

Plants of Concern: Standardized Rare Plant Monitoring Using Trained Volunteers

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with comparative discussion from 2001-2011

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PLANTS OF CONCERN: CONCEPT AND OBJECTIVES

This document is a report covering the period July 19, 2012 through December 31, 2013 with detailed analysis of the 2012 season in relation to previous seasons, as well as a preliminary account of the 2013 season. Final 2013 numbers are not yet available.

Launched in 2001, Plants of Concern (POC) is a long-term rare plant monitoring initiative unique to the region in its use of standardized monitoring protocols used by trained citizen scientists. The program has completed 13 years of monitoring and has accumulated a substantial base for analyzing long-term data on a significant number of species and Element Occurrences (EOs).

Species monitored by POC were initially selected from the 1999 *Chicago Wilderness Biodiversity Recovery Plan's* priority list, because they were state endangered or threatened and considered by regional land managers and ecologists to be significant within the Chicago Wilderness region. POC staff and landowners have since decided that any listed plant was eligible to be included in the program. Non-listed "species of concern" have been added when individual landowners express interest in tracking them. These rare species usually have a coefficient of conservatism index of 9 or 10 (Swink and Wilhelm, 2004). Through 2012, POC monitored 126 listed and 123 rare species. In 2013, an additional 12 species were added, five of which are state listed.

The primary geographic area covered by POC from 2001-2006 included the six counties of northeast Illinois, with one site in Kankakee County. In 2009, four sites from Kendall County were added. By 2012, POC was working in 8 northeastern IL counties. Because of POC's Chicago Wilderness affiliation, 14 sites have been added in northwest Indiana and six sites in southeast Wisconsin beginning in 2007 (see GIS Map, Attachment 1). This report will focus on Illinois counties and species with reference to the entire program.

POC incorporates the following interrelated elements, all equally important to its success and recognition as a unique and valuable long-term monitoring program:

- Monitoring rare plants, particularly state-listed species, over time using a standardized census protocol (plant numbers, population area, GPS coordinates, threats, and management activities) on populations on a regional basis (Attachment 2). Select species have been targeted for more intensive "Level 2" demographic monitoring that supports projects coordinated by CBG researchers assisted by volunteers.
- Monitoring rare species in relation to management activities as reported by both monitors and land managers to form a feedback loop for short- and long-term adaptive management responses (Attachments 3a, b and c).
- Analyzing the long-term POC dataset for an increased understanding of population trends in relation to management activities and to invasive species and other threats.
- Training volunteers as citizen scientists to leverage agency resources for monitoring rare species and to create an informed conservation constituency.
- Working in partnership with public and private landowners, land managers, and agencies, through an Advisory Group (Attachment 4) and ongoing correspondence and consultation to generate a shared approach to regional monitoring.
- Submitting monitoring data to landowners, the Illinois Natural Heritage Database (for listed species) and the Illinois Nature Preserves Commission (for species monitored in Nature Preserves).

In 2012 and 2013, two full time staff members, Manager Susanne Masi and Research Assistant Rachel Goad, managed the overall POC program. Two other seasonal research assistants focused on work at Midewin National Tallgrass Prairie on a POC-based monitoring program, and with the Forest Preserve District of Cook County monitoring effort, respectively. A part-time intern was assigned to the Openlands Lakeshore Preserve POC monitoring program in summer 2012 and an ACI (Associated Colleges of Illinois) intern assisted POC in summer 2013. Susanne Masi retired from her position at the end of 2013 and Rachel Goad was appointed the new Manager of POC beginning in 2014.

PLANTS OF CONCERN'S PUBLIC FACE

Plants of Concern's collaborative relationships extend across the Chicago Wilderness region and beyond; the program is now nationally recognized as a viable model for a citizen science-based monitoring program. Below are some examples of POC's impact and recognition.

Program Influence

POC staff were consulted about its program structure, protocols, and volunteer component by Dr. Steve Young, Chief Botanist, New York Natural Heritage Program (The Nature Conservancy -Albany) and Coordinator of the Long Island Invasive Species Management Area. He wishes to create a similar program for New York and, if funded, will model it in part after Plants of Concern.

The Nature Keep Conservation Group in the Barnveld-Blue Mounds region of southwest Wisconsin has been using an adapted version of POC protocols on privately owned conservation sites and Wisconsin DNR or land trust-owned sites. In 2013 they worked with multiple landowners, 26 volunteers and with Wisconsin DNR staff on 14 sites.

Susanne Masi was invited to present POC as a model citizen science program at Botany 2013, held in New Orleans in July 2013. The presentation was part of a symposium on Public Participation in Scientific Research (PPSR). Her presentation was co-authored with Rachel Goad and was a follow up to her poster presentation on Plants of Concern at the first stand-alone PPSR conference in Portland, OR, August 2012. (See citations below).

Susanne Masi was approached by Owen Boyle, Citizen-based Monitoring Coordinator, Wisconsin DNR, Timothy Vargo, Manager of Research and Citizen Science, Urban Ecology Center, Milwaukee, and Christopher Lepczyk, University of Hawaii at Manoa, to write a chapter of a *Citizen Science Manual* to be published by the University of California Press. The chapter will be co-authored by Susanne, Rachel Goad (current POC manager) and Dr. Pati Vitt (Manager of Conservation Programs for the Garden).

In 2013, Plants of Concern GPS data on invasive species locations was shared with the Northeastern Illinois Invasive Plant Partnership (NIIPP), where it filled significant gaps in their reporting. POC monitors regularly report invasive species locations, and many of these are species on which NIIPP has had difficulty collecting data.

Data for all Wisconsin EOR's were shared with Wisconsin's Department of Natural Resources in 2013.

Awards

Susanne Masi and POC were recognized through an award from the North Branch Restoration Project (January, 2013). Additional awards announced in 2013 and to be presented in 2014 were: the Habitat Project, Audubon-Chicago Region (February, 2014) and the Forest Preserve District of Will County (March, 2014). (See citations below.)

Communication and Outreach

A comprehensive listing of POC's communication and outreach efforts is found in the citations section (at end), which demonstrates the extent of the program's influence and networking. POC continues to have active partnerships with the following regional groups and projects: The Habitat Project (Audubon-Chicago Region); New Invaders Watch List (Northeast Illinois Invasive Plant Partnership and the Forest Preserve District of Lake County); Chicago Wilderness Natural Resources Management Team; The Volunteer Stewardship Network of The Illinois Nature Conservancy; Alliance for the Great Lakes; Waukegan Harbor Citizens Advisory Group; and the Carol Freeman Photography Endangered Species Project.

Plants of Concern Website

The POC website (www.plantsofconcern.org) was created in late 2003. Since the installation of Drupal, a content management system, all POC staff members are able to manage the web site content. The intent of the website is multi-faceted. It is a way to spread the word about rare plants and the POC program, recruit new volunteers, and provide news and monitoring resources such as downloadable forms, form submittal, and plant information to monitors.

In November 2013 the POC database was moved to a new website service provider and therefore visitorship information is not available for the year.

There are seven menu sections on the website, with two that include sub-sections:

- Home - contains introductory paragraphs about the POC program.
- About POC
 - About Us - shares background information about the program, its goals and achievements and statistics from previous years.
 - Funders - provides a list of partner websites and programs that have funded POC.
 - POC Staff - lists the entire POC staff and contact information.
- News & Events - displays newspaper articles about the program, as well as postings of event announcements for workshops, plant outings and meetings.
- Forms & Protocols lets monitors download up-to-date monitoring forms, land management forms, and guidelines and instructions on GPS usage, and pacing and population estimation guidelines. The Plants of Concern Volunteer Manual is also available for download in this section.
- Plant Resources
 - Plant Information Websites provides a list of links to other plant resources that are related to POC or to rare plant monitoring.
 - Monitored Species Bloom Times displays the bloom time range of all POC monitored species.
 - Monitored Species Photo Gallery consists of individual web pages for each plant monitored by POC as well as photos of the species by Carol Freeman and volunteers and links to various plant resources.
- My POC Account allows monitors the opportunity to view and submit their monitoring forms online and allows land managers to view the monitoring and land management forms pertaining to all of the sites they manage.

Website goals for 2014 are as follows:

- Export data with shape files
- Interactive mapping of monitored species for each user
- Basic visual statistics for each land manager account
- Continue correcting GPS points in database
- Continue scanning POC monitoring forms

SUMMARY: CUMULATIVE MONITORING RESULTS 2001 – 2011

In 2012, POC’s 12th year, the program held relatively steady in measures of accomplishment and participation. The number of monitored subpopulations increased slightly from 2011, and although the number of monitored EOs declined from 2011, this was not below 2010 levels. Nearly half (44%) of all EOs monitored in previous years also monitored in 2012. In 2012, 122 new EOs were monitored, nearly twice as many as were newly monitored in 2010. The Illinois Natural Heritage Database tracks 1048 EO’s of 182 listed species in seven northeast Illinois counties (July 2012). POC monitors 72% of the listed species that this agency records, in 651 EO’s. It is important to note that a single EO in the state database may correspond to several EO’s in the POC database, which occur at more narrowly defined sites.

The following graph and table are discussed in detail in the remainder of the report and in Attachments 5-7. (Note: Statistics in the following figures, tables and attachments were derived from the POC database for analysis on several different dates starting November 2013 and may reflect minor discrepancies in numbers. Graphs from previous years may not correspond precisely due to late report submissions, merging of subpopulations and other factors).

Figure 1. POC accomplishments and participation for all years, 2001-2012. Includes IN and WI. See tables below.

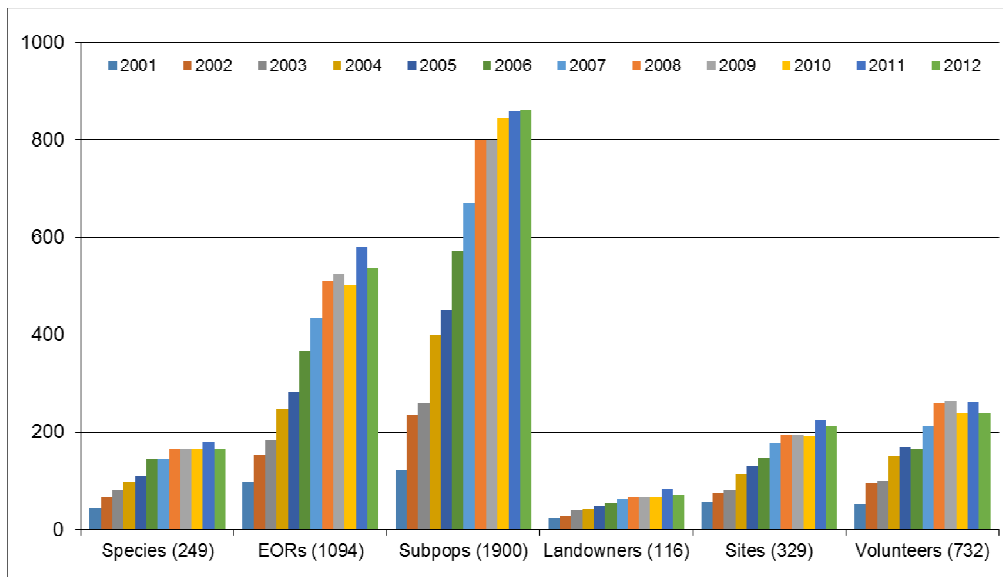


Table 1A. POC accomplishments and participation for all years, 2001-2012, including IN and WI.

	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	Cumulative
Species ⁺	45	66	81	98	109	145	145	165	167	165	180	167	249
EORs	98	153	183	248	282	366	434	510	526	503	581	536	1094
Subpopulations*	123	236	260	401	451	570	670	799	800	845	859	861	1900
Landowners	23	29	39	41	47	55	64	68	66	68	83	72	116
Sites	57	73	81	114	131	146	178	194	194	190	225	213	329
Volunteers	53	96	100	151	169	167	211	260	264	240	262	237	732

⁺ Includes 126 (IL) listed and 123 rare, non-listed species (Attachment 5).

*A subpopulation is defined as a grouping of a species within the same EO that is tracked separately because it is located more than 50 meters from another grouping, or because the grouping is within a different management unit or habitat.

Table 1B. POC accomplishments and participation for all years, 2001-2012, in northeastern Illinois only.

Northeastern IL	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	Cumulative
Species ⁺⁺	45	66	81	98	109	143	143	162	164	163	175	161	239
EORs	98	153	183	248	282	363	412	486	493	485	561	517	1031
Subpops*	127	237	263	405	454	570	639	758	729	818	827	841	1762
Landowners	23	29	39	41	47	53	59	63	63	66	75	64	106
Sites	57	73	81	114	131	144	171	187	188	186	212	200	310
Volunteers	53	96	100	151	169	163	201	239	245	236	251	226	690

⁺⁺ Includes 122 IL listed and 117 rare, non-listed species.

*A subpopulation is defined as a grouping of a species within the same EO that is tracked separately because it is located more than 50 meters from another grouping, or because the grouping is within a different management unit or habitat.

Species monitored in multiple Illinois counties (see Attachment 7 for a breakdown of listed and non-listed species and the number of EOs monitored for each).

Species (listed and non-listed) monitored across multiple counties are the basis for a regional assessment of species status.

Illinois

1 species⁺ in 6 counties

9 species in 5 counties

18 species in 4 counties

33 species in 3 counties

59 species in 2 counties

119 species in 1 county

⁺*Cypridium candidum* is the only species monitored in 6 counties.

2001-2012 cumulative EOs monitored (listed and non-listed), by IL county:

Cook:	244
DuPage:	185
Kane:	72
Kankakee:	2
Kendall:	11
Lake:	321
McHenry:	129
<u>Will:</u>	<u>67</u>
Total:	1031

THE VOLUNTEER COMPONENT OF POC: CITIZEN SCIENTISTS

Without volunteers, POC could not function successfully. Each major agency working with POC has one or two staff, usually a volunteer coordinator, and/or ecologist assigned to work with POC in recruitment, training, and field assistance of volunteers. These partnerships are critical to successful volunteer engagement and retention across the region.

Both public conservation agencies and private groups recognize the importance of leveraging volunteer resources for monitoring and management work. Citizen Science, now termed Public Participation in Scientific Research by the Citizen Science Central (based at the Cornell Lab of Ornithology), is increasingly acknowledged as a method for gathering reliable and valuable data, thereby greatly expanding potential for data gathering and scientific work and analysis.

Factors influencing volunteer participation, 2012-2013

Spring 2012 brought special challenges to all monitors. Because of record warm temperatures in early spring, plants started to bloom a month or more earlier than normal, some before our training workshops were completed and new volunteers assigned to their species. There followed a challenging period of rapid communication with volunteers and volunteer coordinators as well as field checking for blooms in order to get the many spring-flowering species monitored in time. Many monitors did rise to the occasion. The record-breaking high temperatures and drought during the summer brought additional challenges to volunteers, and to the plant species themselves. Final tallies for 2012, shown in Figure 1 above, demonstrate the effects of these conditions on POC volunteer numbers as well as sites visited and species monitored. All indices fall slightly below those for 2011, with the exception of the number of subpopulations monitored.

