green Gary" was a kick-off event that highlighted natural spaces and encour aged participants to explore natural spaces in Gary. The event took place in Marquette Park , with four major center stage activities and an expo area to highlight local organizations and their relationship to the environment.

The Chicago Park District's Nature Oasis Program brings day campers to Jackson Park for a bird walk.

Jackson Park, Chicago, Illinois
In Jackson Park, the Chicago Park District worked with the community to develop ideas about a number of ways to connect local associations with natural spaces at the park, including:

- Volunteer docents leading park tours
- Bring schools on nature walks in the parks
- Develop partnerships with museums and universities
- Create service learning opportunities in the park
- A special event for community schools and scout troupes that includes hands-on science activities and service learning opportunities.

4. The ABCD Expo: Take II
To update the member organizations on the status of the projects in the communities (and because of the positive response of participants after the first ABCD Expo and their interest in continuing to develop skills and resources when working with communities) the steering committee planned ABCD Expo: Take II. Invited to the meetings were Chicago Wilderness organizations and interested community members.

The ABCD Expo: Take II workshop began with an overview of the developing relationship between communities, green spaces and environmental organizations in each of the four geographic regions. A steering committee and community member representing each region informally presented answers questions such as What is success?, What assets are mobilized to achieve that success?, What are the challenges? How are you capitalizing on success?

After the presentations, an activity was designed so that participants could model the sometimes confusing, yet energizing process of building community relationships. The participants were divided into three groups, each of which would discuss one of the following topics: Challenges, Solutions and Community Assets. The Challenges group wrote down on a sheet of paper a challenge that several members of that group had in common while working with communities. They literally balled up the piece of paper and tossed the challenge across the room to the Solutions group. The Solutions group discussed possible solutions to the challenge, reached a consensus then wrote down the solution on the same crumpled piece of paper. The Solutions group threw the paper to the Community Asset group. The Community Asset group identified assets that could be mobilized to solve the challenge using the solution the other group had generated.

The workshop allowed participants the opportunity to experience in a more tangible way the complex nature of

community partnerships as well as the built in successes of the ABCD model (and how that model feels in action).

In addition to the presentations and break-out session, the organizers of the ABCD Expo: Take II incorporated several features to make the meeting appealing to community members in attendance, such as a continental breakfast, children's activities during the meeting, and a free field trip to Shedd Aquarium after the meeting.

"Balls of paper and creative idea were flying across the room. There was solace in discovering that some challenges aren't unique. There was also joy in discovering solutions to challenges and a variety of ways to implement those solutions all while building community trust and furthering relationships."

Workshop participant, ABCD Expo: Take II

Lessons Learned

Going forward, each of the Chicago Wilderness members working in these four communities now has a broad network of community folks to work with as they pursue their biodiversity conservation goals in the region. The CW members are excited about these new relationships and are committed to continue incorporating the ideas and direction outlined by folks living in the community.

The CW members working on this project gained many valuable tools, both from the ABCD framework and from the various interactions with their partner communities. The members involved in this work highly recommend the ABCD model for any Chicago Wilderness member interested in finding effective ways to engage communities. For more information about this model, contact Peggy Stewart (contact info at the end of this article) or visit the ABCD web site at www.northwestern.edu/IPR/abcd.html.

In addition to the tools available from the Asset Based Community Development Institute, a long list of tips for helping to introduce and ensure successful community engagement was generated based on CW members' experiences in the communities. For a copy of this list, please contact Peggy Stewart.

Community outreach using the ABCD model can be as easy - and as complex - as listening to community members express their values and working with them to discover the connections between those values and the often unnoticed treasures of the natural areas surrounding them. One resident noted at a community meeting how he had often pined for the meadowlarks he came to know in his childhood on a farm—little realizing that these same meadowlarks were singing just a few blocks from his house. Making this richness more visible will create a great source of energy and enthusiasm for local Chicago Wilderness work.

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The Correspondence of Soil Series and Native Plant Communities in the Natural Areas of McHenry County, Illinois

Thomas B. Simpson, New Academy for Nature and Culture and Mary J. Zaander, Witness Tree Native Landscapes

Do soil survey maps provide reliable information about historic plant communities? Can soil differences help guide the development of restoration goals? This article explores these questions and discusses the informative patterns that can emerge from soil surveys.

Introduction

Ecosystem restoration requires an understanding of the pre-European-American settlement plant community. On sites where a high-quality remnant community is present, land managers can utilize existing conditions to shape the restoration goals. When, as is most often the case in Northeastern Illinois, the native plant community has been altered or destroyed, managers must use other indicators of the pre-European-American historic landscape.

Interrelationships of soil and vegetation are "recorded" in the soil profile. Studying the association of soil characteristics and plant communities in situations where the soil and communities are relatively undisturbed should help ecologists make more accurate inferences about pre-European-American settlement plant communities, particularly when these communities are absent or have been altered.

The fundamental purpose of the soil survey is to "show the geographic distribution of soils and to make predictions about the soils" (USDA, 1999). Classification systems are important in communicating about, studying, conserving and/or utilizing both soils and vegetation. Soil series, the most specific classification level, have been used by the USDA's Natural Resources Conservation Service (NRCS) for many decades to classify and map soil. Restorationists often use soil surveys as one tool to assist them in making decisions about restoration activities, in particular to characterize the pre-European-American settlement plant communities of a site. The basic question we sought to answer in our study is whether soil survey maps provide reliable information about historic plant communities. We also wanted to describe how soil differed among plant communities in order to evaluate the potential value of soil description and mapping as a guide to defining goals for restoration projects.

A Soil Primer

Because many non-experts will read this article, we include here a brief primer on soils in order to introduce the reader to the necessary terminology.

Soil scientists recognize and describe soil horizons (horizontal layers) in the field on the basis of observable soil properties. These properties include texture—the proportion of sand, silt, and clay in the soil; structure—the manner in which the soil particles are aggregated into clods or peds; pH—the acidity or alkalinity of the soil; and *organic matter content* (expressed as a percentage of the dry weight of the soil).

If you had visited the Chicago area 14,000 years ago and examined the soil only a few centuries after the glacier left, the first change you would have noticed as soil began to form from the glacial sediment or parent material would have been the accumulation of plant debris on and in the surface soil. The surface organic litter we call the O horizon, and the underlying zone where humus accumulates and mixes with mineral (nonliving crystals) material we call the A horizon, or topsoil. The humus content of the A horizon results from the balance of two processes: addition by the plant community and decomposition by soil microbes, which metabolize organic material, releasing the carbon in the form of carbon dioxide. The rate of decomposition depends mostly on the availability of oxygen, which is needed by soil microbes to consume the organic matter. Because oxygen must diffuse into soil from the atmosphere, when a soil is saturated with water, the pathway of oxygen diffusion is cut off and decomposition slows down dramatically.

Though appearing to be static, soil is in constant motion internally. Plant roots push through soil and create gaps and tunnels that collapse when the roots die and decompose. Burrowing animals, especially soil arthropods and worms, move great masses of material each year. Physical processes also cause the soil to move. Tiny soil particles such as clay move downward as rain percolates down through the soil. Such leaching produces two characteristic soil horizons: the E horizon, which is impoverished in clay and usually forms within 5-20 cm of the surface; and the underlying B horizon, which is enriched in clay and may reach to a depth of more than a meter. Lime, an abundant component of the glacial material of our area, is dissolved in soil water and also leaches downward. This makes upper soil horizons more acid (lowering the pH) and lower soil horizons more alkaline (raising the pH).