Weather conditions were milder in 2013, and initial tallies indicate that more monitoring likely occurred as a result. However, starting in 2013 all Chicago Botanic Garden volunteers, including POC volunteers, were required to authorize a criminal background check, a practice that is becoming standard in volunteer programs. This requirement was retroactive and involved all former as well as new volunteers. However a number of POC volunteers, some of them long-standing, formally objected and refused to participate. Other volunteers may have dropped out silently, simply not participating. All new volunteers complied with the requirement. For monitors active in 2013, 64% have submitted to the check, while 47% of all active monitors from all years have done so. We anticipate more submissions to come. Volunteers in this report were not excluded if they had not yet submitted to the background check in 2013, but final tallies for 2013 will show whether there was a significant decrease in volunteer numbers.

Volunteer statistics

Table 2: Number of cumulative volunteers by county as of 2012 (Some monitors have assignments in more than one county).

Illinois		Wisconsin		Indiana	
Cook	282	Kenosha	16	Lake	8
DuPage	69	Walworth	13	LaPorte	4
Kane	75			Porter	13
Kankakee	4				
Kendall	9				
Lake	233				
McHenry	133				
Will	114				

New volunteers in 2012 (total: 58, 12 monitored in two or more counties)

Cook: 17; DuPage: 7; Kane: 7; Kendall: 1; Lake: 18; McHenry: 20; Will: 12. (IN: 4; WI: 0)

Average: 10 new volunteers per Illinois County.

Volunteer retention

Retention from 2011 to 2012: 61% (143 of 234) of those who monitored in 2011 were retained in 2012

Retention from 2001 to 2012: 45% (24 of 53) of volunteers who monitored in 2001 monitored in 2012

Retention into 2012: 62% (146 of 234) volunteers who monitored in 2012 also monitored previously

Of interest is that 131 of the 234 volunteers (56%) who monitored in 2012 had monitored for three or more preceding years, and 276 of 731 volunteers (38%) who monitored at any time in the program did so for three or more years.

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Volunteers monitoring for 12 years: 10
Volunteers monitoring for 11 years: 14
Volunteers monitoring for 10 years: 13
Volunteers monitoring for 9 years: 14
Volunteers monitoring for 8 years: 20
Volunteers monitoring for 7 years: 22
Volunteers monitoring for 6 years: 30
Volunteers monitoring for 5 years: 53
Volunteers monitoring for 4 years: 41
Volunteers monitoring for 3 years: 59
Volunteers monitoring for 2 years: 123
Volunteers monitoring for 1 year: 332 (includes 59 new volunteers in 2012)

Volunteer hours

Hours worked by POC volunteers may fall into one of the three following categories. Hours accumulated from 2011 are shown for comparison.

Hours volunteered	2012	2011
Field	1826	2008
Workshop training	432	418
Office	512	511
Total	2770	2937

Stewards as monitors

In 2012, 51 of 237 volunteer monitors (22%, the same as in 2011), were also volunteer stewards. Overall, 104 of 731 (14%) of cumulative volunteers have been stewards.

Recruitment

Volunteers are recruited by agency volunteer coordinators and by current POC monitors through word of mouth. Other recruitment avenues include articles and announcements in stewardship newsletters, such as *The Habitat Herald* and Midewin's *Tallgrass Telegraph*, *Grounds Cover* (the Garden's volunteer newsletter), the Chicago Environmental Network Website, and POC staff presentations at meetings such as Wild Things, Lake County Audubon, and Wild Ones. Training workshops are listed on the POC website and promoted through stewardship newsletters and email newsletters to previous, current and prospective POC volunteers.

Training

The two different formats for volunteer training each year are day-long spring workshops and in-field training. Four workshops were offered in 2012 – one each in McHenry, Cook, Kane, and Will Counties in Illinois. Seventy-two volunteers learned POC program objectives and were trained in monitoring techniques for Level 1 protocols. In 2013, 70 volunteers attended four training workshops held in Cook, Will, and Kankakee Counties. Representatives from county agencies presented information about rare plants monitored in their counties, guided volunteer assignments, and discussed the relationships between monitoring and management and the benefits of POC in relation to their work. The sensitivity and confidentiality of rare plant locations were stressed in training sessions, and new volunteers were required to sign a Confidentiality Form. In the field, POC program staff, interns, agency ecologists, site stewards, or experienced volunteer monitors provided new monitors with additional field mentoring and orientation to the sites and populations. In addition, several monitoring forays led by POC staff and partner land managers are held each year at larger sites such as Illinois Beach State Park, Braidwood Dunes and Savanna, Lyons Woods, Lyman Woods and Hickory Creek Barrens, and often attract eight or more volunteers who seek additional training in monitoring protocols.

Volunteer Retention and Commitment

Volunteer retention is essential to ensure continuity of monitoring and consistent application of protocols. Retention rates from year to year have held fairly high, as reported above. The 51 monitors who are stewards represented 22% of all volunteer monitors in 2012. Stewards are individuals familiar with site management and provide reliable reporting on management activities within monitored populations.

At the end of 2013, upon Susanne Masi's retirement as Manager of POC, numerous testimonials were spontaneously provided that demonstrate the dedication and commitment of many long-time volunteers. Three examples follow:

"[Plants of Concern} and Susanne Masi are directly responsible for the creation of the Natural Area at Loyola, which is 4+ acres of native plants...it has been part of a study on Marram Grass and now is the home of five listed species...it has received 5 awards from various community groups and has the support of the Chicago Park District to expand erosion control along the entire beach." Ann Whelan, steward and POC monitor at Loyola Beach, Chicago Park District.

"I am only involved in monitoring two species, but after doing this with two enthusiastic partners for 6 years now, I am impressed how well it works and how much fun it is....we feel that if there are questions or problems, there is always help available. The plants we monitor have become "our" plants and we are glad to see them flourish and sad if they were impacted or not doing as well...." Angelika Brinkmann-Busse, POC monitor in Du Page and Kane Counties.

"Plants of Concern now has more than 13 years of monitoring data. Because of POC, we know much more than we ever did before about what is happening to endangered plant species in our area and whether site management is having the desired effect....none of this work is terribly glamorous. 'Rain or shine' means just that. The work goes on whether it's hot or cold, wet or dry. It continues when insects attack, when brush scratches faces, or when monitors walk through mud. But this is the stuff of science - seeking knowledge by careful, systematic observation, recording data, and cautiously reaching conclusions. If we are to win our fight, we will do it plant by plant, animal by animal..." Victor Cassidy, POC monitor since 2003 in Lake, Cook and Will Counties.

Agency staff members also contribute to program training, continuity, and volunteer retention. Since 2001, POC has worked with many of the same staff from major agencies, and when there has been turnover, a new staff member has been assigned to take on POC responsibilities. It is clear there will continue to be substantial agency staff involvement working with volunteers, as each year new volunteers need support in the field. However, as volunteers are trained, they become more self-sufficient and can successfully mentor new recruits.

POC has built strong, beneficial partnerships with agency staff across northeast Illinois, as well as into Wisconsin and Indiana. For example, in 2013 POC and Susanne Masi were nominated to receive a partnership award from the Forest Preserve District of Will County.

"This award is to honor your hard work and passion for monitoring rare plants in Will County. Without your determination and drive many of the rare plants of Will County would not have been monitored." Juanita Armstrong-Ullberg, Natural Resource-Land Manager, FPD of Will County.

POC's partner in Waukegan on the GLRI grant had this to say:

"[POC] has been extraordinarily helpful in helping us go to a higher level of investigation and reporting as we create a full baseline of data for the southern buffer areas of Illinois Beach State Park." Susie Schreiber, Waukegan Harbor Citizens Advisory Group.

LEVEL 1 MONITORING DATA

Database, Data Submission, Data Review and Confidentiality

All Level 1 monitoring data is entered into a PostgreSQL database developed with the PostGIS extension enabled. The database and website is managed by Bianca Rosenbaum, Conservation Science Information Manager. This system is an upgrade from a MySQL database established in 2012. The “back end” PostgreSQL interfaces with an entirely web-based “front end” coded in PHP. The move allowed our database to become spatial and allows us to create spatial records ‘on-the-fly’. We are now able to map all records on Google Maps as soon as a record is created. The host company backs up data on a daily basis. Data is entered on-line by volunteers and staff via the password-protected, role-restricted POC website. Volunteers must submit field/paper copies of their monitoring forms, but may also submit reports online. An effort to scan all paper forms into a digital archive has been underway. As of January 2014, 54% of all paper-submitted monitoring forms were scanned electronically for archival purposes.

Individual monitors can access only their assigned monitoring reports online and only by means of a password. Online entry saves hours of manual data entry by program staff. Monitoring reports are reviewed for accuracy and completeness by POC staff and landowners, who have access to their own site reports. Data entry and review are typically completed in March, and then reports are submitted to the Illinois Natural Heritage Database, landowners for their respective sites; and the Nature Preserves Commission for nature preserves and land and water reserves.

Changes in the database and content management system have occurred over the past few years. A new content management system, Drupal, was installed in 2012 and is currently being used. This system allows for integration of the website with spatial information in the POC database.

Results and Discussion

The Level 1 analyses below reflect information based on subpopulation reports submitted through 2012. Many EOs have multiple subpopulations. For each category of analysis, only reports with data in the specified category were included in the percentages given. Forms marked NA (Not Applicable) or blank for particular fields were excluded from the percentages given in the analysis, but, where possible, the percentages of the total forms that were excluded due to a NA answer are shown in order to provide a perspective on sample size.

It is important to note that in the analyses presented, data for each year is not based on an equivalent set of populations monitored from year to year. Each year, new populations/subpopulations are added to the program, and previously monitored populations/subpopulations may not be monitored in that year. Therefore, yearly increases or decreases in values do not reflect a cumulative change for the same group of populations.

The overall value of these data is to reveal general levels of threats, management activity, and plant recruitment throughout POC populations. More direct assessment of change or trends is possible when the analysis is applied to the same group of populations over time; with up to 12 years of data on many populations, this analysis can yield robust data. As future resources and funding allow, POC will be able to undertake more detailed analysis.

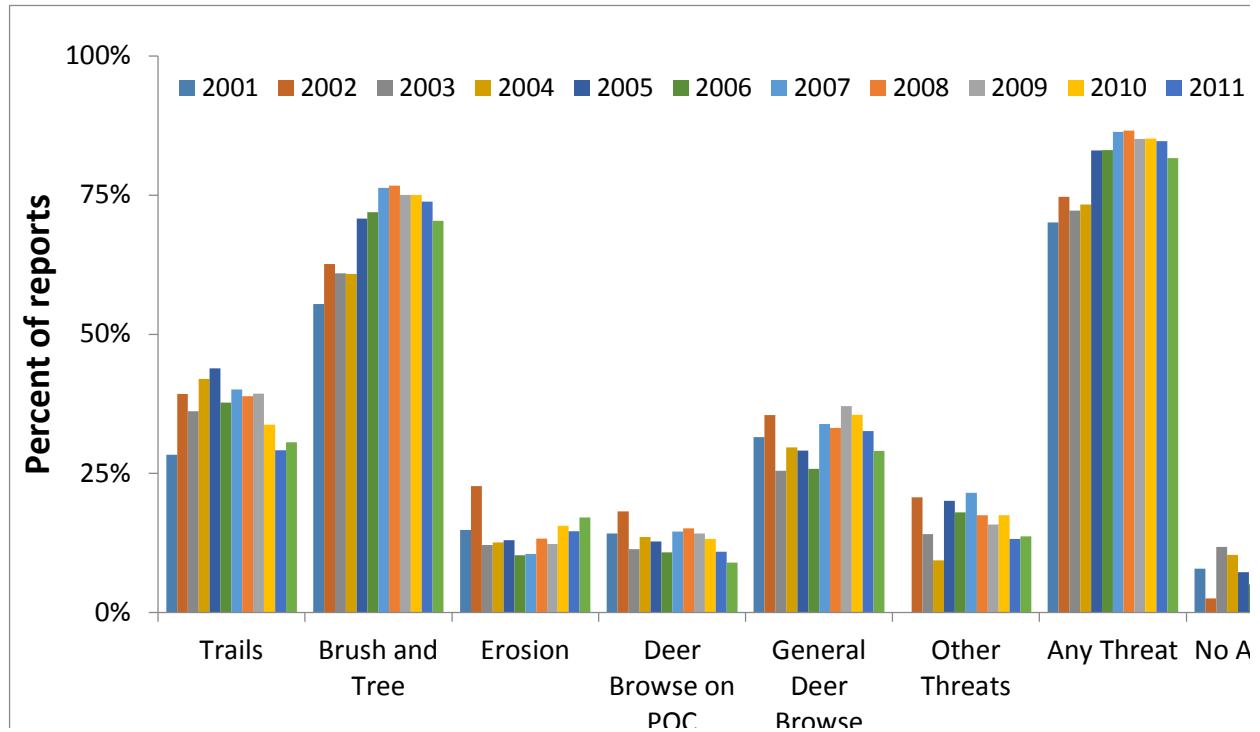
Ecological Threats

Updated December 5, 2013

The percentage of subpopulations that were impacted by at least one ecological threat—invasive brush and trees, deer browse, erosion or trails—was between 70% and 86% from 2001-2012 (Figure 2). The number of populations experiencing any threat initially increased from year to year but has leveled out in recent years. It should be noted that the importance of recording threats to populations has been increasingly emphasized in POC training.

Only unauthorized trails were reported in 2001, so no value is indicated for authorized trails in 2001. Authorized and unauthorized trails were lumped into ‘trails’ for this analysis. In 2001 and 2002, no distinction was made between brush encroachment of less than or greater than 1 meter in height, so the two categories are combined in the figure. For most years, separated data is available for the lumped values. The ‘No answer’ columns indicate the low percentage of reports for which no answer was given for this section.

Figure 2. The percent of subpopulations in each year with a given threat present. The analysis of threats presented here does not reflect the percent impact or magnitude of each threat recorded by monitors, only the presence of the threat.