Iron is a relatively small component of soil, but it is an important coloring agent. The ratio in which iron and oxygen combine in the soil changes the color of the resulting iron compounds. Soil scientists use soil color to assess seasonal wetness. In seasonally saturated soil the color of the lower soil zones is usually gray or grayish brown, whereas in the soils that are only rarely saturated with water, the lower soil zones are usually yellow-brown and orange-brown in color. This seasonal wetness of a soil is described by placing it in a drainage class: well drained; moderately well drained; somewhat poorly drained; poorly drained; and very poorly drained

Methods

We selected study sites in order to include a wide variety of remnant ecosystems in McHenry County. In wooded areas, we judged whether a plant community was a remnant by the presence of large specimens of tree species—usually oaks or sugar maple—known to be present at the time of settlement. For grassland and wetland sites, we looked for a predominance of conservative plant species—those known to be sensitive to disturbance. We selected sample plot locations within each study site in an attempt to include a wide variety of soil series as mapped by the NRCS soil survey. At each study site, we located plots randomly within areas of uniform plant community and topography.

At each sample site we collected the following information: location within the study site; landform; topographic position; slope steepness; aspect of the slope; and soil series as mapped by the NRCS (the most specific unit in the soil classification). Soil properties noted in the field included: thickness of horizons; color; texture; structure; abundance of rock; and drainage class. We collected soil samples for laboratory analysis at 5-10 cm (A horizon), 25 cm (E horizon, if present), and 50 cm (B horizon). We then analyzed samples for soil texture (the proportion of the mineral particles in the sand, silt, and clay size class), soil pH (acidity and alkalinity), and organic matter (humus) content of the A horizon. In addition, we sampled trees, shrubs and ground flora in order to classify each site according to the Chicago Wilderness community classification system (CWCC).

Results

Correspondence of Soil Types and Chicago Wilderness Natural Communities

Altogether we established 140 sample plots in 24 natural communities. Sixty-two of the plots (44%) were within wooded (forest, woodland or savanna) communities. Two were in shrubland communities (1%). Twenty-seven were in prairie community types, and 49 were in wetland areas.

We could assign 136 of the 140 samples to a soil series based on maps in the 1997 McHenry County Soil Survey. Strikingly, we found little correlation between soil series and community type. Altogether, there were 28 soil series represented by at least one of the 136 plots, but we found as many as nine community types on soils of the same series—an average of 2.7 community types per series—and the non-correlation worked both ways. Under each community type, we found an average of three soil series. Not surprisingly, plant community type could not be predicted reliably from the mapped soil series. The official soil description by the NRCS usually lists the general category of native vegetation type associated with each soil series. If one assumes that the NRCS "forest" vegetation class includes the CWCC classes of forest, woodland, savanna, and shrubland, then the NRCS vegetation classes were accurate 94 out of the 100 sample plots for which the type was exclusively stated (94%). More of a problem are those soil series that do not state a native vegetation or that mention more than one vegetation type.

Of the 28 samples in prairie communities, 13 occurred on soil series that do not mention prairie or grasses but do use the term forest along with cultural uses such as woodlots, crops, or pasture. Only five of the 63 samples of wooded community types occurred with soil whose Official Soil Description (OSD) did not mention forest or trees, but 23 occur on soil series that mention forest along with grasses or cultural land uses. So the soil survey in McHenry County can predict vegetation type at the most general level if one uses it carefully, but is of little use in differentiating a savanna from a forest, or a fen from a marsh or bog.

Soil Characteristics of Chicago Wilderness Natural Communities

Despite the fact that sample sizes for certain of the CW community types are small, many soil-vegetation relationships and trends are apparent in the data.

The thickness of the A horizon is related most closely to the wetness class of the plant community, the physiognomy (general appearance) of the plant community, and the soil parent material. In upland plant communities, the average thickness of

the A horizon tends to increase with an increase in soil moisture within similar community types and parent materials. However, the average thickness of the A horizon for plant communities with wet moisture regimes varies little with changes in community physiognomy. The average thickness of the A horizon for Wet Fine Texture Prairie, Wet Mesic Fine Texture Savanna, and the Wet Mesic Upland Forest are about the same, at approximately 30 cm. Organic matter content of the A horizon tends to be greater in wetter plant community types than in drier types, and greater in prairie community types than in wooded types. Wooded community types generally have more acidic soils than do prairie community types. The leaves of grasses contain greater amounts of calcium than do oak leaves, and this additional cycling of calcium to the surface maintains higher pH values in soils of grasslands as opposed to oak woods. In general, soils of woodland community types show a greater difference in pH between the A and B horizons than do the soils of prairie community types due to more extensive leaching. On average, the pH of the B horizon was 0.20 units higher than the A for prairie samples and 0.46 units higher for wooded samples.

Discussion and Conclusions

Overall, our results indicate that soil series as mapped by the NRCS have little value as indicators of historic plant community type. NRCS soil mapping in McHenry County appears to be adequate to make general decisions concerning whether a site had a wooded (forest, woodland, savanna) or grassland community, or whether the site is upland or wetland. However, where site-specific decisions are required regarding structural or compositional variation within wooded communities, or detailed interpretations of variation within prairie or wetland community types, more exact information about the soil and site in question is needed. Information describing soil characteristics—such as the depth of the A horizon, presence or absence of an E horizon, soil pH, and the amount of organic matter in the A horizon—can be used in the context of other site data (such as slope, aspect, landform and estimated fire frequency and intensity) to make inferences about specific plant communities.

Beyond inferring the presence or absence of trees or the difference between uplands and wetlands, the NRCS soil survey should not be relied on to estimate pre-European settlement vegetation types in McHenry County. Even these distinctions should be made with care, because reliably differentiating wooded from prairie from wetland vegetation is possible only for those series whose OSD states a single native vegetation type. This is not a criticism of the soil survey, because the categorization of pre-European settlement vegetation type is not a stated goal of the NRCS soil survey. It is a warning about how the survey can be misused. On the other hand, both this report and Simpson and Rey (2000) indicate that plant community types as conceived within the Cook County classification (Thomas, 1998) or the Chicago Wilderness classification are associated with certain soil properties, indicating that a careful onsite analysis of soil properties can help to refine our understanding of pre-European American community type.

Soil is an important component of ecosystems and understanding soil can help the restorationist decide what are and are not appropriate plant community models to guide restoration. Onsite surveys of soil should become as routine a part of restoration as onsite surveys of vegetation. Whether one seeks to confirm a proposed

change in community type or to check a soil map for serious error, basic skills in soil description will often suffice. These skills could easily be learned by most managers and should include the ability to note changes in A-horizon thickness and color, describe the presence of mottling / gleying, or note the presence or absence of an E horizon. The most common mistake made in soil interpretation is to stand over a single soil core and speculate what it means. Instead, one should collect a spatial or transect sample and compare changes in soil properties along the transect to changes in vegetation—both the actual vegetation and the inferred pre-European-American settlement vegetation. When this is done properly informative patterns always emerge. Managers or site stewards can learn to answer many of their own questions, or determine when they need the services of an expert.

This study was completed in 2001, and was funded by grant money from Chicago Wilderness, McHenry County Conservation District and Northeastern Illinois University.