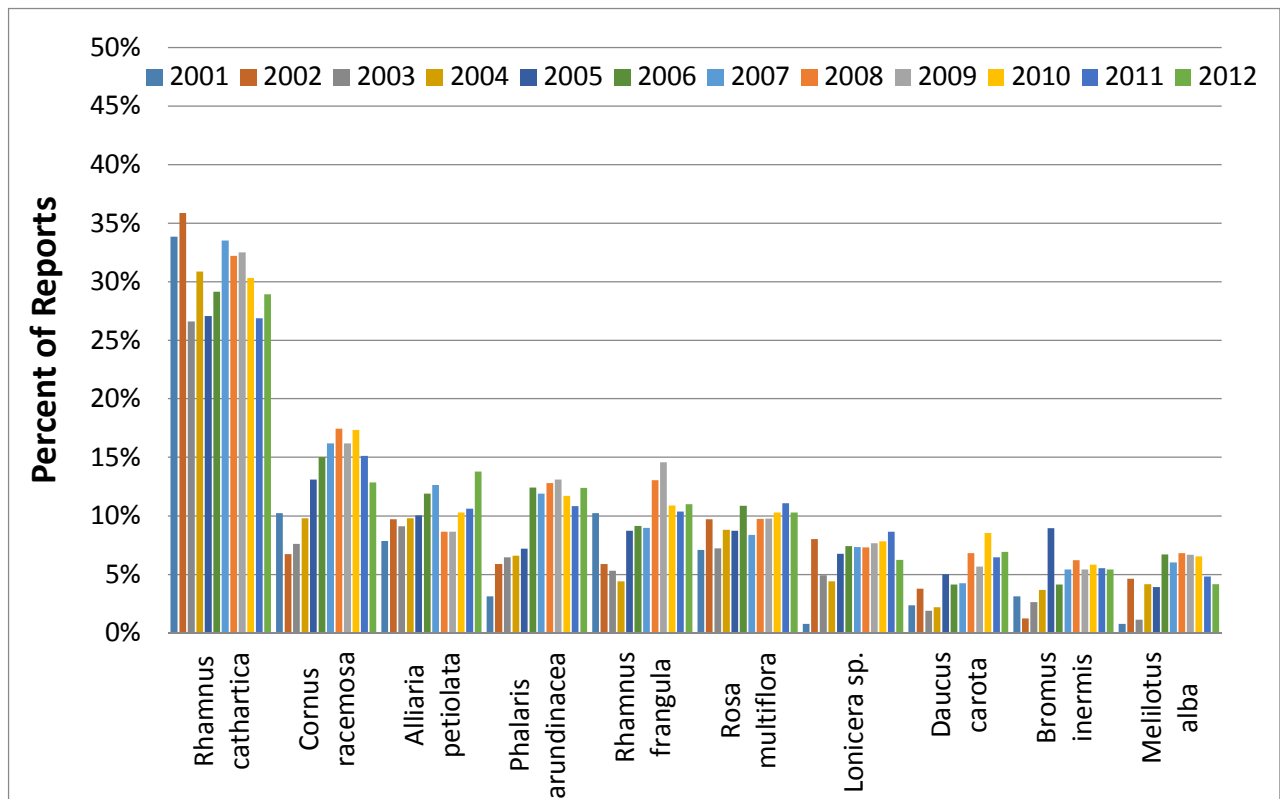
Invasive species

Updated December 5, 2013

Because of the large threat they pose, we examined the occurrence of aggressive native and non-native invasive species. Figure 3 presents the proportion of reports that indicated the presence of the top 10 most reported invasive species in each year of the program. Note that these data do not incorporate the magnitude of effect these species are reported to have.

Monitors have identified 343 distinct species as invasive plants over 13 years, some of them native species and many of them having a minor or contextual presence. In previous years this number has been larger due to inclusion of generic identifications (e.g., *Rhamnus* sp.) which we now exclude. In 2012, 191 separate invasive species were recorded. Of all monitored subpopulations, 87% had at least one invasive species present in 2012 (similar to 86% in 2011). As with threats, this analysis does not look at the magnitude of impact on the individual subpopulations, but it focuses on the percent of subpopulations with any invasive species presence.

Figure 3. Top 10 most reported invasive plant species documented by POC monitors from all years. Percentages are based on the ratio of reports indicating presence of an invasive species to the total number of subpopulations with reports submitted that year.

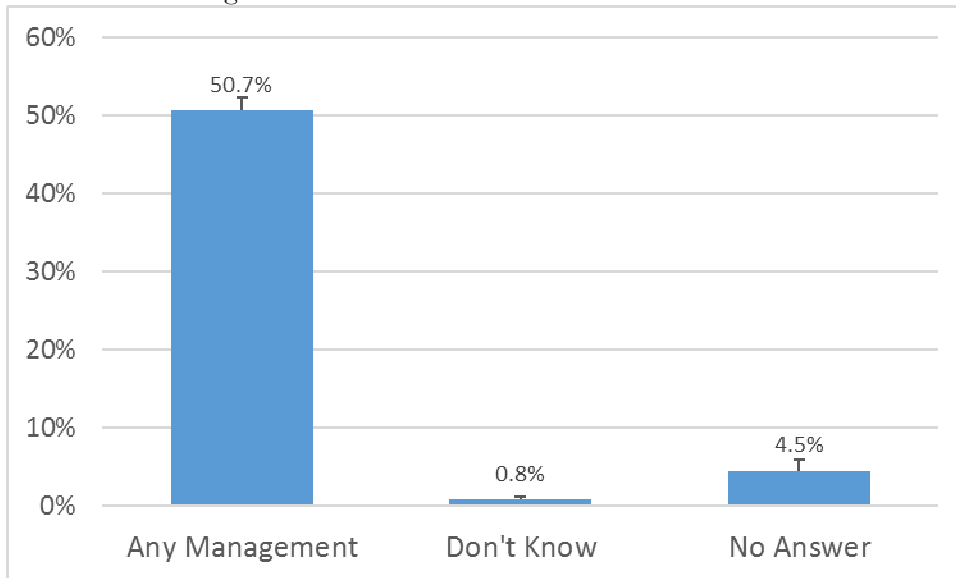


Management
Updated November 2013

An average of 50% of POC populations are recorded as managed over all years (Figure 4A). Only a small percentage of the monitoring forms submitted are left completely blank in the land management section, and just over 5% of all reports indicate that the monitor does not know what management has occurred. Many POC monitors are also staff, stewards, or restoration volunteers at the sites they monitor, and these individuals are knowledgeable about the management activities on-site. Management is categorized into four activities: prescribed burning, woody brush removal, removal of herbaceous invasive species, and mowing (Figure 4B). The first three are the most commonly reported management types, with burning and brush removal showing the most consistent variation among reports over time. Reports for herbaceous removal and mowing are less variable from year to year. Based on 861 reports for 2012, monitors observed that an average of 44% of POC populations showed evidence of some type of management activity, with brush removal, herbaceous removal, and burning all noted in over 16% of reports, and less than 3% of reports indicate mowing as a management strategy (Figure 5).

The 50% of all monitored populations reported as managed can be viewed as a robust number, particularly because annual brush removal or burning within the same population may not be necessary. At the beginning of the program, reported management was more variable for all management activities (Figure 4B). A notable decrease in reported burning and brush clearing occurred from 2001 to 2002, and this may have been due to volunteers largely being assigned to known species locations at sites that were under an active management schedule. The high percentage of mowing reported in 2001 was most likely due to monitors considering mowing for trail or roadside maintenance to be a management strategy. Since then, POC training has stressed the difference between mowing as a management strategy (i.e. to control invasives or brush or as a substitute for burning) and unintentional mowing of the population, as may occur along a mown trail side, which may pose a threat. Other management activities are recorded in an open-ended text field without quantification, include deer culling, fencing/deer exclosures, and hydrological modifications.

Figure 4A. Average percent of reports for all years where any management is reported, where 'don't know' is indicated for management, and where no answer is given.



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Figure 4B. Management observed by monitors for all years. Percentages for individual management techniques are based on only those reports for which a “yes” or “no” answer was given for each management activity (as observed or known by the monitor). The percent of reports with blanks or a “don’t know” response are shown separately. Herbaceous invasive removal was not recorded in a field in 2001.

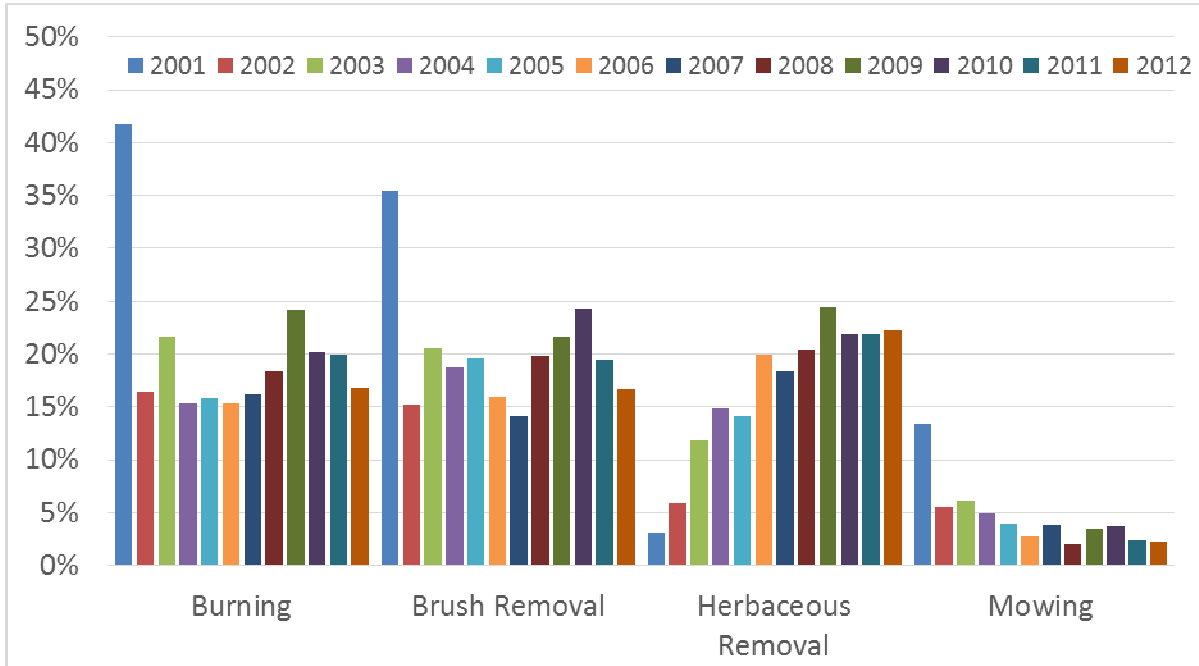
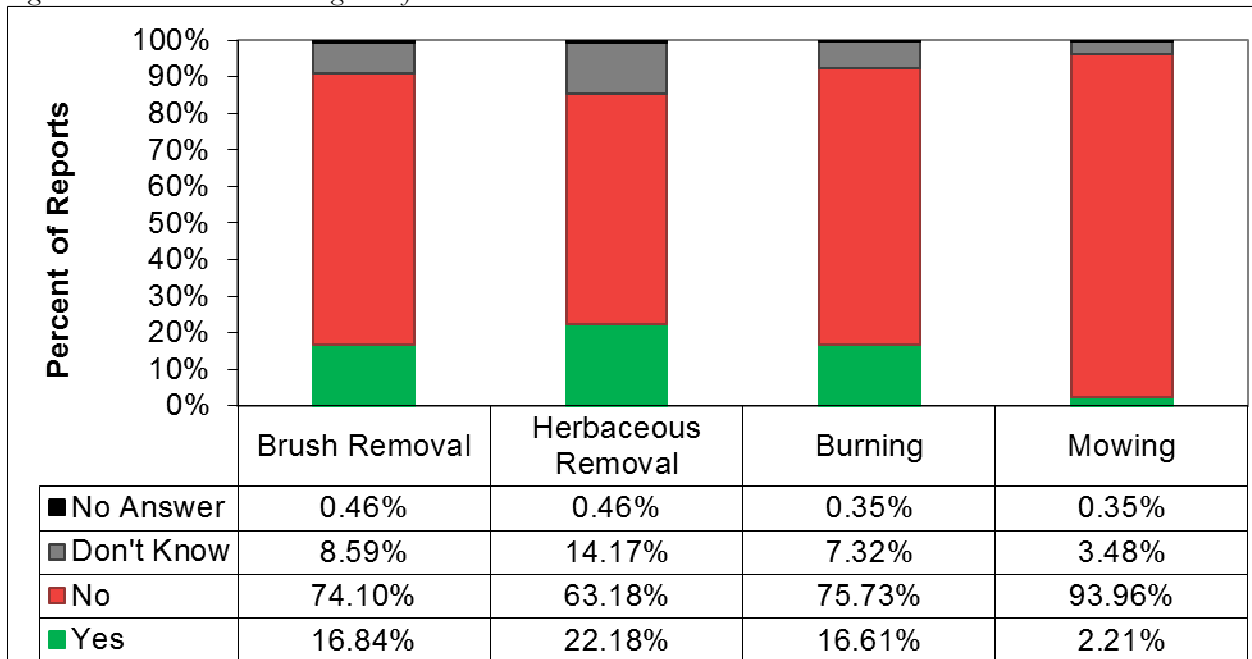


Figure 5. Monitor-observed management for 2012.



Regional species trend analysis

Updated December 2013

Regional trends in species growth or decline were analyzed in order to identify the species that were increasing and decreasing most strongly across the region. Exact counts and count estimates were included in this analysis. Where an estimate recorded only the range, the mid-point of that range was used as the count. For example '150' was used for a recorded range of 100-200 plants. When an estimated range was >800, '800' was used. Any subpopulation with fewer than 3 years of data, and any species with fewer than three subpopulations, was excluded. Linear regressions were run at the subpopulation level for those that fulfilled these criteria, and then an average slope (rate of change) was calculated for each species represented by the qualifying subpopulations. Populations that had an R-squared value below 0.30 were excluded since they did not fit a linear model and results from this test would not be robust. Note that a positive linear rate of change may not be the best measure of subpopulation health for all species and subpopulations. For instance, a population whose rate of change is near zero may be maintaining ideal population health if population size and measures of reproduction are vigorous. However, a high rate of increase or decrease may indicate an important trend.

Twenty species were ultimately involved in the analysis and, notably, none were shown to be decreasing although those at the bottom had low rates of increase (Table 6).

Table 6. Linear rate of change for 20 analyzed species from region-wide POC data.

species	Status	mean slope	mean R ²	# subpops
<i>Ammophila breviligulata</i>	E	1136.45	0.50	3
<i>Hypericum kalmianum</i>	E	777.15	0.64	3
<i>Rubus pubescens</i>	T	231.76	0.35	5
<i>Carex crawei</i>	R	143.92	0.48	3
<i>Sarracenia purpurea</i>	E	98.02	0.45	4
<i>Carex aurea</i>	T	56.71	0.57	4
<i>Dalea foliosa</i>	E	36.46	0.47	4
<i>Lathyrus ochroleucus</i>	T	31.00	0.56	7
<i>Viola conspersa</i>	T	27.89	0.50	15
<i>Besseyia bullii</i>	T	24.24	0.38	3
<i>Cirsium hillii</i>	R	14.47	0.65	11
<i>Polygonatum pubescens</i>	E	14.07	0.32	3
<i>Tomanthera auriculata</i>	T	13.96	0.36	7
<i>Mitella diphylla</i>	R	13.59	0.51	5
<i>Cypripedium candidum</i>	T	13.53	0.48	41
<i>Oenothera perennis</i>	T	13.26	0.63	8
<i>Ranunculus rhomboideus</i>	T	9.56	0.32	4
<i>Rubus odoratus</i>	E	6.28	0.58	3
<i>Sisyrinchium montanum</i>	E	3.33	0.40	3
<i>Triglochin palustris</i>	T	0.84	0.42	4

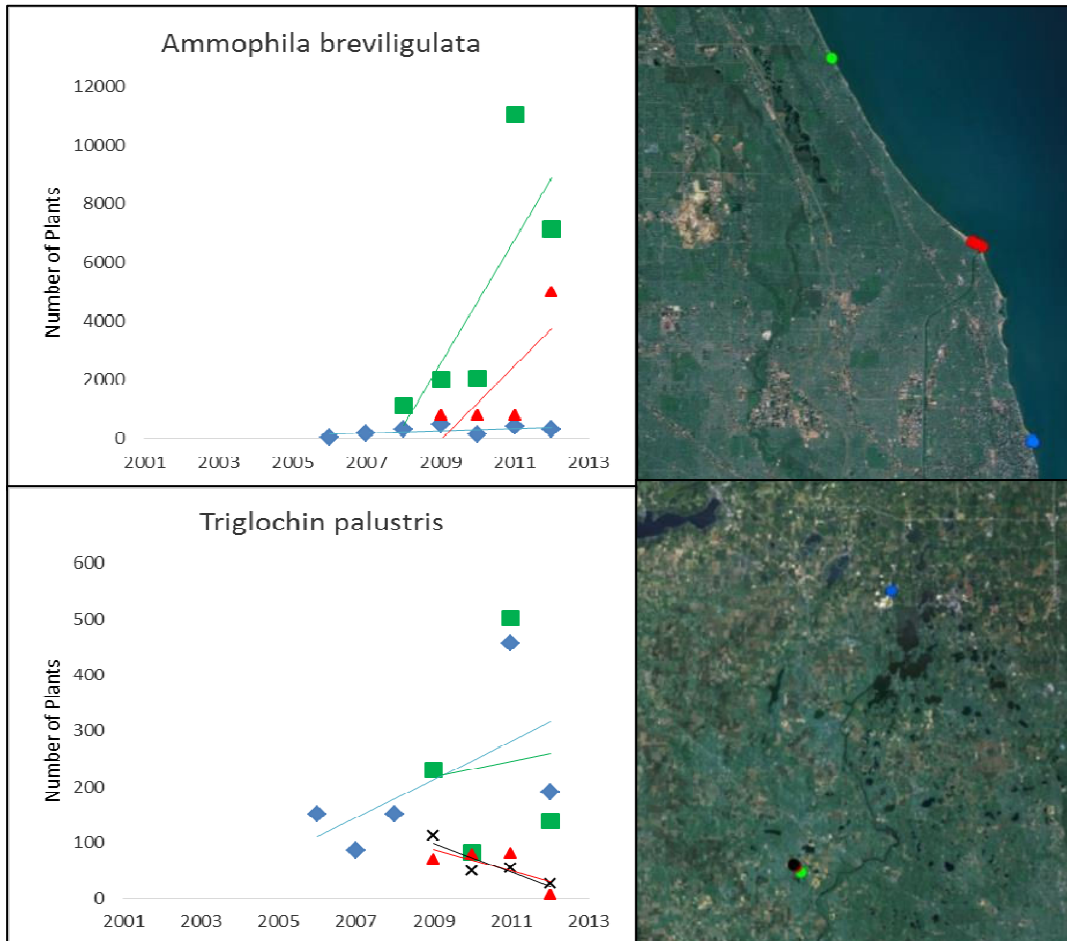
Notably, two of these species have been proposed for removal from the Illinois Endangered and Threatened Species list (ET list): White Lady's Slipper (*Cypripedium candidum*) and Small Sundrops (*Oenothera perennis*). POC data for the former is particularly robust, with 41 subpopulations, on average indicating an increasing trend. Two species on this list have been proposed to be downgraded from Endangered to Threatened on the ET list: Marram Grass (*Ammophila breviligulata*), and Downy Solomon's Seal (*Polygonatum pubescens*). Marram grass by far showed the highest rate of increase, supporting this decision. However, habitat for this species is limited, arguing for continued conservation focus on this species and its maintenance on the ET list. These decisions show that POC has been able to provide valuable data for use in these important

decisions, and the removal and downgrading of species from the ET list when in response to robust population metrics should be viewed as a success.

However, additional information about species ecology and the spatial distribution of populations provides critical context for these results. For instance, Pitcher Plant (*Sarracenia purpurea*) appears as the species with the fifth highest rate of increase, but this species is restricted to bogs, a very rare and threatened habitat in Illinois (Fink, 2012). Additionally, Leafy Prairie Clover (*Dalea foliosa*), a federally endangered dolomite prairie species, is also on this list although half of the subpopulations monitored are introductions and dolomite prairie habitat is in itself rare. While these are positive metrics, this contextual information suggests that the health of these populations should continue to be of concern.

Further, the extent to which these results represent region-wide trends in rare species is a function of the spatial distribution of populations. The most robust understanding of whole-region trends would result from species that have multiple randomly distributed populations around the region, but this is often not the case with rare species. In addition to spatial distribution, individual subpopulations may exhibit vastly differing trends, making a region-wide trend difficult to discern. Figure 6 shows an example of how these factors play out for the species with the highest (*A. breviligulata*) and lowest (*T. palustris*) increases. The former has three populations that were included in the analysis, each of which is distributed along the lake front, and all show an increasing trend. The latter has four populations, of which three are at the same site. Two are increasing and two are decreasing. The *T. palustris* data may have resulted from site-specific rather than region-wide factors. More complex statistical models may be able to take these challenges into account.

Figure 6. Results from analysis of three subpopulations of *Ammophila breviligulata* at three sites, and from four subpopulations of *Triglochin palustris* at two sites in northeastern Illinois. The map to the right of each graph represents the location for each subpopulation included in the analysis. Each color represents a separate subpopulation (dots and lines on graph, dots on map).



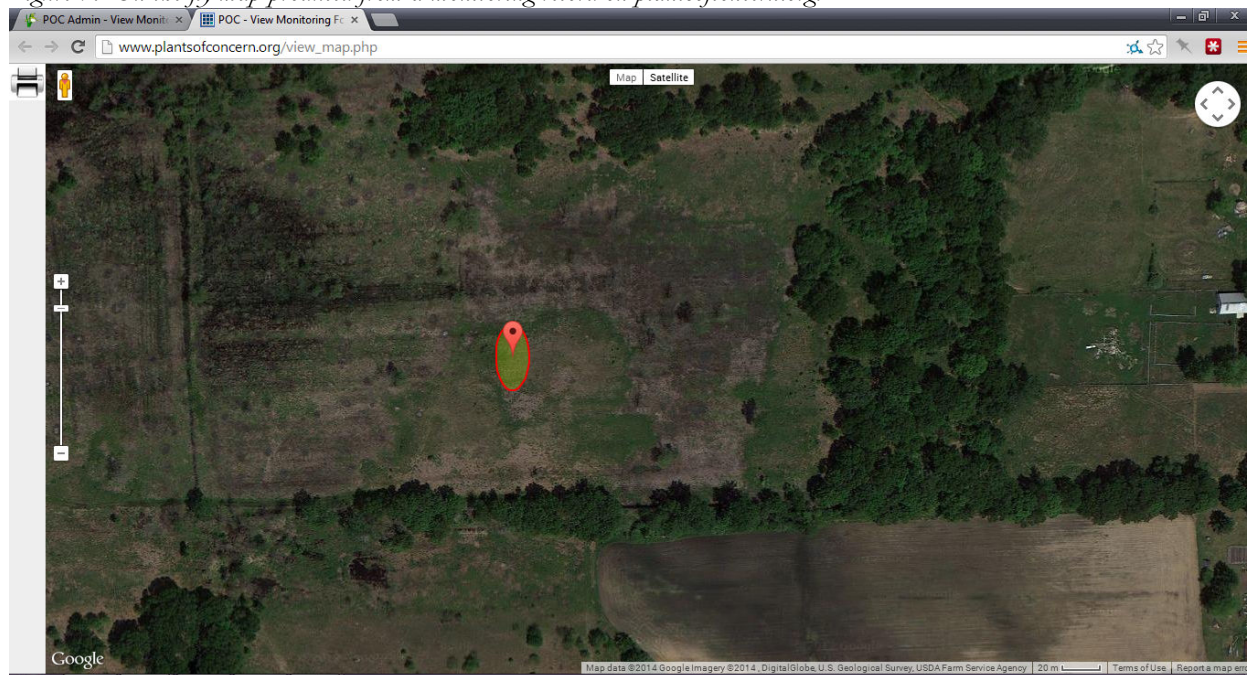
Level 1 spatial data

Considerable progress was made this year with POC spatial data. The transition to a spatial database makes POC point data more easily accessible, and as such, we are now able to error-check GPS records more easily. Volunteer Rob VanDaal worked with 1006 records identified with potential errors (these represent less than 5% of all records). He corrected 370 records. Some of these were recorded in the wrong coordinate system, others had numbers switched (e.g., 42.39356 instead of 42.93356), and others were simply transcribed incorrectly from the paper form. Detailed notes were kept about errors found and solutions implemented. Further, a GIS service –learning project was taken on by a class from Northeastern University in early 2014. Their task will be to identify any additional errors remaining and to verify that datum and coordinate system conversions within our database are accurate.

An important goal is converting point data, which may consist of 5 separate point records for each subpopulation (North, South, East, West, Center) into a single polygon shapefile that can be attached to each monitoring record. Our goal is to create a process that automatically turns volunteer-input point data into a polygon that is stored in the database. However, this process has proven difficult given the different combinations of points currently in our database. We continue to work towards this goal. Once accomplished, we will be able to share polygon shapefiles with all associated POC data with land managers. Notably, the intern dedicated to Forest Preserve District of Cook County (FPDCC) has been able to do this manually for the second year in a row, providing FPDCC with GIS polygons of all monitored species in the district to assist with their management planning.

Another important milestone reached this year is ‘on-the-fly’ mapping through our website based on monitoring report data. These ‘on-the-fly’ maps project a center point (averaged from all GPS readings on the report) surrounded by an ellipse whose axes are defined by north-south and east-west population distances supplied in the report (Figure 7). Unfortunately, this process is completed with GoogleMaps API and the coding necessary to complete it is different from that which is required by our database.

Figure 7. On-the-fly map produced from a monitoring record on plantsofconcern.org.



Land Management Reports from Managers

Since 2002, POC has asked land managers to complete Land Management (LM) forms to supplement monitoring reports submitted by volunteers. (Attachments 3a, 3b, 3c). LM forms provide more detail on the types of management that take place both within the populations and onsite, as well as land use history. While managers report activities in the area or management unit where the populations occur, monitors often have a more precise understanding of how management affects specific population areas. Therefore, the two reports serve to complement each other.

POC requests that the first LM report include land use history, general management history prior to monitoring, information about adjacent land use, and whether a population has been introduced for each subpopulation. Annually, queries are conducted for population and site management during the past year, including burning, mowing, invasive species management, and deer removal. POC no longer asks for hydrological conditions such as drought or flooding, as these data can be derived from other sources. As data accumulates, the cycles of land management can be compared with population cycles in order to uncover the influence of management on the plants of concern.

All LM reports submitted through 2009 have been entered into the database, while 2010-2012 forms are still being entered. The switch to the relational mySQL database halted LM data entry during 2011, resulting in a backlog. POC staff has undertaken a concerted effort to gather LM reports and offer land managers alternate methods of completing the information, including an Excel spreadsheet using a single form for multiple species within a management area. Starting in 2012, online submission for LM reports was initiated. Cumulatively, POC has entered at least one report for 760 subpopulations or 44 % of the total subpopulations monitored in the database. Of forms entered in 2011 and 2012, 79% were entered online.

There are admittedly gaps and issues in the LM portion of the program. For example, some managers have commented that completing additional forms is challenging in light of their other responsibilities. To address this issue, managers and POC staff have discussed the possibility of having monitors who are also stewards complete the LM form and submit to the manager for final review. Some managers have already taken advantage of this steward submission alternative. Additionally, POC has not yet conducted an analysis of the management data from LM forms due to limited staff resources and ongoing program priorities. It is the hope of POC to attract other researchers or graduate students to examine closely the patterns being reported about management within populations. Meanwhile, continued collection of management data is imperative.

In addition to the management data recorded in the appropriate fields on the Level 1 reports, POC is aware of numerous and significant management responses to reports through anecdotal sources such as email correspondence, notes on the reports, and personal communication. Below are only a few examples among many POC can provide:

- At Deer Grove East in Cook County, an endangered species (*Geranium bicknellii*) was discovered by a volunteer and identified by Stephen Packard and Daniel Suarez, POC assistant for Cook County. The volunteer ensured protection of by caging— at her own expense - the four plants at this new Element Occurrence location. This will help to protect them from deer browse, to which this species is prone. The volunteer also became a POC monitor in the process and will be checking for additional plants in 2014.
- At Harms Flatwoods in Cook County, subpopulations of a threatened species (*Rubus pubescens*) are threatened by encroachment of dense stands of ash saplings resulting from the death of mature trees infected by the Emerald Ash Borer. The POC volunteer monitor pointed out this situation to the steward who, with a map provided by GPS coordinates, plans to remove the saplings over the 2013-2014 winter season.
- In Will County, POC staff and volunteers worked with land managers to monitor several species at two different preserves, Lockport East and Sand Ridge Savanna, which support populations of an

extremely rare and endangered species (*Isoetes butleri*), and two other listed species (*Hypericum adpressum* and *Platanthera flava* var. *herbiola*). During these monitoring efforts, management strategies were discussed by the managers and POC staff, and several actions subsequently followed or were planned. Buckthorn was removed from the population at Lockport East which had been flagged to indicate boundaries to the contractors, and a decision was made to remove numerous, overabundant *Quercus velutina* pole trees that were over-shading the populations at Sand Ridge Savanna. This kind of on-site interaction not only provided accurate management information for POC reports but also demonstrated the feedback loop between POC data and land management decisions - a primary goal of the program.

- In McHenry County, several species are monitored along prairie remnants on the HUM right-of-way, managed by MCCD. One endangered species increased from a single plant observed in 2012 to 164 plants in 2013, in response to burning the previous fall. This was the largest number recorded since POC monitoring began in 2005, as well as the first burn conducted during that time frame.
- In DuPage County, a POC volunteer reported vehicle tracks running through a population of the threatened *Tomanthera auriculata*, near where contractors were herbiciding invasive shrubs at a DuPage FPD site. She immediately reported this disturbance to the FPD volunteer coordinator who in turn contacted the management staff person working with the contractor. He investigated the site the next day to view the damage with the contractor, who investigated the occurrence with his crew and assured the FPD they would keep vehicles out of the population area. Although it was not clear that the work crew had done the damage, or whether other vehicle trespass had taken place, the communication and follow up occurred within three days, thanks to the vigilance of the POC monitor and the accountability assumed by the FPD staff.

Research Outgrowths of POC Data

With a growing Level 1 data set and the involvement of the joint Chicago Botanic Garden-Northwestern University graduate program, University of Illinois at Chicago, and Loyola University, POC has seen an increased potential to attract graduate students and other researchers to assist with data analysis. These resources can allow POC to gain more information from the data than staff members are able to undertake.

- ***Asclepias lanuginosa***

A proposal by Dr. Jeremie Fant (Chicago Botanic Garden) and Dr. David Zaya and Masters student Eun Sun Kim (University of Illinois – Chicago) was approved and funded in 2011 by the Illinois Endangered Species Protection Board to examine pollinator limitation, fruit production/viability and genetic diversity in populations of *Asclepias lanuginosa* that have not produced fruits in many years of monitoring. Pollinator observations and comparisons of seed-set to co-occurring *A. viridiflora* indicated that pollinators were not limiting. Genetic analysis revealed a high degree of clonality within populations, which likely prevents successful pollination and therefore fruit set. The authors of this study recommend that any recovery plan for this species includes genetic augmentation and/or reintroductions to prevent the loss of this species from Illinois. Importantly, results from genetic studies indicated that *A. lanuginosa* was unlikely to be impacted by outbreeding depression. As part of the reintroduction and genetic augmentation trials, eight plants were planted at a Cook County hill prairie site and eight at a McHenry County hill prairie site. By placing presumably unrelated plants from Wisconsin in the vicinity of other Illinois sites, the team hopes to test for self-incompatibility in situ. As these plants will presumably represent genetically novel genotypes, they are likely to be receptive to Illinois pollen. If seed pods form in the presence of these new genotypes, this will provide evidence that self-incompatibility, and not pollen limitation or pollinator declines, is the reason for the poor sets. Additionally, two experimental populations were introduced at the Chicago Botanic Garden. While the project was completed in February 2013, the introduced plants were monitored in 2013 with the following results: at the Cook County site, two of eight plants were recovered; one had bloomed but flowers were lost; at the McHenry County site, three of 8 plants were recovered; two of these had aborted blooms; at Chicago Botanic Garden, no plants were recovered. These sites will continue to be monitored in 2014 and future years to determine success of this project.