The senior author was Assistant Professor in the Department of Geography and Environmental Studies at Northeastern Illinois University (G&ES at NEIU) at the time the study was completed. He is now Ecologist with the New Academy for Nature and Culture. The junior author was a graduate student with G&ES at NEIU at the time of the study. She now is co-owner of Witness Tree Native Landscapes. For questions about this article, please contact Tom Simpson at tsimp@earthlink.net.

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Preliminary Findings on the Impact of Prescribed Burning on Prairie Spiders

Frank Pascoe
University of St. Francis

Managed burns are beneficial for native prairie plants, but what is the impact of prescribed burning on prairie invertebrates? For this study, twelve prairies were sampled in 2000 and 2001, with results suggesting that prescription burning has no impact on salticid species abundance and richness after the initial decrease seen the summer after a cold-season burn.

Objectives and Methods

This study reports on the first two years of a multiyear investigation of the impact of prescribed burning on prairie spiders. This initial analysis is focused on one family of spiders, the Salticidae (jumping spiders) because they are the family with both the greatest numbers and diversity in the region's prairies (Figure 1).

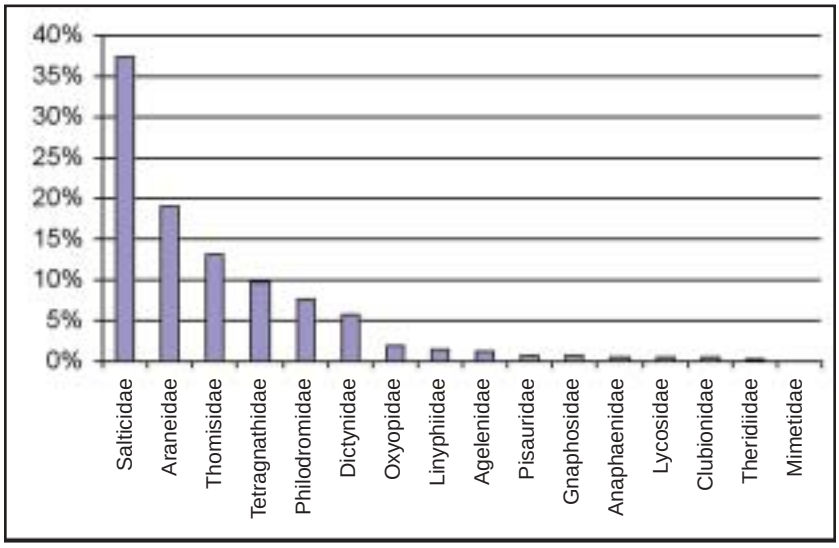

Figure 1. Spider families and relative percentage of total spiders collected at all prairies (June and July, 2001). This pattern of salticid dominance in seen in both burned and unburned prairies; there is no significant difference in family richness (ANOVA; p=0.89) or abundance (ANOVA; p=0.44) when prairies are compared by burn history.

The *Chicago Wilderness Biodiversity Recovery Plan* discusses several steps and recommendations addressing the need for improving the scientific basis of ecological management. Information about the impact of fire on flora and fauna is critical to making good decisions when burning natural areas. While there is some information available about the impact of fire on some insects (Panzer, R. 1999) and other animals (Packard and Mutel 1997), almost nothing is known about the effect of periodic management burns on arachnids. The few previous studies that examined the impact of prescribed burning on spiders have suffered from: observations limited to one year (e.g. Haskins and Shaddy 1986, Usher and

Smart 1988, Nicolai 1991); observations limited to one site (e.g. Haskins and Shaddy 1986, Usher and Smart 1988); spider taxa not identified (e.g. Nicolai 1991); spider survival only noted for specific microhabitats (e.g. "under bark") (e.g. Nicolai 1991); observation of only the ground spider fauna, ignoring the plant inhabiting groups (e.g. Usher and Smart 1988, Haskins and Shaddy 1986).

The *Biodiversity Recovery Plan* specifically identifies the lack of scientific data regarding such ecological processes such as predation and fire. The initial-impact phase from a burn may be the most important because population changes may significantly influence species interactions such as predator-prey relationships (Reed 1997). If fire alters predator populations and their prey populations, it may have a significant effect on management of natural areas for sensitive species of insects (e.g. Lepidoptera and leafhoppers). Especially significant, but not well studied, may be the effect of predator density and diversity on prey biodiversity (Spiller and Schoener 1998). In addition, priority effects may be important in determining the length of the recovery phase for the spider population (Ehmann and MacMahon 1996).

This multi-year study is investigating the impact of prescription burning on prairie spiders, in replicated, diverse prairie types, under different burn regimes. This study addresses the following questions: 1) Are there any differences in spider species richness and abundance when the prairies are compared by prairie type, size, "YSLB" - years since last burn, or burn history (years on burn regime) and 2) Are there spiders that could be considered burn sensitive species and therefore might require special consideration in a burn management plan?

With the help of undergraduate students from the University of St. Francis, 12 prairies (total of 21 burn units) were sampled with sweep nets during both June and July 2000 and 2001. Three 200 meter transects were sampled at each burn unit each month. The prairies were chosen to represent a diversity of prairie types (sand, black soil, wet, etc.) and size, as well as burn history. The prairies were all located in Will, Kankakee and Grundy counties.

Results

Overall, spider populations were significantly greater in 2001 than in 2000; the total number of all spiders collected in 2000 was 4237, while the total for 2001 was 6426. Doug Taron (2002) noted that for northeastern Illinois, 2001 was the most "remarkable season in the history of the Butterfly Monitoring Network." He suggests that factors such as a mild winter or decrease predator / parasite populations due to low butterfly populations in 2000 might account for the dramatic rise in 2002. Increased spider populations may be due to similar factors: increased prey in 2001, decreased parasite populations, and / or mild weather.

When the total number of salticid species, or species richness, was compared between prairie types, burn unit size, and years since last burn, there were no significant differences that could not be explained by the overall greater abundance of spiders, or number of individuals present in the prairies, in 2001. Three prairie burn units in this study were burned between summer 2000 and summer 2001. All prescribed burns for this study were cold season burns carried out in either the fall (October-November) or spring (March-April). When these three prairie burn units

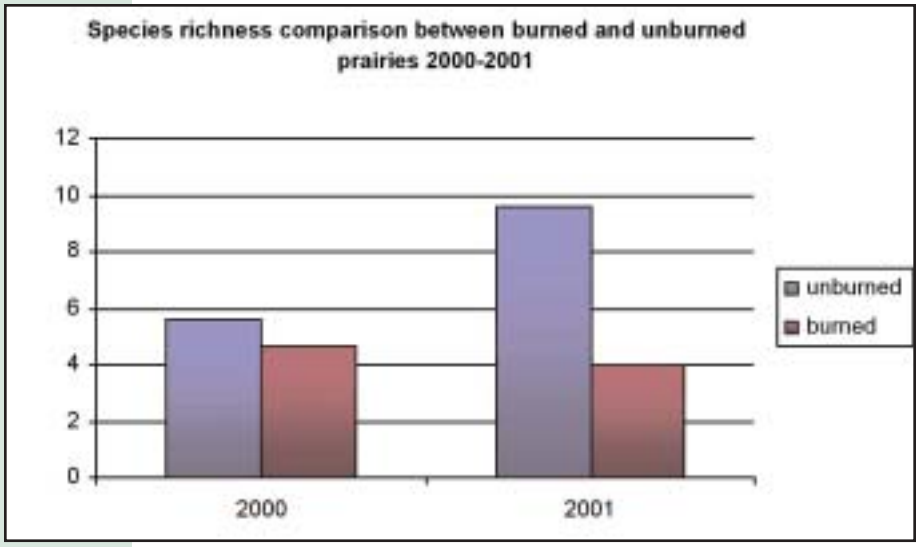

Figure 2. Comparison of salticid richness between three prairie burn units that underwent cold season prescription burns between summer 2000 and summer 2001 and five burn units that had not been burned for at least five years. The average change for the unburned prairies was + 4 species while the average change in species for the burned prairies was – 0.67. The difference in richness between the burned and unburned prairies is significant (t-test; p=0.003).

were compared with five other prairies that had not been burned for at least five years, I found a significant difference between salticid abundance (not shown) and richness (Figure 2).