- ***Cirsium hillii***

Dr. Jeremie Fant has completed seed viability analysis (2010-2012) on all level 2 populations of *Cirsium hillii* that had produced seed (Grant Creek, Lyman Woods, Dixie Briggs Fromm and Lake in the Hills). The number of viable seed was determined by seed weight and then confirmed with germination studies. The numbers of flowering plants and viable seed per flower were low for most locations. The number of healthy seeds in most maternal lines was very low (1-10 viable seeds) with the exception of one plant from Lyman woods (31 viable seeds) and one from Lake in the Hills (89 viable seeds). The resulting plants were offered back to all land managers to be used for restorations on their own property, but most were donated back to the project for restoration purposes. Restorations were conducted at six sites: in fall 2011 plugs were planted at Gander Mountain (30 Plants), Chicago Botanic Garden (25 plants), Spring Bluff Fen (15 plants), and at Midewin National Tallgrass Prairie (30 plants). In fall 2012 plugs were planted in Indiana (31 plants) and additional plants were provided for a seed bed at Midewin. Finally, plugs were planted at Dixie Briggs Fromm in fall of 2013. In all cases plants came back in high numbers the year following planting. Unfortunately the subsequent year (2012) was one of the hottest springs on record, and many of the restored plants were clearly stressed. Most of these plants did not show high returns in 2013. It is uncertain if those plants went dormant due to stress from previous growing season or had died. Monitoring will aim to determine this in 2014.

- ***Isoetes butleri***

Erin Vander Steldt completed her Masters thesis, for the joint Northwestern University and Chicago Botanic Garden Program in Plant Biology and Conservation, in 2013. In “*Isoetes butleri* Engelman: Genetic, Environmental, and Ecological Characteristics of Illinois Populations” she worked with POC to census four (of five) extant populations in northeast Illinois, all occurring in the rare dolomite prairie system along the Des Plaines River. Through DNA analysis, she investigated genetic structure between and within populations and found all populations showed high genetic diversity and high inbreeding coefficients which may reflect the relative isolation of groups within populations from each other in disjunct moist depressions. There were no significant differences in soil nutrient availability among populations, and most areas inhabited by *I. butleri* had a lower abundance of woody species and higher abundance of conservative species than did areas uninhabited by *I. butleri*. Experimental litter removal in one population resulted in higher population numbers the following year. Management recommendations included removal of woody species and prescribed fire.

- ***Melanthium virginicum* and *Malvastrum hispidum***

Dr. David Zaya from the Illinois Natural History Survey contacted POC in 2013 for permission to access data on these species. POC obtained permission from landowners and had him sign an official POC Data Request Form (Attachment 11). Dr. Zaya intends to publish the results of a proposed reproductive biology study of *M. virginicum*, and plants to submit this to the Endangered Species Protection Board as part of a recovery plan (not yet written for this species). He is using POC data on *M. hispidum* to assist him in conducting preliminary inquiries into ploidy and reproductive biology of different populations.

- ***Sarracenia purpurea***

Dan Fink completed his Masters thesis for Northeastern Illinois University, Department of Geography and Environmental Studies, in 2012. In “The Geographic Distribution of *Sarracenia purpurea* in Illinois and its Associate Species” he definitively located, mapped and censused the five remaining populations in Lake and McHenry Counties and determined that three other historic locations are now extirpated. He also recorded threats to the populations, including those to the species’ rare bog, fen and marsh habitats. All data were reported to respective land managers. In addition, his discussion of the morphological differences in plants between populations suggested the occurrence of multiple ecotypes that might be substantiated through genetic analysis.

- ***Spatial data analysis***

Another example of the expanded applications of POC data is the increased use of GIS in POC monitoring. Land managers and conservation organizations increasingly use spatially referenced data to answer ecological questions, and with the creation of the GIS lab at CBG in 2009, POC's capacity to collect, organize, and analyze spatial data has also increased. GPS coordinates of all POC subpopulations are routinely recorded and program staff are adding GPS polygons of many populations. POC has worked with two REU (Research Experience for Undergraduates) students on spatial analysis of POC data. In 2012, Hazel Levine examined spatial distribution of *Oenothera perennis* over time, and assisted with the transition to the spatial database. Chris Wright, REU student for POC in 2013, completed a GIS-based spatial analysis of rare gravel hill species *Cirsium hillii* and *Asclepias lanuginosa*. He developed a Multi-Criteria Evaluation model to characterize the habitat of known populations and identify potential suitable habitat (where rare plant species may occur or where they may be appropriately reintroduced) using POC data. By extracting data relating to soil attributes, land cover, hydrology, and distance metrics, gravel hill prairie habitat was classified and models were generated to identify suitable habitat based on variable weighting structures. Using the greater Chicago area as the study area extent, six models were produced identifying varying amounts of highly suitable ($\geq 90\%$) habitat. High suitability areas ranged from 5.6 to 117 km². Thirteen natural areas with occurrences of one or both of these species were analyzed and suitability scores compared. Suitability scores ranging from 20-100% were reported from the six models. The modeling resulted in comparable suitability scores for each natural area regardless of the model chosen. Ground-truthing and additional refining of his model will occur as resources allow.

LEVEL 2 DEMOGRAPHIC MONITORING UPDATE

Level 2 demographic monitoring of four species (*Viola conspersa*, *Cypripedium candidum*, *Cirsium hillii* and *Tomanthera auriculata*) was initiated in 2001, and includes tagging individual plants in permanent plots in order to track them over time. In the case of the annual species *Tomanthera auriculata*, plants are newly tagged each year and are followed from flowering to fruiting stages. Specific protocols vary by species, but plant height, leaf measurements (width or length), number of blooms, and seed set are common measurements. In 2012 and 2013, POC staff and volunteers conducted monitoring of all these species except *Viola conspersa* because Chicago Botanic Garden scientist Pati Vitt had previously reached her research goal of collecting 11 years of demographic data needed for population modeling. 2013 marked the end of the Level 2 demographic work, with at least 12 years of data accumulated for each species. In 2012 and 2013, five and six plots of *C. hillii* were monitored, respectively, seven and six plots of *C. candidum* were monitored, respectively; and five plots of *T. auriculata* were monitored in both years. Researchers and graduate students will continue to work with the accumulated data. In particular, Ann Nies, Northwestern University-Chicago Botanic Garden Masters student, is researching mycorrhizal relationships in populations of *C. candidum*. She is researching whether populations associate with different fungal species, and the degree to which fungal interactions affect population dynamics.

PROGRAM EVALUATION

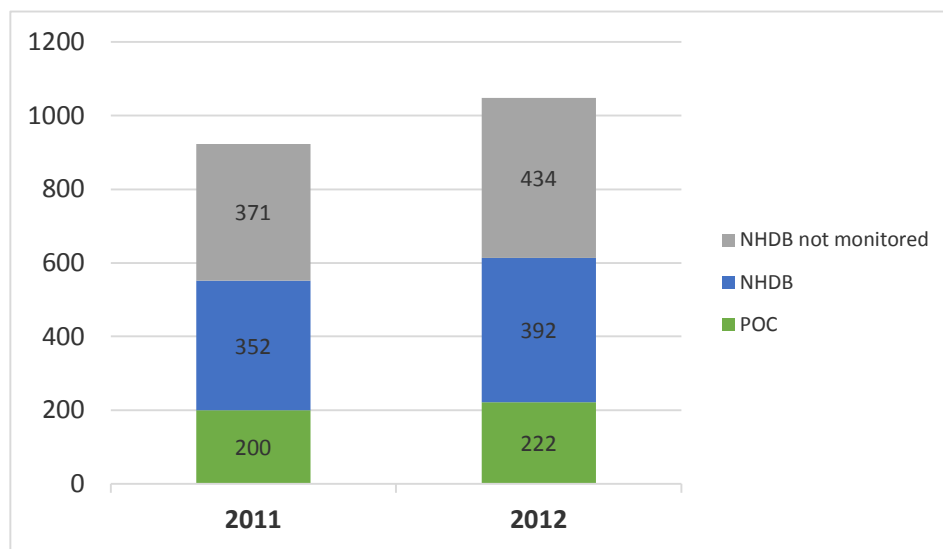
POC met or greatly exceeded nearly all the program objectives as outlined in the WPF proposal and listed below. Most have already been discussed in detail in the preceding text.

Objective 1: *Collect standardized monitoring data on rare plants (population size, location, threats, and management) on a cumulative 68% (increase of 4%) of northeast Illinois' Element Occurrences (EORs) of listed species. More detailed demographic data will also be collected in selected populations of *Cypripedium candidum*, *Cirsium hillii* and *Tomanthera auriculata*.*

From 2001-2012, POC had collected standardized monitoring data on a cumulative 651 EOs of threatened or endangered plant species in seven northeast Illinois counties. Of these, 37% (392 of 1048) have been issued an EO number by the Natural Heritage database. Notably, these 392 EOs correspond to 429 EOs

monitored by POC, since POC may monitor multiple EOs that are considered a single EO by IDNR. An additional 222 EO's are monitored by POC that have not yet been issued an EO number, bringing the estimated percentage of EOR's monitored to 48%. This number is lower than that reported previously due to the difficulty in aligning IDNR and POC EO numbers, though it represents an 11% increase from 2011 (Figure 8). Through 2012, POC monitored 72% of the 182 listed species in the Natural Heritage database for the seven counties of northeast Illinois.

Figure 8. The number of cumulative* EO's monitored by POC with no assigned EO number (POC), those that are monitored by POC and have an EO number from the Natural Heritage Database (NHDB), and the remainder of EO's in the Natural Heritage database that POC does not yet monitor (NHDB not monitored) for 2011 and 2012.

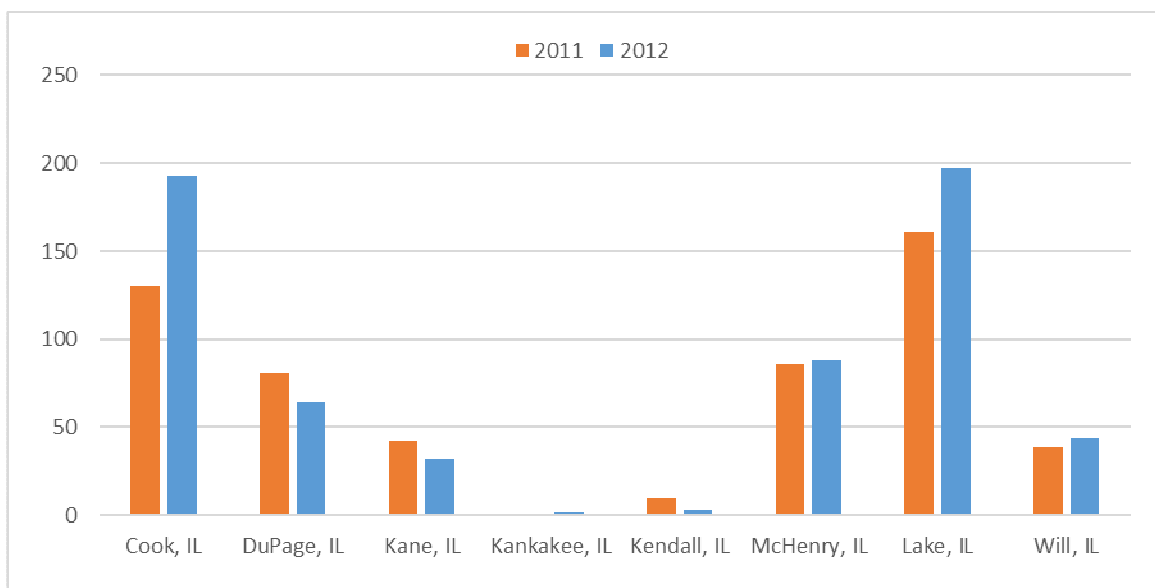


*These numbers reflect the cumulative EO's in POC's database in each year, not the number monitored in each year.

In 2012, POC collected standardized monitoring data on 89 endangered and threatened Illinois species in 336 EOs (from 90 species in 372 EO's in 2011) and 78 rare, non-listed species in 203 EOs (from 88 species in 181 EO's in 2011). Monitored EOs increased from 2011 occurred primarily in Cook and Lake Counties as a result of a specific POC focus in those areas (Figure 9). Declines shown may be due in part to the fact that some occurrences are being monitored in alternate years.

Figure 9. Change in monitored element occurrences in eight Illinois counties. Note that different EOs may be monitored from year-to-year.

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In 2012 and 2013, POC collected demographic data on seven and six plots of *Cypripedium candidum*, respectively, five and six plots of *Cirsium hillii*, respectively and five plots of *Tomanthera auriculata* in both years.

Objective 2. *Educate adults about rare plants and rare plant monitoring by holding four volunteer training workshops and further supporting volunteers with training in the field. The Garden will also attempt to increase the number of volunteers recruited in cooperation with landowners (approximately 30 new individuals across the region) for a total of more than 200 active volunteers projected in 2012.*

In 2012, 72 volunteers attended four training workshops, which took place at Brewster Creek Lodge (Kane County), Lost Valley Visitor’s Center at Glacial Park (McHenry County), Sand Ridge Nature Center (Cook County), and the Jack Benny Center at Bowen Park (see Attachment 8 for Workshop Agenda). POC staff mentored volunteer monitors frequently in the field, and also held several group monitoring “forays”, which were excellent mentoring opportunities in protocol usage and plant identification. In 2013, 70 volunteers attended four training workshops which were held at the Chicago Botanic Garden (Cook County), the Volunteer Resource Center (Cook County), the visitor’s center at Midewin National Tallgrass Prairie (Will County), and Hopkins Park Village Hall (Kankakee County). The Kankakee workshop was held in June and aimed at engaging a volunteer base specific to the Kankakee Sands region.

Our goal of over 200 volunteers participating in POC was met in 2012, with 234 total participants, 58 of these being new recruits. There was an average of 8.3 new volunteers across seven northeast Illinois counties. All counties except for Kankakee and Kendall recruited seven or more new volunteers. On average, Illinois counties (excluding Kankakee) gained ten new volunteers in 2012. High levels of retention increase data reliability. The volunteer retention rate from 2011 to 2012 was 61%, and of the 234 volunteers who monitored in 2012, 131 had monitored for three or more years (56%). See Table 4 for the change in total monitors from 2011 to 2012 in northeastern Illinois Counties.

Table 4. Percent change of the number of volunteer monitors in Illinois counties with Plants of Concern involvement.