Examination of the specific salticid species found before and after the burns shows the following trends:

- The three most common species overall (*Phidippus clarus* Keyserling, 1885, *Pelegrina galathea* (Walckenaer, 1837), and *Marpissa pikei* (Peckhams, 1888)) were found in all three prairies both before and after the burn.
- In all seven cases where species disappeared after the burn, the species were considered rare (<10 adults collected in 2000).
- In all four cases where a species appeared after a burn, the species were also considered rare. Two of them, *Phidippus pius* and *Tutelina formicaria*, are considered very rare based on collections from previous years.

Noteworthy salticid species

Possible fire-sensitive species: *Sitticus concolor* (Banks, 1895) Although this species was not present at all unburned sites in 2000, 7 specimens were found at two non-burn sites, none were found at any prairie with a prescribed burn cycle. In 2001, it was again only found at a non-burn site.

Rare species: The Salticid species listed below are noteworthy for their scarcity in Illinois and surrounding states. None appear to be fire-sensitive and in fact most of the few individuals of each species collected have been found in prairies that are burned.

Marpissa grata (Gertsch, 1936)
Marpissa formosa (Banks, 1892)
Phidippus pius (Scheffer, 1905)
Sassacus papenhoei (Peckhams, 1895)
Tutelina formicaria (Emerton, 1891)

Salticid species unique to a single prairie: The only salticid species that has been collected both in 2000 and 2001 at a single site is *Pelegrina insignis* (Banks, 1892) at Grant Creek prairie. This is the only site that we have found this species in any

collection in the Will County area. Northeastern Illinois is probably the northeastern most edge of this species range. A presumed competitor, *Pelegrina galathea* (Walckenaer, 1837), is the most common *Pelegrina* in this Northeastern Illinois prairies and has been found in all prairies sampled, including Grant Creek.

Conclusions

The overall increase in spider populations in 2001 made the decrease in abundance and species richness for salticids in burned prairies even more surprising. While additional years of study are required to confirm and expand on this result, it is a clear indication that for at least one year after a burn at three prairies, prescription burns decreased the abundance and species richness of jumping spiders.

Somewhat paradoxically, it was observed that there was no significant difference in salticid species richness during the first year (2000) between prairies with a history of prescription burns and those not burned. A factor that could not be controlled for in a single year is that most of the prairies that were in their first or second burn cycle were recently planted prairie restorations. New prairies may have a different response to fire than more established prairies

In addition, we found that several new, and even rare, species appeared in the burned prairies. One possibility is that after the initial year of decreased numbers, additional prey due to fire-stimulated plant growth and spider "diffusion" from surrounding areas brings the spider populations back to pre-burn status during the second or third year.

Therefore, the results suggest that prescription burning has no impact on salticid species abundance and richness after the initial decrease seen the summer after a cold-season burn. This will be confirmed if the prairies where the salticid abundance and richness decreased in 2001 show a rebound when the data for 2002 are analyzed.

Implications

Since none of the sites in our study burned the entire prairie, these results also seem to support the practice of burning only a section of the prairie at one time. What happens when an entire prairie is burned will be investigated over the next two years at one of our sites that received a total burn including surrounding areas. We also hope to examine the method by which spiders "reappear" in burned prairies. Do they "balloon" in from surrounding prairies? Do they slowly migrate or "diffuse" in from adjacent unburned sections? Or, do they simply survive the fire under debris or in unburned patches and emerge to repopulate the prairie after the fire?

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Tracking Down Rare Plants: Plants of Concern Program Brings Together Volunteers, Agencies, Landowners & Scientists

Susanne Masi
Chicago Botanic Garden

After three years in the field, the Plants of Concern monitoring program is beginning to see solid and positive results. Levels of participation and numbers of popoulations monitored are high, new populations of rare plants have been discovered, and valuable new information about these plants has been gathered.

Background

Plants of Concern (POC) is a monitoring program for rare plants in Northeast Illinois that uses trained volunteers to gather standardized, regional monitoring data over time to determine plant population response to management practices. POC activities include: (1) monitoring rare plants using standardized protocols; (2) gathering and analyzing data on plant populations; (3) creating a regional rare plant monitoring database; and (4) providing land managers with feedback to evaluate management practices for specific plant populations.

Key elements of the POC program include broad-based collaboration of landowners, land managers and scientists, and training of volunteers as citizen scientists through course work, workshops, and in-field mentoring. Reports are submitted to the Illinois Natural Heritage Database, the state repository of listed species information.

POC is coordinated through the Chicago Botanic Garden, but its strength within Chicago Wilderness is that it is a true partnership involving active participation by 120 volunteers and more than 45 landowners, including many public agencies, conservation organizations, and private landowners. Audubons Chicago Region's Habitat Project and The Nature Conservancy's Volunteer Stewardship Network have provided key support.

POC Program History

POC was launched in 2000 by an Advisory Group representing Illinois public agencies in Chicago Wilderness, scientific organizations, and volunteer groups. Discussions held several years previously among Chicago Wilderness members developing the *Biodiversity Recovery Plan* indicated a need for standardized monitoring in the region – both at the community and species level. The monitoring envisioned would supplement work already in place within individual agencies and scientific community. The monitoring would describe regional trends for the rarest plants and natural communities that contribute to the biodiversity of the region as a whole.

"Having a hand in conservation efforts has been a life-long goal of mine. And I'm impressed by how generally knowledgeable the population of stewards and naturalists is. It's fun being a part of Plants of Concern! And it's easy to be enthusiastic when you are surrounded by so much beauty."

Kathleen Garness, Plants of Concern Volunteer

In addition, a week-long intensive monitoring workshop, led by a specialized Nature Conservancy team and funded by Chicago Wilderness, was held at the Indiana Dunes National Lakeshore in 1999. In this workshop, agency staff and volunteers explored regional monitoring issues and discussed monitoring protocols that would provide feedback to land managers on the effects of management strategies on populations of rare plants and plant communities.

POC was a direct outcome of the multi-year discussion on monitoring needs, and the workshop. It was clear that trained volunteers would be needed to help agencies and other landowners carry out the daunting task of regularly monitoring the more than 800 occurrences of listed species that comprise our rarest elements of plant diversity. Chicago Wilderness has funded POC since 2001, and the program has just completed its third year of monitoring.

Volunteers

POC is a complex program involving many players, but volunteers form the hub. These enthusiastic plant lovers, who are at the same time serious, trained citizen scientists, work throughout Northeastern Illinois on monitoring and other POC activities.