Year	Cook	DuPage	Kane	Kankakee	Kendall	Lake	McHenry	Will
2011	89	30	38	2	7	66	37	29
2012	78	25	32	0	6	60	45	27
% Change	-12%	-17%	-16%	-100%	-14%	-9%	22%	-7%

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The decline in total volunteer monitors was in part explained by the difficult weather in 2012. Altered bloom times early in the season caused some monitors to miss the window for monitoring, and extreme heat later in the season was prohibitive for some monitors. Although the percent change in Cook County was negative, POC has made great progress with the Forest Preserve District of Cook County with the creation of a POC internship to act as liaison to volunteers and staff. In 2012 in Cook County, 17 new volunteers were engaged and the number of monitored EOs increased significantly, in large part due to this new intern. Overall, new volunteers continue to join as evidenced by the 72 attendees at 2012 workshops, and 70 attendees in 2013. The drop in volunteers monitoring in Kankakee County was bolstered by a workshop focused on training monitors in that area in 2013.

Objective 3. *Collaborate with public and private landowners to retain current participants and recruit new ones into POC and place volunteer monitors on their sites. POC will in particular collaborate with the IDNR (Regional Biologists, Natural Heritage Database, Nature Preserves Commission, and Illinois Endangered Species Protection Board). Also encourage major landowners to access and use the extended datasets made available to them for the first time through the online POC database.*

In 2012, POC worked with 72 public and private landowners to prioritize species and to place volunteer monitors at their sites. During the winter of 2012, POC held planning meetings with six Forest Preserve District staff and IDNR's Brad Semel, to discuss the 2012 season volunteer assignments. Other landowners in the program and four site superintendents at IDNR-owned sites, were contacted through email and by phone to plan the 2012 monitoring season. (See attachment 6 spreadsheet for partner landowners.) Similar meetings were held in 2013.

POC continues to have a strong relationship with IDNR staff. For example, POC collaborated at Illinois Beach State Park in 2012 and 2013 with Heritage Biologist Brad Semel and held planning meetings regarding monitoring assignments at Illinois Beach State Park, Volo Bog, Moraine Hills State Park, and Chain-o-Lakes State Park. Semel received all 2012 monitoring reports for his sites, which he has used in management planning, and currently has web access to all reports for his sites. Semel also serves on the POC Advisory Group. In 2013, Duane Ambroz, who served at IBSP as the Illinois Coastal Management Program staff person, was actively involved in POC monitoring at that site and in the Waukegan area buffer to IBSP. Don McFall, Division Chief, Natural Heritage, is invited to Advisory Board meetings and is kept apprised of POC progress. Heritage Biologist Dan Kirk received all reports on sites within his region: Grant Creek Prairie, Blodgett Road Dolomite Prairie, and Des Plaines River Conservation Area. Region 4 Administrator Maggie Cole has access to the POC database for all IDNR sites in her region and in 2012 she assigned several interns to monitor species at Hitts Siding and William Powers Conservation Area. Joe Kath, Endangered Species Project Manager and his assistant Jennie Skufa, have also been included in POC correspondence and invited to the Advisory Group meeting. POC submitted all EOR reports for listed species to the Illinois Natural Heritage Database in 2012.

POC submitted permit applications and follow up monitoring reports for the 2012 monitoring season to the Illinois Nature Preserves Commission (INPC). Kelly Neal, Stewardship Project Manager for the Commission, also serves on the Advisory Group. POC also applied for permits on IDNR-owned sites to Mike Moomey, Assistant Chief, Natural Heritage. In addition, POC has occasional contact with INPC Field Representatives Steve Byers and Kim Roman over issues that arise in monitoring at sites within their regions. Kim Roman also serves on the Advisory Group. (See attachment 10 for IDNR and Nature Preserve Sites monitored.)

John Wilker, Program Manager, Division of Natural Heritage, IDNR sponsor of the WPF POC grant, is a strong supporter of the POC program.

Susanne Masi, POC manager, is an appointed member of the Illinois Endangered Species Protection Board and brings information about listed species from POC monitoring to the group. She also serves as a Technical Expert Consultant for the 2014 listing of endangered and threatened species. Board Chair Dan

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Gooch also serves on the POC Advisory Group. It is worth noting here that the 2014 five-year listing process currently underway with the Board has extensively utilized POC data from northeast Illinois. Partially as a result of these data, 16 POC-monitored species will either be delisted, added to the list, or undergo status changes.

Objective 4. *Hold an advisory group meeting to assess progress and determine whether any changes should be made to the program.*

Advisory Group meetings were held on December 6, 2012 and on December 13, 2013. Minutes for each of these meetings are found in Attachment 9a and 9b.

Objective 5. *Record, organize, analyze, interpret and disseminate the collected data to better understand the state of rare plants in the region. POC will share the data by April of 2013 with state agencies and landowners that include management impacts on populations or concerns about the absence of management.*

The first step in data management involves recording, organizing and disseminating POC monitoring reports. 2012 data have been shared with partner landowners and submitted to the Natural Heritage Database (for listed species) and to the Nature Preserves Commission (for plants monitored at Nature Preserve sites). In addition, landowners, Heritage Biologists and the Regional Administrator have ongoing access to the POC database through the POC website. This report, which includes the next step of data and program analysis and interpretation, will be shared with the Chicago Wilderness Natural Resource Management Task Force. POC is a priority project for that group and enjoyed funding support from Chicago Wilderness through its former grant program for eight years. With permission from IDNR, this report will also be shared with partner landowners and members of the Advisory Group.

Examples of analysis and interpretation of POC data are provided in this report and more have been included in the presentations and posters that have been created for outreach and communication at various venues. As presented in this report, graduate students and other researchers have conducted and published research using POC data.

Objective 6. *Expand the impact of POC by exploring with IDNR staff the possibility of exporting the program to another urban center of Illinois. The Garden will also communicate the POC program to a broader professional and volunteer audience through participation in a regional or national conference and by collaborating with the USFS to expand the use of POC monitoring protocols and methodology nationally.*

As discussed in previous reports for the WPF grant, POC had discussed with Karen Tharp (Illinois Nature Conservancy Volunteer Stewardship Network) the possibility of exporting the POC program to southern Illinois. However, Tharp's original plan to use an AmeriCorps volunteer to help establish the program did not materialize. In 2012, POC continued discussions about expanding into southern Illinois with the Plant Biology Department (PLB) at Southern Illinois University in Carbondale, and with the southern chapter of the Illinois Native Plant Society (SINPS). Dr. Stephen Ebbs, interim chair of PLB at Southern Illinois University visited the Chicago Botanic Garden (CBG) in 2012. POC staff and Greg Mueller, Vice President of Academic Affairs at CBG, met with him to discuss possible collaboration on the POC program, engaging professors, graduate students, and classes. While no specific plans have been determined, there does still appear to be interest within the PLB Department. There is also interest outside of SIU in southern Illinois. Rachel Goad was invited to speak to SINPS in November of 2012 about POC. There were 20 attendees who enjoyed the presentation about POC and the rare flora of northeastern Illinois.

Finally, efforts to expand the program within Kankakee County in the Kankakee Sands area bore fruit in 2013. A training workshop specifically targeting volunteer interested in POC monitoring in the Kankakee Sands area was held on June 15, 2013. POC has been in positive discussion with The Nature Conservancy's Rob Littiken, land manager at Pembroke Savanna and other sites in the region, about bringing the program to

the area. This effort resulted in the addition of 14 endangered, 2 threatened, and 7 rare species, 10 of which are totally new to the POC database. This significant addition of data contributes to a greater understanding of this ecologically significant area, and provides important information for conserving its rare flora.

There has been no attempt to establish POC in other parts of Illinois, though IDNR has suggested POC pursue the St. Louis area. An interested local leadership, such as that displayed by Karen Tharp, and an adequate level of funding are needed to initiate this expansion. With current staffing and funding levels, the present POC program based in the Chicago region is performing at maximum capacity in terms of volunteer training and support, active monitoring and landowner communication.

Within the Chicago region itself, the program has created active spinoffs that enhance the overall value of POC and at the same time, provide focus to targeted areas having rich flora and excellent restoration potential. POC's Midewin National Tallgrass Prairie rare plant monitoring program has been in place through a cost share agreement with the US Forest Service continuously since 2003. A second offshoot is the monitoring along the lakefront and rare ravine ecosystems of Lake Michigan in Lake County through several separate, but related programs. POC has monitored at the Ft. Sheridan ravines and lakefront since 2003, through a partnership with the Lake County FPD and at McCormick Ravine since 2008, through collaboration with the Lake Forest Garden Club and the Lake Forest Open Lands Association. Since 2010, POC has worked at the Openlands Lakeshore Preserve in Highwood through a partnership between the Chicago Botanic Garden and Openlands designed to develop a comprehensive monitoring program to track and guide management. Further expansion of ravine monitoring to the Waukegan area occurred in 2012 and 2013 through a grant from the Great Lakes Restoration Initiative (GLRI) to the Waukegan Harbor Citizens' Advisory Group, who subcontracted POC to do rare plant monitoring and volunteer training. The Waukegan area is considered a buffer to Illinois Beach State Park. Another ravine monitoring project for 2012 and 2013 through a subcontract on a grant from Sustain our Great Lakes (National Fish and Wildlife Foundation) awarded to the Alliance for the Great Lakes for a Northeast Illinois Ravine Restoration and Monitoring Program. POC conducted comprehensive rare plant monitoring and mapping for this project at Ft. Sheridan. Other ravines to the south are already monitored through POC's existing program and the lakefront is monitored through the north suburbs and the Chicago lakefront. Thus, POC ravine and lakefront monitoring extends from Illinois Beach State Park to the Indiana state line.

POC has also had an impact beyond the Chicago region. POC staff were consulted about its program structure, protocols, and volunteer component by Dr. Steve Young, Chief Botanist for the New York Natural Heritage Program (The Nature Conservancy -Albany) and Coordinator of the Long Island Invasive Species Management Area. New York wishes to create a similar program and, if funded, will model it in part after Plants of Concern. The Nature Keep Conservation Group in the Barnveld-Blue Mounds region of southwest Wisconsin has been using an adapted version of POC protocols on privately owned conservation sites and Wisconsin DNR or land trust-owned sites. In 2013 they worked with multiple landowners, 26 volunteers and with Wisconsin DNR staff on 14 sites.

In August 2012, Susanne Masi and Rachel Goad co-authored a poster on POC and citizen science presented at the first stand-alone conference on Public Participation in Scientific Research (PPSR) in Portland, Oregon. This involvement was followed by an invitation to Susanne Masi to present POC as a model citizen science program in a symposium dedicated to PPSR at Botany 2013 in New Orleans in July, 2013. Also see listings below for additional regional or national presentations.

The collaboration with the USFS to expand the use of POC monitoring protocols and methodology nationally has been completed as of 2013. Research Assistant Melissa Tienes and Dr. Pati Vitt worked with Dr.s Kay Havens and Krissa Skogen to create two reports on Optimal Monitoring. The first part was a synopsis of monitoring methods and techniques and a decision matrix to help users determine the appropriate technique for their situation. The second part was a primer and protocol manual to applying those techniques with examples of field data collection and worked examples of analysis.

Objective 7. *Engage graduate students and other researchers in analysis and use of POC's long-term datasets.*

In 2012 POC engaged numerous students and researchers to work with POC data. Multiple students from the Plant Biology and Conservation program, administered collaboratively by Northwestern University and the Chicago Botanic Garden, as well as students from other universities (UIC and Northeastern Illinois University in particular) have worked with POC. Some of these include Anne Nies' work with mycorrhizae and *Cypripedium candidum*, Erin Vander Stelt's thesis on *Isoetes butleri* populations, Dan Fink's thesis on *Sarracenia purpurea*, and Eun Sun Kim's work on *Asclepias lanuginosa*. POC has also worked with REU (Research Experience for Undergraduates) students in 2012 and 2013. The REU program is funded by the National Science Foundation, and each year a number of students come to CBG to work on various research projects. These projects are discussed in greater detail in the Research Outgrowths section above.

CONCLUSION AND FUTURE DIRECTIONS

As this report demonstrates, Plants of Concern remains strong and continues to grow as an essential source of data on endangered, threatened, and rare plant species. The data serves land managers and the program engages trained volunteers. Volunteers make meaningful contributions to the regional understanding of rare plant populations, including factors that threaten them and management activities that sustain them.

Although in its infancy, the work initiated in Indiana and Wisconsin in an effort to export the program to the wider Chicago Wilderness regions has produced valuable baseline data that we can continue to work from. In Illinois, our diverse partnerships and program outgrowths attest to POC's influence and effectiveness, and collaborations with numerous students and researchers are leading to a greater understanding of the dynamics of rare plant populations. Critically, POC provides updated and valuable data to the Endangered Species Protection Board through the Natural Heritage Database which has been used in the 2014 listing process

Although 2012 was a challenging year, monitors visited more subpopulations in 2012 than in 2011, and all other measures of accomplishment were similar to those of 2010. We engaged over 200 volunteers in monitoring efforts across the region while also managing five separate program offshoots: Midewin, Cook County FPD, Openlands Lakeshore Preserve, Waukegan Harbor Areas of Concern, and the Northeast Illinois Ravine Restoration and Monitoring Project. In addition, considerable website and database development occurred in 2012 and 2013, and these critical infrastructure updates will allow further expansion of the website as a tool and resource. For instance, with development the website could be used to provide direct feedback to monitors and land managers, allowing monitors and managers to see basic analysis of data they have collected over time.

With Susanne Masi's retirement in 2013, Rachel Goad is now managing the program. Goad has been Research Assistant for the program for three seasons and has a strong grasp of program goals and processes. She will continue to build partnerships with ecologists, land managers, agency staff, and volunteers to accomplish the goals of the program. Systematic evaluation and analysis of the data are increasingly important, and resources will be specifically targeted to allow us to address this goal.

At present, the POC data reservoir is very large, housing 13 years of monitoring data, and examples of how the data can be analyzed are presented in this report. POC is making significant progress in its capacity to use GIS to show spatial relationships between populations and environmental factors, modeling this information across the landscape, and we are developing our ability to analyze change in population locations and management activities over multiple years. However, these data can be mined for far more analysis than POC staff can undertake with currently available resources. Further exploration of the data has great potential to benefit land managers as they make decisions to protect and manage rare plant populations as a parallel effort to managing communities. POC will continue to be a resource for researchers studying rare plant populations, and is already working with individuals from several institutions, as described in this report. These research partnerships, which maximize the benefits of POC, are only possible with the assurance of a stable long-term monitoring program.

Overall, one of the chief benefits of POC is the collaboration among the many partner agencies and their volunteers in monitoring rare species. In addition to eight forest preserve districts, the US Forest Service, and IDNR, 106 other landowners have been involved in the program. Many of these would not otherwise have the resources to engage in a rare plant monitoring program. Most of these partners are also members of the Chicago Wilderness Alliance. POC, as a priority project of the CW Resource Management Team, has played a key role in helping to implement the Chicago Wilderness Biodiversity Recovery Plan.

POC's contributions and recognition on both a regional and national scale are many (see POC's public face). As citizen science becomes more prominent on the national level - a national association on Public Participation in Scientific Research is currently in the process of formation - POC is regularly recognized as

a successful and established monitoring program. For example, POC staff were been invited to author a chapter in an upcoming book on citizen science to be published by the University of California Press.

The future and scope of Plants of Concern are closely linked to funding. It is critical that this long-term monitoring program continue to provide its demonstrated regional benefits. In the current economic climate, funding has become increasingly uncertain. POC's core program is assured through 2014 through support from the Illinois Department of Natural Resources Wildlife Preservation Fund and several grants listed above. In addition, the Chicago Botanic Garden continues to seek federal and local funding to support a comprehensive analysis of Plants of Concern data.