Volunteers are recruited in various ways, but are directed to POC for training and coordination. POC staff work with each landowner to assign volunteers to specific sites and species. Permits are issued to volunteers who work in nature preserves as well as on most forest preserve sites. All volunteers are asked to sign a confidentiality form in which they agree not to reveal rare plant locations to anyone but program and landowner staff.

Volunteers do not have to be expert field botanists, but must be willing to learn their assigned species, common associate species and key invasive plants. In fact, a large percentage of POC volunteers come to the program with stewardship experience, and a good knowledge of local flora. Less knowledgeable volunteers are usually paired with experienced monitors. Based on direct field experience with volunteers, POC feels confident that the data provided by these citizen scientists is complete and accurate. To confirm this, in 2004 we plan to implement a pilot study to validate the quality of volunteer data.

"This important program has provided the opportunity to gather professional biologists as well as knowledgeable, dedicated volunteers in a focused effort to understand the ecology of these imperiled organisms."

Leslie Berns, Natural Resource Supervisor, Forest Preserve District of DuPage County.

Methods: Monitoring Activities

Two monitoring protocols are currently in use by POC. Most POC volunteers conduct Level 1 monitoring. Level l monitoring involves one or two site visits per population to census (count and measure) populations, map them and take GPS coordinates, record threats to the population and observable management activities. Land managers submit a separate standardized form for each population monitored to provide historical and current information on management techniques implemented specifically in the population area.

Level 2 monitoring is more intensive than Level 1 monitoring, requiring increased time and training on the part of the volunteers. Most Level 2 monitors have taken the intensive course "*Principles and Techniques of Plant Population Monitoring*" offered at the Chicago Botanic Garden. Volunteers doing Level 2 monitoring work very closely with POC staff and agency staff. Level 2 monitoring focuses on four rare species selected by the Advisory Group, Hill's thistle *(Cirsium hillii)*, white lady slipper *(Cypripedium candidum)*, eared false foxglove *(Tomanthera auriculata)*, and dog violet *(Viola conspersa)*, at 5-10 locations for each species. Monitoring involves "demographic" studies of populations in which individual plants (~ 100 per plot) are permanently tagged, and for which plant-specific data is collected from year to year to learn about life history and population viability as well as management impacts.

Results: Long-term Trends and Front-line Watchdogs

After three years in the field, POC is beginning to see solid and positive results. Levels of participation and numbers of populations monitored attest to the success of the program in drawing both volunteers and landowners together to meet the monitoring needs articulated by Chicago Wilderness.

Working with an advisory group of approximately 15 land managers, scientists and volunteers, POC tracked the status of 81 Illinois rare, threatened, and endangered plants at more than 90 sites and natural areas, as of 2002. POC volunteers help evaluate the health of plant populations and their response to management activities. POC now monitors more than 20% of the occurrences of listed species in Northeast Illinois. The ultimate goal is to monitor up to 75% of the region's occurrences.

Monitoring is by definition a long-term process. Only after additional years of data collection will statistical analysis reveal any real change to populations in response to management activities. However, POC is already generating short-

"For me, POC monitoring and stewardship at Montrose is as much a spiritual endeavor as a scientific or research one. Observing and quantifying the E/T plants and every-thing that surrounds them gives me a unique opportunity to be… close to Nature…."

Leslie Berns, Plants of Concern Lakefront Volunteer

term benefits to land managers as a result of observations made by monitors. For example:

- Volunteers, in their searches for previously recorded species' occurrences, have relocated populations that have not been reported on for many years. In quite a few cases, monitors have found new locations for their assigned species by conducting a thorough search in appropriate habitats at their sites. This kind of dedicated and time-consuming search, feasible for a monitor who is assigned one or a few species, would not be possible for most land managers to conduct for all of their rare species.
- Level l analysis indicates that approximately 75% of all populations monitored are impacted by one or more invasive species. The analysis indicates that 80% of the populations are impacted by brush encroachment. This information can help the land manager to focus efforts on brush and invasive plant control in areas where the populations of the rarest plants occur. In doing so, they also benefit the communities these plants inhabit.
- A POC Chicago lakefront volunteer monitors three listed species at her site and for many years has actively stewarded the area as habitat for both birds and native plants. This monitor has met with the Chicago Park District's Natural Areas Department and other experts to provide advice on such issues as invasive species removal, protective fencing, dog exclusion, and others. In addition, the Natural Areas Department is managing several Chicago lakefront sites by allowing them to undergo a natural dune formation on which several rare plants have appeared which are now being monitored through POC.
- Monitors have also alerted managers to more imminent threats to populations. In one instance, a public preserve staff person inadvertently mowed through a population of eared false foxglove before its seed could be disbursed. Because eared false foxglove is an annual plant, loss of seed in any given year can be a serious threat to population survival. When notified by the monitors, the landowner took steps to prevent any future mowing during this critical period in the species' life cycle. In another case, a volunteer monitoring white lady slipper and a County Conservation District Ecologist observed that a significant level of poaching of this beautiful orchid had occurred. They notified the Conservation District police and asked them to increase policing of the area.
- Level 2 monitoring has already given us important information about the species being monitored. For example, monitors have documented that Hill's thistle does not always behave,

as commonly believed, as a monocarpic perennial (a plant that dies after flowering at the end of several years of vegetative growth). POC has recorded thistle plants blooming two years in sequence as well as to set forth new vegetative growth after blooming. In monitoring dog violet, volunteers have documented a strong negative relationship between plant size and floral production with invasive canopy cover. The two sites with a high prevalence of European buckthorn *(Rhamnus cathartica)* showed depressed overall plant size and flower production in contrast to those in more open sites.

The Future

POC plans to link their database with other Chicago Wilderness monitoring and scientific databases. There is especially strong potential for GIS (Geographic Information System) applications of POC data, based on the GPS coordinates taken by monitors. For example, it will be possible to project a regional geographic distribution of rare plants in relation to plant communities, management activities, soils, nearby land use, etc.

POC has a strong potential to serve as a model for monitoring other regional rare plant diversity within a management context. In fact, the Denver Botanical Garden has developed a regional orchid monitoring project based directly on POC. In time, and with funding, POC plans to publish a monitoring manual that can be used by both POC participants as well as by other groups.

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And When They Got Together… Impacts of Eurasian Earthworm and Invasive Shrubs on Chicago Woodland Ecosystems

Liam Heneghan
DePaul University

Are earthworms and European buckthorn working together to negatively impact our woodland forest floors? This study shows that these organisms develop a synergistic relationship that has a negative effect on woodland leaf litter, thus jeopardizing the invertebrate populations that reside there and the foodweb they support.

Introduction

Invasive species are implicated as major stressors of the ecosystems that they invade. Generally, they are regarded as second only to habitat loss as a factor involved in modern human-caused extinctions (Soulé, 1990). Of necessity, much research has focused on the impacts of individual species on the invaded ecological communities. However, there is a growing appreciation of a need to investigate synergy between invaders (where one species facilitates the spread of another typically unrelated species), and furthermore to explore the impact of these species on important ecosystem processes (such as decomposition, nutrient cycling). For instance, the activity of feral pigs in Hawaii's forested ecosystem appears to promote the successful invasion of invasive plants into these rapidly degrading ecosystems. Sticking with Hawaiian examples, the invasion of Myrica fava (fire tree) introduced a novel biological process to Hawaiian soils: symbiotic nitrogen fixation. The accumulation of nitrogen in these soils proved detrimental to natural plant communities that developed on soils that were historically relatively lower in nitrogen.