CITATIONS

January 2012 through December 2013

Publications:

2012

- Aaron, J. 2012 Plants of Concern: Showy associates and their rare friends. *Prairie Telegraph* (Midewin). Sept.-Oct (Vol 16, No. 5) pp 1-2.
- Aaron, J. 2012. Plants of Concern: a dry, successful year. *Prairie Telegraph* (Midewin). Nov-Dec (Vol 16, No.6) p.4.
- Chicago Botanic Garden. 2012. Openlands Lakeshore Preserve: Protecting Nature and Enriching Lives. Article about POC in *Keep Growing*. Fall (Vol. 3, Iss. 3) p. 28.
- Citizen Science Central. 2012. POC information page posted on this website. www.birds.cornell.edu/citscitookkit/projects/plantsofconcern.
- Fink, D. (POC monitor). 2012. The geographic distribution of *Sarracenia purpurea* in Illinois and its associated species. Master of Arts thesis for Northeastern Illinois University Department of Geography and Environmental Studies. August. Thesis was based on POC monitoring.
- Freeman, Carol. 2012. In beauty I walk. 2013 art calendar featuring several POC species, with 20% of calendar sale profits coming to Plants of Concern.
- Garness, K. (POC orchid monitor) 2012. My orchid hobby has affected my life. Essay Contest 3rd Place Winner (Plants of Concern prominent in this article). *Illinois Orchid Society Newsletter*. July (Vol. 60, No. 7) pp. 7-9.
- Goad, R. 2012. Rare plants and their monitors cover the Lake Michigan ravines. *The Habitat Herald*. September (Vol 13, Iss 3) p. 6.
- Havens, K., P. Vitt, and S. Masi. 2012. Citizen Science on a Local Scale: The Plants of Concern Program. *Frontiers in Ecology and the Environment*. August: 10(6): pp. 321-323.
- Hitzroth, G. 2012. Long Term Monitoring of *Cypripedium candidum* in the Chicago Wilderness region. *The Native Orchid Conference Journal*. April-June: 9(2): pp. 33-34.
- Masi, S. and G. Hitzroth. 2012. *Plants of Concern Volunteer Manual, 2012*. March.
- Masi, S. and G. Hitzroth: 2012. Plants of Concern: 11 years, 600 volunteers later – what are we learning. *The Habitat Herald*. April: 13(2): pp. 6-7.
- Masi, S., G. Hitzroth, J. Steffen, A. Collins. 2012. Openlands Lakeshore Preserve Monitoring Project. Final report to Openlands, February.
- Masi, S. and R. Goad. 2012. Plants of Concern. Standardized rare plant monitoring using trained volunteers. Final report to the Illinois Wildlife Preservation Fund. December.
- Masi, S. and T. Skyba. 2012. Rare Plant Monitoring at Midewin National Tallgrass Prairie, 2001-2011. Final report to the USFS, Midewin. January.
- Themer, R. 2012. Field Museum builds links with region. *The Daily Journal* (Kankakee), Outdoors Section Nov. 2: p.1 (about Field's Kankakee Sands tour; S. Masi and POC mentioned in article.)

2013

- Aaron, J. 2013. Plants of Concern: gender, conservation and tobacco root. *Prairie Telegraph*, September-October, p. 7.
- Alliance for the Great Lakes. 2013. Ravine rescues: yes, in your backyard – and all around the Great Lakes. *WaterMarks*. Fall, p. 1.
- Alliance for the Great Lakes. 2013. *Ravine and Bluff Vegetation of the Chicago Region. A Rapid Color Guide produced for the Ravine Rapid Assessment Toolkit*. Major contributions from R. Goad; also K. Keiger, S. Masi and D. Fink. March.
- Chicago Botanic Garden. 2013. Plants of Concern: A dedicated diverse group monitors rare and endangered plants. *Keep Growing, Chicago Botanic Garden Member Magazine and Program Guide*. Summer, pp. 20-21.
- Goad, R. 2013. Plants of Concern monitors keep an eye on bloom dates. *The Habitat Herald*. September, pp 6-7.
- Landgraf, Greg. 2013. *Citizen Science. Guide for families taking part in real science*. Huron Street Press (an imprint of the American Library Association. Chicago, IL; includes section on Plants of Concern).
- Masi, S. and E. Bialecki. 2013. Plants of Concern in Cook County, 2004-2012. Final report to the Forest Preserve District of Cook County. January.
- Masi, S. and J. Aaron. 2013. Rare Plant Monitoring at Midewin National Tallgrass Prairie, 2001-2012. Final report to the USFS, Midewin. January.
- Masi, S. and J. Aaron. 2013. Rare Plant Monitoring at Midewin National Tallgrass Prairie, 2001-2013. Final report to the USFS, Midewin. December.
- Masi, S. and R. Goad. 2013. *Plants of Concern Volunteer Manual, 2013*. March.
- Masi, S. and R. Goad. 2013 Final report to the Alliance for the Great Lakes for POC contact work on a Sustain our Great Lakes grant. December.
- Masi, S. and R. Goad. 2013. Final Report to Waukegan Harbor Citizens Advisory Group for POC contract work on a GLRI grant. December.
- Masi, S., R. Goad, Steffen, A. Collins. 2013. Openlands Lakeshore Preserve Monitoring Project. Report submitted to Openlands, February.
- Vander Steldt, E. 2013. *Isoetes butleri* Engelm: genetic, environmental and ecological characteristics of Illinois populations. Masters thesis for the Program of Plant Biology and Conservation, Northwestern University and Chicago Botanic Garden. December.

2014

- Aaron, J. 2014. What does the Fox (glove) say? *Prairie Telegraph*. January-February, 2014, p.7.
- Masi, S. 2014. Notes from the field: Plants of Concern. *The Habitat Herald*. January, pp. 10-11.
- Masi, S., R. Goad and P. Vitt. 2014. Chapter on POC in *Citizen science in ecology and conservation: a practitioner's guide*. University of California Press. Pending press approval.

Other publications in 2012 and 2013 included email newsletters from POC to volunteers and announcements of training workshops in stewardship newsletters including *The Habitat Herald*, *Gatherings Online* (VSN), *Acorn - McHenry County Volunteer Newsletter*, *Prairie Telegraph*, and *Grounds Cover* (CBG).

Presentations, Posters, and Events involving Plants of Concern

2012 and 2013

- Aaron, J. and S. Masi. 2013. Plants of Concern: citizen science and long-term monitoring of rare plant species at Midewin National Tallgrass Prairie. Poster presented at Wild Things Stewardship Conference, University of Illinois Chicago, February 2.
- Bialecki, M., S. Masi and R. Goad. 2012. Attended and presented at End of Season Monitor Gathering. Volunteer Resource Center, Forest Preserve District of Cook County, Chicago. Oct. 20.
- Garness, K. 2012. Art of the Land. Juried art show including her POC images. The Land

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- Conservancy of McHenry County, Starline Gallery, Harvard, IL. September.
- Garness, K. 2012. Native Plants of the Chicago Region. Art exhibit of her work including POC species. Volo Bog Nature Center, Volo, IL. May.
- Garness, K. 2012. Wondrous Things. Art exhibit of her works including POC species. Independence Grove, Forest Preserve District of Lake County, Libertyville, IL. April-July.
- Goad, R. 2012. Plants of Concern: a volunteer-based regional rare plant monitoring program. Presentation to Wild Ones, DuPage County Chapter. November 15.
- Goad, R. 2013. New Tools for Ravine Restoration: Improving Your Great Lakes Coastline: Vegetation Rapid Assessment. Webinar hosted by the Alliance for the Great Lakes. Available at: <http://www.greatlakes.org/ravinerestoration/toolkit> April 25.
- Goad, R. 2013. Plants of Concern, a Regional Rare Plant Monitoring Program in Northeastern Illinois. Presentation to the Illinois Native Plant Society, Southern Chapter. November 8.
- Goad, R. and S. Masi. 2012. Led University of Wisconsin, Parkside, Field Methods Class (POC applications) at Chiwaukee Prairie, Kenosha County, Wisconsin, October 9.
- Goad, R. and S. Masi. 2013. Plants of Concern, a citizen science-based monitoring program in Chicago Wilderness since 2001. Poster presented at Wild Things Stewardship Conference, University of Illinois Chicago, February 2.
- Goad, R. and S. Masi. 2012. Plants of Concern, a citizen science-based monitoring program in Chicago Wilderness since 2001. Poster presented at the Indiana Dunes National Lakeshore Science Conference, Indiana University Northwest. www.nps.gov/indu/indiana-dunes-science-conference-2012.htm November 28.
- Hitzroth, G., S. Masi, and P. Vitt. 2012. Plants of Concern: Monitoring Rare Plant Species in Chicago Wilderness. Presentation at the Illinois Lakes Management Association Conference at Northern Illinois University, DeKalb, IL, March 2.
- Levine, H. 2012. Using spatial analysis and GIS to investigate patterns in rare plants. Poster presented at Research Experience for Undergraduates, Chicago Botanic Garden. August 17.
- Masi, S. and R. Goad. 2013. Plants of Concern, Chicago Botanic Garden: a regional rare plant monitoring program, an overview. Presentation as part of invitational symposium on Public Participation in Scientific Research. *Botany 2013* conference, New Orleans, LA, July 27-31.
- Masi, S. 2012. Plants of Concern: Citizen Scientists Monitor Rare Species. Presentation to Lake County Audubon Society, May 7.
- Masi, S. 2013. Attended Openlands 50th Anniversary Luncheon. Chicago. October 25.
- Masi, S. 2014. Winter Trails and Naturalist Tales. Presentation on Plants of Concern for the University of Illinois Extension Master Naturalist Program. Severson Dells Nature Center, Rockford, IL. February 8.
- Masi, S., assisted by E. Bialecki. 2012. Asters, Goldenrods and More. Presentation and wildflower tour of Dixon Prairie for the North Branch Restoration Project, August 11.
- Masi, S. and A. Wilson. 2012. Conducted prairie tour featuring native plants and the Plants of Concern Program for Kane County Wild Ones. Dixie Briggs Fromm Fromm Nature Preserve, Carpentersville. June 30.
- Masi, S. and R. Goad. 2013. *Plants of Concern Volunteer Manual, 2013*. March.
- Masi, S. and R. Goad. 2012. Plants of Concern, a citizen science monitoring program in Chicago Wilderness since 2001. Poster presentation at the Conference on Public Participation in Scientific Research, Portland, OR, August 4-5.
- Masi, S. and R. Goad. 2013. Attended the joint celebration of Openlands and the Illinois Nature Preserves Commission. Openlands Lakeshore Preserve and Midwest Young Artists. May 6.
- Plants of Concern staff. 2013. Conducted four POC volunteer training workshops. April and June.
- Plants of Concern staff. 2012-2013. Plants of Concern: volunteers monitor rare plants in a standardized regional program. Presentation of potential research opportunities to Northwestern University graduate students, Chicago Botanic Garden. November 16, 2012 and November 22, 2013.

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- Plants of Concern staff. 2012-2013. Led several rare plant forays with teams of volunteers in monitoring searches over larger areas, at Lyman Woods (in cooperation with DuPage FPD), Braidwood Dunes (in cooperation with Will County FPD), and Illinois Beach State Park (in cooperation with IDNR staff) and Midewin National Tallgrass Prairie. POC volunteers were notified of these events at workshops, on the website, and by email.
- Plants of Concern staff. 2012 and 2013. POC information table for World Environment Day, Chicago Botanic Garden. June.
- Plants of Concern staff. 2013. POC information table at *A Behind the Scenes Tour*, Chicago Botanic Garden. October 22.
- Plants of Concern staff. Presented Plants of Concern achievements at End of Season Monitoring Gathering. Thatcher Pavilion, Thatcher Woods, River Forest, IL. October 20.
- Plants of Concern staff and volunteers. 2013. Plants of Concern booth at Wild Things Stewardship Conference. University of Illinois Chicago, February 2.
- Powell, E. (POC monitor). 2012. Plants of Concern. Presentation to the Kenilworth Garden Club. Kenilworth, IL. June 28.
- Strohm, J. 2013. Taught class on citizen science (including Plants of Concern) for the University of Illinois Extension Service. June 19. Strohm is the Kendall County Forest Preserve District POC liaison.
- Wright, C., R. Goad, E. Yates, J. Fant, and S. Still. 2013. GIS based spatial analysis of rare plant populations: modeling habitat suitability for gravel hill prairie species. Poster presented at 40th Annual Natural Areas Association Conference, Holiday Inn Chicago Mart Plaza, Chicago, IL, October 1-4. POC data for *Asclepias lanuginosa* and *Cirsium hillii* were used for this presentation.

Awards:

- Masi, S. 2013. North Branch Restoration Project recognition award (for Plants of Concern leadership and partnership with the North Branch, and exemplary life's work in conservation. January 26.
- Masi, S. 2013. Chicago Botanic Garden Employee of Distinction Award. For leadership of Plants of Concern and other professional achievements. November 13.
- Masi, S. 2014. Habitat Project Conservation Leadership Award from Audubon, Chicago Region (announced; to be awarded February 22, 2014)
- Plants of Concern and S. Masi. 2014. Forest Preserve District of Will County Partnership Award (announced; to be awarded March, 2014)

Community Service – POC Related

- Goad, R. Secretary of the Illinois Native Plant Society. (State and Northeast Illinois Chapter)
- Goad, R. Attended Annual VSN (The Nature Conservancy and Illinois Nature Preserves Commission) Gathering for Northern Illinois Groups, the Morton Arboretum, December 13, 2013.
- Goad, R. and D. Suarez. Served as field trip leaders for the 40th Annual Natural Areas Association Conference, Holiday Inn Chicago Mart Plaza, Chicago IL, October 1-4, 2013.
- Masi, S. Member, Illinois Endangered Species Protection Board.
- Masi, S. Endangered Species Protection Board Technical Expert Consultant (Plants).
- Masi, S. Co-chair of 40th Annual Natural Areas Association Conference field trip committee. Oct. 1-4, 2013. Chicago Mart Plaza, Chicago.
- Masi, S. and R. Goad. Reported on POC at the Annual VSN (The Nature Conservancy and Illinois Nature Preserves Commission) Gathering for Northern Illinois Groups. South Shore Cultural Center, Chicago, October 23, 2012.
- Suarez, D. Co-leader, Habitat 2030 (ecological restoration group of 20 and 30-somethings, Forest Preserve District of Cook County). 2013.
- Suarez, D. Seed Collecting Coordinator, Deer Grove East, Forest Preserve District of Cook County.