I report here on work being undertaken in woodlands in the Chicago area on the interaction between a major plant pest, Rhamnus cathartica, (European buckthorn) and Eurasian earthworms. The preliminary results of these studies indicate that invasive earthworms achieve their highest abundance and greatest biomass in woodland patches dominated by European buckthorn. Furthermore, an investigation of the impact of these earthworm populations revealed that they are responsible for a very rapid incorporation of forest floor material into the soil. When these studies are combined with those showing that loss of forest litter results in the collapse of invertebrate populations that reside there, the potential for broad mischief is great. This is because invertebrate populations residing the litter layer support a large woodland foodweb that includes mammals and birds.

Buckthorn Impacts on Forest Ecosystems

In recent years, I have been examining the impact of buckthorn on some ecosystem properties in woodlands in Chicago. The results indicate that buckthorn may modify some processes in the soils, and that the legacy of buckthorn may, in some circumstance, have implications for subsequent conservation management of these areas. For instance, the leaf litter of buckthorn is unusually high in nitrogen. Since nitrogen is a limiting nutrient for both terrestrial plant and microbial population, not surprisingly this litter decomposes rapidly – even in the absence of detritivores most buckthorn litter will disappear before it is replenished in autumn. Perhaps more dramatically, leaf litter (comprised of leaves from multiple species) in which buckthorn is a component decomposes more rapidly that it would in its absence, indicting that the presence of buckthorn accelerates the disappearance of the litter of other species (Heneghan et al 2002). Patches within woodlands where buckthorn prevails have soils with elevated nitrogen, higher pH, and higher water content compared with uninvaded parts of the woodland (Heneghan et al. in press). Since all of these soil properties are important to plant community development, the growth of buckthorn may retard the success of restoration subsequent to the removal of this species.

Invasive Earthworms Interactions with European Buckthorn

Problems associated with Eurasian earthworms in Midwestern ecosystems have been receiving some attention recently (Wall Street Journal, National Public Radio http://www.npr.org/features/feature.php?wfId=1417427). Much of the forested ecosystems of the region developed in the absence of earthworms. Native earthworm populations did not survive Pleistocene glaciations. Most of the earthworms presently in natural areas in the Midwest are therefore invasive European species. While there is a growing literature on the topic that confirms the potentially negative impacts of this invasion (Gundale, 2002), little has been published on the consequence for woodlands in Northeast Illinois of introducing these major ecosystem engineers (sensu, Lawton and Jones, 1995). A recent study conducted in Mary Mix McDonald Woods, Glencoe, Illinois, revealed that both abundance and biomass of earthworms was high especially in areas dominated by buckthorn (Steffen, unpublished 2002). Steffen also established that a gradient existed in that woodland with some areas being relatively worm-free, some areas hosting modest populations and finally, buckthorn thickets, where worm populations were highest both in terms of abundance and biomass.

We exploited this 'natural' gradient to establish a decomposition experiment to evaluate the potential effect of earthworm populations of varying density upon the breakdown of litter of varying substrate quality. As alluded to above, litter can vary in its quality as a resource for decomposers. Generally, when litter is high in available nitrogen, and is replete with simple sugars it is highly attractive to microbial decomposers (and subsequently to detritivores – ranging from protozoa to earthworms). The litters we employed in this experiment were buckthorn, *Acer saccharum* (sugar maple), *Quercus rubra* (red oak), and *Quercus alba* (white oak). At each of three areas in the woodland (low earthworms, medium earthworms, and high earthworms) mesh litterbags constructed in a manner that either permitted earthworm colonization or excluded earthworm were placed on the soil surface. Each bag contained 5 grams of litter. After three months the bags were collected and the remaining litter air-dried and weighed.

Earthworms Affect Litter Disappearance but not all Litter is Equally Attractive
The preliminary results of the experiment revealed that earthworms have a very dramatic impact on litter disappearance (Fig. 1). However, they have a clear order of substrate preference: buckthorn and sugar maple litter is greatly impacted, but the oaks are not. These results seem to explain the observation that in patches of the densest buckthorn the forest floor is without litter excepting scattered oak litter.

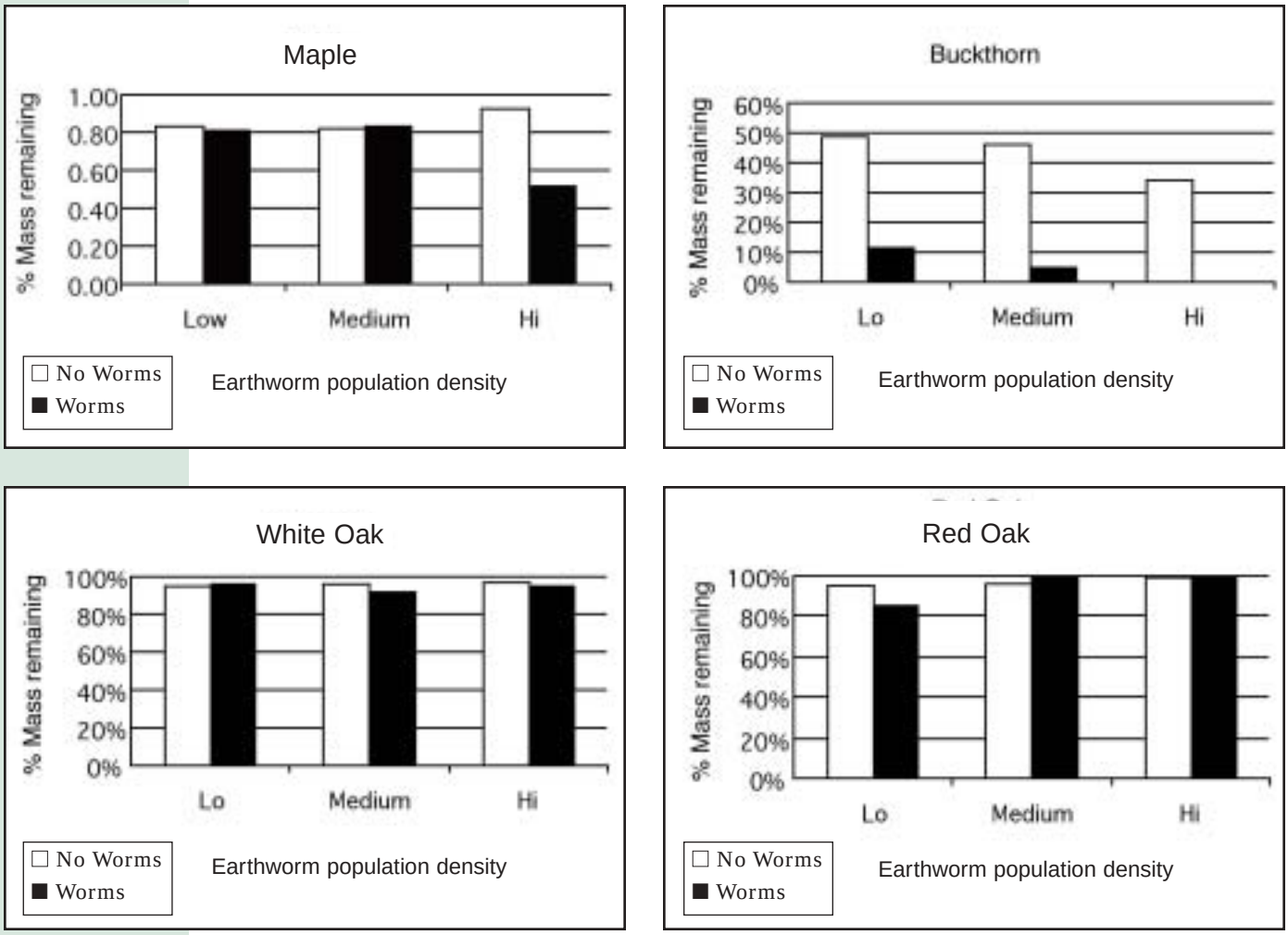

Fig 1. Mass remaining after three months in litterbags, which could be accessed by earthworms (Worms) or excluded earthworms (No Worms) along an earthworm population density gradient (Heneghan, Fagen, and Steffen in prep*).*

Implications
Earthworms are major contributors to important ecosystem processes – they are direct comminutors of leaf material, and are therefore a major direct contributor to litter breakdown. In circumstances where they are native their role in biogeochemical cycling is closely linked to the growth of plants. When introduced these same species can have a significant impact on the invaded systems. Gundale (2002) demonstrated that with the loss of forest floor, a fern species, B. mormo, of some conservation significance is lost as this plant requires mychorrizal associations that become disrupted with the loss of a well-developed litter layer.

We have shown in the experiment described above that earthworm activity in litterbags can result in the complete incorporation of buckthorn litter into the soil. The impact remained a substantial one when maple leaves were presented. However, oak leafs appear to be unpalatable (are at least not a favored substrate) to earthworms, over the course of the experiment (3 months). Although these results are preliminary results from on on-going and more extensive study, they have the following implications:

1. Systems that are degrading through the encroachment of buckthorn and sugar maple are likely to support higher abundances and a greater biomass of invasive earthworms. This arises simply from making more resources available to the earthworms.
2. A rapid loss of forest floor material is likely to result from areas where earthworm populations are substantial. The loss of forest floor material is likely to have a substantial effect on invertebrate populations. The collapse of invertebrate populations in buckthorn patches has been demonstrated in a study by Heneghan and Bernau (in prep).
3. It is likely that when buckthorn and earthworm populations develop the sort of synergistic relationship described above, residual long-tem impacts of invasions will be found. That is, even after buckthorn is removed effects of plant populations will linger, mediated by the modified soil processes.
4. Systems where oak dominates should, according to the initial findings of this study, host smaller invasive earthworm populations. Therefore sites that are maintained as high quality oak woodland, or possibly restored to oak woodland, will have a measure of protection from earthworm impacts.

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Collaborators
Collaborators on these projects include Jim Steffen, Restoration ecologist at the Chicago Botanic Garden, and DePaul University students Brad Bernau, Kristen Fagen, and Farrah Fatemi.

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Book Review

Taking Sustainable Cities Seriously: Economic Development, the Environment, and Quality of Life in American Cities

Kent E. Portney
The MIT Press: Cambridge, Massachusetts

There is no set definition as to what it means for a city to be sustainable, but in general it is held that achieving sustainability involves minimizing negative environmental impacts, while ensuring positive social and economic benefits for all of the city's residents. Sustainability, however defined, is an increasingly important goal for cities as the world's population continues to grow and to become increasingly urbanized.

In *Taking Sustainable Cities Seriously*, Kent Portney addresses the issue of how some American cities are working to achieve sustainability. Noting that the concept of sustainability is too new for cities to have come close to being sustainable, Portney instead looks at the processes cities are undertaking to move towards being sustainable. He identifies and profiles 24 cities where there has been an organized process to identify sustainability indicators and where sustainability plans have been developed. Portney claims these cities take sustainability seriously, and he attempts to measure their success by ranking them against a "taking sustainability seriously index." The first four chapters of this book identify and discuss measures of sustainability used in the index. Following these are chapters on the communitarian foundations of sustainable cities and on issues of environmental and social equity. In the final three chapters, Portney provides detailed descriptions of the sustainability initiatives in eight cities and brief sketches of specific initiatives in the others.

Taking Sustainable Cities Seriously is not without flaws. By focusing on the sustainability planning process rather than on actual outcomes, some of the cities Portney profiles rank high on the sustainability index scale, but currently are quite unsustainable. Some cities, including Chicago, are not discussed at all, because while they do have sustainability initiatives, they have not undertaken a citywide sustainability indicators process. Other shortcomings of the book include a failure to fully discuss the political context in which sustainability discussions must occur, lack of resolution about the relationship

between communitarianism and sustainability, and the lack of recognition of differences between older built up cities and newly developing urban areas.

As Portney argues, it is probably too soon to determine the progress made by American cities towards achieving sustainability. But it is not too early to raise the issue. Thus, this is an important book for urban environmentalists to read, as they will learn what some communities are doing to move towards sustainability, and what could be done to initiate discussions about sustainability in their communities.

Reviewed by William Peterman, Coordinator of the Calumet Environmental Resource Center at Chicago State University. For questions, contact the reviewer at w-peterman@csu.edu.

Web Site Review

Butterflies of North America

Robert Sullivan
Argonne National Laboratory

Butterflies of North America (http://www.npwrc.usgs.gov/resource/distr/lepid/bflyusa/ bflyusa.htm) is devoted to providing basic information about butterflies, with a special emphasis on state and county inventories of butterfly species. Anyone with an interest in butterflies will find much of value at this site, and professionals will find it to be a useful reference tool. The site's editors include Paul A. Opler, Ray E. Stanford, and Harry Pavulaan, authors of numerous books on the topic. The site is sponsored by the Northern Prairie Research Center, part of the United States Geological Survey.

While there is a broad array of butterfly-related information on the Butterflies of North America web site, the heart of the site consists of pages devoted to individual species of butterflies. Each species page features a photograph of the adult butterfly (and often the caterpillar and chrysalis as well), thirteen key pieces of information about the species, and a map showing the species distribution across the United States and Northern Mexico.

Information provided for each species includes common and Latin names, size, identifying characteristics, life history, flight, caterpillar hosts, adult food, habitat, species range, conservation status, and management needs. Chicago Wilderness members may find the conservation and management needs items to be particularly useful. For the true devotees, each page also includes a list of references for more information on the species.

Species pages can be reached by several methods:

1. selecting a thumbnail photo of the adult butterfly, from pages of photos organized by family;
2. selecting a state from a U.S. map, then selecting an individual species from a list of all butterfly species recorded for that state; or
3. selecting a particular county from a state map, then selecting a species from a list of all butterfly species recorded for that county.

Using the thumbnail photos to identify a particular butterfly is useful for identification purposes, and getting state and county listings through map selection is very helpful for conservation and management needs. Forms and instructions are also available to report new county sightings.

A quick count of the thumbnail photos indicates that about 645 species are currently listed on the web site, out of a total of approximately 680 species in all of North America. Given that the web site coverage does not include Canada or Southern Mexico, it's a safe bet that nearly any butterfly you're likely to find is listed on the Butterflies of North America web site. While my entomology credentials are limited to a single undergraduate course, the ecologists on our staff at Argonne National Laboratory use this site routinely, and cite it as the authoritative butterfly source on the Web. Clearly, an enormous amount of effort has been put into the content of the site, and providing multiple ways to access the information (text, photos, and maps) adds greatly to its utility. There are loads of references and a good number of links, further enhancing the site's usefulness.

While there is a wealth of useful information on the *Butterflies of North America* web site, there are some weak spots. Many of the adult butterfly photos could be better, and a number of species pages lack photos of the caterpillars. The thumbnail photos are poorly indexed, making location of a particular species difficult. In general, the interface is inelegant, and navigation is minimalist and sometimes confusing. The site would benefit greatly from a search tool. The species pages and maps are generally thorough and well-executed, the other content less so.

Despite these shortcomings, *Butterflies of North America* is rich in content, useful, interesting, and fun to visit. If your real passion is moths, then visit the companion web site *Moths of North America* (http://www.npwrc.usgs.gov/resource/distr/lepid/moths/mothsusa.htm), which is nearly identical in structure and approach. While you're at it, visit the closely related *Caterpillars of Eastern Forests* (http://www.npwrc.usgs.gov/resource/2000/cateast/cateast.htm).

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Do you have important research or a great success story that you believe your Chicago Wilderness colleagues would find interesting and useful? These guidelines explain what we're looking for and how to submit an article.

Chicago Wilderness Journal Guidelines to Authors

About the *Chicago Wilderness Journal*

Mission of the *Chicago Wilderness Journal*:

1. Facilitate the sharing of results and lessons learned from member-initiated projects and activities, including coalition-funded projects, team activities or the work of individual member organizations that would be useful to the wider membership;
2. Through easily consumable articles discuss practical implications, interpret data, and/or make recommendations about issues within the areas of science, land management, sustainability, education, and communication in the Chicago region;
3. Foster a sense of community among Chicago Wilderness members and improve members' ability to communicate with diverse audiences.

This journal is:

- A forum for sharing important results and lessons learned through biodiversity conservation work,
- An interdisciplinary publication that features a mix of articles in each issue from the fields of science, land management, education, communication, and sustainability,
- An online journal, published three times a year, guided by an editorial board made up of Chicago Wilderness members and coalition staff.

This journal is not:

- A peer-reviewed journal,
- A forum of advocacy or political positions,
- A newsletter with event announcements,
- A means of presenting biodiversity issues to the general public.

What we're looking for in an article

Submissions will be considered from the volunteers and employees of Chicago Wilderness member organizations, and from participants in Chicago Wilderness Teams and projects. Articles should report on the results of a Chicago Wilderness project, workshop, roundtable, or the results of such work performed by an individual Chicago Wilderness member organization. While the emphasis of this publication is on Chicago Wilderness members and affiliates, submittals from outside the membership that are relevant to the Chicago Wilderness audience will also be considered. The topic should

pertain to biodiversity conservation in this region. Articles should emphasize the lessons learned and interpretation of data, rather than methodology or simply reporting of results.

Questions to answer in the article include:
- Why did you undertake the project and what did you do?
- What did you learn from the experience? What do your results tell you?
- What are the practical or applied implications of the work – both in your field and in other fields?
- Based on what you learned what do you recommend to Chicago Wilderness members?

Note that articles don't necessarily need to tell a success story; if valuable lessons were learned from an unsuccessful project, please consider submitting an article.

Target audience

The target audience for this journal is the volunteers and employees of Chicago Wilderness member organizations, and participants in Chicago Wilderness Teams and projects. To meet the needs of this broad audience, articles should:
- Emphasize practical implications,
- Be easy to read and interesting, not overly technical and full of jargon,
- Be short but refer to additional sources of information for interested readers,
- Help readers feel connected to other Chicago Wilderness members,
- Offer readers information and resources that will help them carry out their jobs.

Article format

Please submit your article as a Microsoft Word or WordPerfect file. Articles should be three to five pages in length (approximately 450 words per page if there are no pictures or graphics; 250 words per page if graphics are included). Pictures and graphics are welcome and encouraged, but the editorial staff will make final selections! Graphics files can be submitted at 72 dpi, actual size or larger. JPG files are the preferred format for graphics. The journal can accommodate sidebars, so please indicate if there are quotes or charts that you would like set out from your article.

All articles must include the following components:
- A short abstract of several sentences that will quickly capture the reader's attention,
- A description of the work you did and why you did it,
- Results and implications for Chicago Wilderness partners.

Beyond these requirements, articles may follow a variety of outlines as suggested by these examples:

Traditional scientific research format:
- Abstract
- Objectives
- Methods
- Results and Discussion
- Conclusion / Recommendations / Implications
- References

Report on outcome of a workshop:
- Abstract
- Rationale for workshop; reasons to learn more about topic
- Main points made at workshop
- Insights gained from talks and discussions
- Conclusions and final recommendations

Description of the development of educational tool or product:
- Abstract
- Rationale for project
- Brief description of final product (e.g. curriculum, model policy)
- Lessons learned from development process
- Recommendations to others attempting similar work
- Recommendations on use of product

Submission procedures

Authors can submit either an article or a query to Elizabeth McCance at emccance@chicagowilderness.org. Queries should include a thorough abstract of the intended topic. Articles and all accompanying graphic files should be submitted electronically to Elizabeth. Be sure to include the author's contact information. Submissions can also be saved on a disc and mailed to Elizabeth at 8 South Michigan Ave., Suite 900, Chicago, IL 60603.

Although articles will be accepted on an ongoing basis for consideration in all upcoming issues, a rough schedule of deadlines follows:
- For March issues: first drafts will be due the second Friday of the preceding December,
- For July issues: first drafts will be due the second Friday of the preceding April,
- For November issues: first drafts will be due the second Friday of the preceding August.

Authors are welcome to submit articles that have already been published, as long as the article contains specific implications for Chicago Wilderness, and the author observes copyright law and has obtained the appropriate permissions for reprinting. If your submission has been published elsewhere, please indicate where and when it was published so we can note this in the journal.

The journal's editorial board recommends that if possible, authors should work with their internal PR departments for assistance in translating specialized information into material that is accessible to a more general audience. In addition, members of the journal's editorial board will partner with authors to adapt the style and format of articles to be most useful to the broad Chicago Wilderness audience.

For more information, contact Elizabeth McCance at (312) 580-2138.

About the *Chicago Wilderness Journal*

The *Chicago Wilderness Journal* is published by the Chicago Region Biodiversity Council (Chicago Wilderness) on its member web (www.chicagowilderness.org/members) site three times per year, in March, July and November.

An editorial board made up of scientists, sustainability professionals and communication specialists from Chicago Wilderness member organizations guides the production of each issue in accordance with the mission of the journal and the goals of Chicago Wilderness.

Board members are:
- Kristopher Lah, U.S. Fish and Wildlife Service
- Kathy Maloney, The Morton Arboretum
- William Peterman, Chicago State University
- Maria Sadowski, Brookfield Zoo
- Robert Sullivan, Argonne National Laboratory

Support is provided by the following Chicago Wilderness staff members:
- Rebecca Blazer
- Irene Hogstrom
- Elizabeth McCance
- Michael Pond
- Diane Trgovcich-Zacok

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3. Foster a sense of community among Chicago Wilderness members and improve members' ability to communicate with diverse audiences.

For information on how to submit articles or queries, please refer to the Guidelines to Authors posted on the journal's home page. For other inquiries about this publication, please contact Elizabeth McCance at emccance@chicagowilderness.org.

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