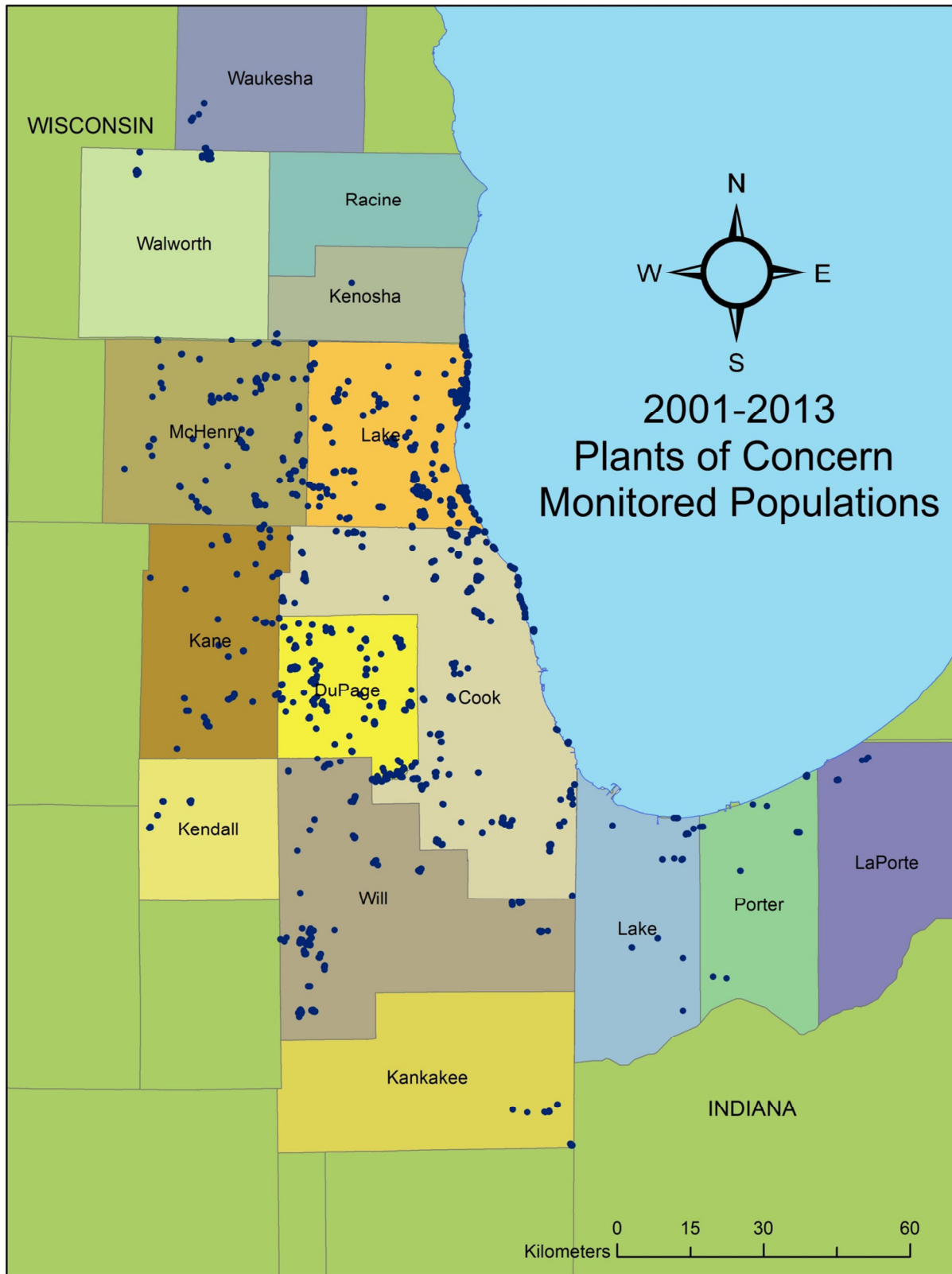
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Grants: For Reported Grant Period and Pending

- 2011-2013. Cost-Share Agreement with the US Forest Service for monitoring work at
- Midewin National Tallgrass Prairie. Pending: 2014-2018.
- 2013-2014. Illinois Wildlife Preservation Fund grant
- 2013-2104. The Nature Conservancy's Volunteer Stewardship Network stewardship grant.
- 2012-2013. Sustain our Great Lakes (National Fish and Wildlife Foundation): Northeast Illinois Ravine Restoration and Monitoring Program project awarded to the Alliance for the Great Lakes. POC is a subcontracted partner in this grant.
- 2013. Sally Mead Hands Foundation grant..
- 2012 and 2013. Openlands contract for monitoring work at Openlands Lakeshore Preserve.. 2014 anticipated.
- 2012 and 2013. Waukegan Area Citizen's Advisory Group, Great Lakes Restoration Initiative grant. POC is a subcontracted partner in this grant. 2014 potential.
- 2012 and 2013. Forest Preserve District of Cook County contract for a POC internship position. 2014 anticipated.
- 2012 and 2013. Garden Club of America. 2014 anticipated.

ATTACHMENTS

1. GIS Map of POC Monitored Populations
2. Level 1 Monitoring Form
3. Level 1 Land Management Form Parts 1-3
4. Advisory Group Member Listing, 2012
5. Plants of Concern Species List (indicate which are IL, WI, IN)
6. Plants of Concern 2001-2012. Counties, Sites, Landowners & Element Occurrences
7. Plants of Concern 2001-2012. Species EO Frequency by County, a Regional View
8. Example of a POC Training Workshop Agenda
- 9A. Advisory Group Meeting Minutes, 2012
- 9B. Advisory Group Meeting Minutes, 2013
10. Illinois Department of Natural Resources-owned and Nature Preserve Sites Monitored by Plants of Concern.
11. POC's official data request form
12. Chicago Botanic Garden's Plants of Concern Program Receives Illinois Wildlife Preservation Fund Grant. Press Release issued by the Chicago Botanic Garden, Sept. 15, 2012.
13. Photo image descriptions and photographer attributions (photos included separately as digital files)



Note: Most points represent multiple subpopulations and element occurrences.



Plants of Concern Monitoring Form – 2013

Submitted to POC? Submitted to Land Manager? Submitted online?

LEAD MONITOR'S NAME: _____ **MONITORING DATE:** _____

Use one form for each subpopulation. Subpops are separated by at least 50 meters between the closest plants in each group. Monitor within 10 days of previous year's monitoring date. For comparison, refer to the last monitoring report, which you can access with your login from the website or by contacting POC. Complete every blank. For the GPS, associates, or directions sections **ONLY**, you may write "same as last report" if there are no changes. Review guidelines in the Volunteer Manual or at www.plantsofconcern.org.

SECTION 1: GENERAL SPECIES AND SITE IDENTIFICATION

GENUS: _____ **EOR #:** _____
SPECIES: _____ **COUNTY:** _____
VARIETY: _____ **LAND OWNER:** _____
SITE NAME: _____ **MANAGER:** _____
SUBPOPULATION #: _____

PLANTS IN SUBPOP FOUND? Yes No → If plants are not found, go to Sections 4, 5, 6 and 7 to input information on the area searched.

SECTION 2: GPS

Record new GPS data whenever possible, & especially for new subpops, annuals, if plants have moved, or after 3 years.

IS GPS DATA NEW THIS YEAR? **COORDINATE SYSTEM** **DATUM**
 Yes (fill blanks below) Decimal Degrees (e.g. dd.dddd N) WGS 84
 No, but GPS is same as before (Go to Section 3) Other: _____ Other: _____
 No GPS data to submit (Go to Section 3) If 'Other', specify what was used (see manual for guidelines)

	LATITUDE	LONGITUDE	ACCURACY (m)
CENTER:	°N	°W	
NORTH:	°N	°W	
SOUTH:	°N	°W	
EAST:	°N	°W	
WEST:	°N	°W	

Enter N, S, E, W points ONLY if dimensions exceed 13 m

SECTION 3: SUBPOPULATION INFORMATION

<p>DISTANCE COVERED BY POPULATION (meters) <i>Measure each year if subpop is found</i></p> <p>E-W: _____ N-S: _____</p> <p>GROWTH FORM? <i>See POC website for standardized growth forms</i></p> <p><input type="checkbox"/> Stems <input type="checkbox"/> Clumps <input type="checkbox"/> Rosettes <input type="checkbox"/> Other: _____</p>	<p>TODAY'S SOIL CONDITION?</p> <p><input type="checkbox"/> Flooded <input type="checkbox"/> Saturated <input type="checkbox"/> Moist, well-drained <input type="checkbox"/> Dry</p> <p>REPRODUCTIVE STATE?* % Reproductive: _____</p> <p><input type="checkbox"/> Flower <input type="checkbox"/> Fruit <input type="checkbox"/> Flower & Fruit <input type="checkbox"/> Vegetative <input type="checkbox"/> Don't Know</p>	<p>PLANT COUNT RANGE</p> <p><input type="checkbox"/> < or = 100 <input type="checkbox"/> 101-200 <input type="checkbox"/> 201-400 <input type="checkbox"/> 401- 800 <input type="checkbox"/> >800</p> <p>TOTAL NUMBER?*** <i>Include juveniles</i> #: _____</p> <p>COUNT ESTIMATED? <input type="checkbox"/> Yes <input type="checkbox"/> No</p> <p>Please describe estimation method in Notes on p.3</p>	<p>JUVENILES PRESENT?</p> <p><input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Annual Species <input type="checkbox"/> Don't know how to identify</p>
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** % Reproductive can be found by dividing the number of reproductive plants (flowering or fruiting) by the total number of plants.
 *** Count plants if ≤ 100, or provide a number as close as possible & select a range. See population estimation exercise in the Volunteer Manual.

SECTION 4: NATIVE ASSOCIATE SPECIES INFORMATION

ASSOCIATES - list dominant native species. List additional ones if you prefer. Write "same as last report" if no change.

Trees (including saplings and seedlings):

Herbaceous Plants:

- _____
- 2 _____
- 3 _____

- 1 _____
- 2 _____
- 3 _____
- 4 _____
- 5 _____

Shrubs/Vines:

- 1 _____
- 2 _____
- 3 _____

SECTION 5: THREATS TO THE SUBPOPULATION (complete each time)

DEGREE OF THREATS - Check all that apply, including if none (0%)

Invasive woody brush encroachment < 1 m tall	<input type="checkbox"/>	0%	<input type="checkbox"/>	1-25%	<input type="checkbox"/>	26-50%	<input type="checkbox"/>	51-75%	<input type="checkbox"/>	76-100%
Invasive brush/tree encroachment > 1 m tall	<input type="checkbox"/>	0%	<input type="checkbox"/>	1-25%	<input type="checkbox"/>	26-50%	<input type="checkbox"/>	51-75%	<input type="checkbox"/>	76-100%
Deer browse (% of study plants browsed)	<input type="checkbox"/>	0%	<input type="checkbox"/>	1-25%	<input type="checkbox"/>	26-50%	<input type="checkbox"/>	51-75%	<input type="checkbox"/>	76-100%
Deer browse (% of all plants browsed)	<input type="checkbox"/>	0%	<input type="checkbox"/>	1-25%	<input type="checkbox"/>	26-50%	<input type="checkbox"/>	51-75%	<input type="checkbox"/>	76-100%
Erosion (% of area with visible signs)	<input type="checkbox"/>	0%	<input type="checkbox"/>	1-25%	<input type="checkbox"/>	26-50%	<input type="checkbox"/>	51-75%	<input type="checkbox"/>	76-100%
Authorized trails impacting the population	<input type="checkbox"/>	0%	<input type="checkbox"/>	1-25%	<input type="checkbox"/>	26-50%	<input type="checkbox"/>	51-75%	<input type="checkbox"/>	76-100%
Unauthorized trails impacting the population	<input type="checkbox"/>	0%	<input type="checkbox"/>	1-25%	<input type="checkbox"/>	26-50%	<input type="checkbox"/>	51-75%	<input type="checkbox"/>	76-100%
Other: _____	<input type="checkbox"/>	0%	<input type="checkbox"/>	1-25%	<input type="checkbox"/>	26-50%	<input type="checkbox"/>	51-75%	<input type="checkbox"/>	76-100%
Other: _____	<input type="checkbox"/>	0%	<input type="checkbox"/>	1-25%	<input type="checkbox"/>	26-50%	<input type="checkbox"/>	51-75%	<input type="checkbox"/>	76-100%
Other: _____	<input type="checkbox"/>	0%	<input type="checkbox"/>	1-25%	<input type="checkbox"/>	26-50%	<input type="checkbox"/>	51-75%	<input type="checkbox"/>	76-100%

OTHER THREATS - If you notice an immediate threat to the population contact the landowner or POC

INVASIVE SPECIES - % of impact of invasive plants (**EXOTIC OR NATIVE**). List more than 6 if needed.

1 _____	<input type="checkbox"/>	1-20%	<input type="checkbox"/>	21-40%	<input type="checkbox"/>	41-60%	<input type="checkbox"/>	61-80%	<input type="checkbox"/>	81-100%
2 _____	<input type="checkbox"/>	1-20%	<input type="checkbox"/>	21-40%	<input type="checkbox"/>	41-60%	<input type="checkbox"/>	61-80%	<input type="checkbox"/>	81-100%
3 _____	<input type="checkbox"/>	1-20%	<input type="checkbox"/>	21-40%	<input type="checkbox"/>	41-60%	<input type="checkbox"/>	61-80%	<input type="checkbox"/>	81-100%
4 _____	<input type="checkbox"/>	1-20%	<input type="checkbox"/>	21-40%	<input type="checkbox"/>	41-60%	<input type="checkbox"/>	61-80%	<input type="checkbox"/>	81-100%
5 _____	<input type="checkbox"/>	1-20%	<input type="checkbox"/>	21-40%	<input type="checkbox"/>	41-60%	<input type="checkbox"/>	61-80%	<input type="checkbox"/>	81-100%
6 _____	<input type="checkbox"/>	1-20%	<input type="checkbox"/>	21-40%	<input type="checkbox"/>	41-60%	<input type="checkbox"/>	61-80%	<input type="checkbox"/>	81-100%

Section 6: Management within the subpopulation in the past year (complete each time)

BURNING

Yes % Monitored 1-33%
 No population 34-66%
 Don't Know affected: 67-100%
EVIDENCE: Don't Know

Ash
 No leaf litter/duff
 Steward or manager's word
 Other: _____

BRUSH OR INVASIVE TREE REMOVAL

Yes % Monitored 1-33%
 No population 34-66%
 Don't Know affected: 67-100%
EVIDENCE: Don't Know

Freshly cut stumps **SPECIES REMOVED:**
 Recent brush piles _____
 Steward or manager's word _____
 Other: _____

HERBACEOUS INVASIVE REMOVAL

Yes % Monitored 1-33%
 No population 34-66%
 Don't Know affected: 67-100%
EVIDENCE: Don't Know

Piles of pulled plants **SPECIES REMOVED:**
 Brown/dying plants _____
 Steward or manager's word _____
 Other: _____

MOWING***

Yes % Monitored 1-33%
 No population 34-66%
 Don't Know affected: 67-100%
EVIDENCE: Don't Know

Cut stems
 Fresh clippings
 Steward or manager's word
 Other: _____

*** Include a "Yes" response for mowing only if mowing is done as a management practice. Mowing roadsides or trails is **NOT** a management tool for natural areas, and should be included in threats section.

OTHER MANAGEMENT WITHIN OR AFFECTING THE SUBPOPULATION AND % OF SUBPOPULATION AFFECTED:

SECTION 7: DIRECTIONS TO SUBPOPULATION AND NOTES

Give detailed directions for **new subpopulations** or **changes** in directions. Include: nearest town, route number, parking, major trail, and walking directions; use landmarks. Optional: sketch a simple location map and outline of the population within the site. Use back if needed.

DIRECTIONS: If unchanged, write same as last report.

NOTES (use reverse if necessary):

Monitor Names	Roles*	Hours

Monitor Names	Roles*	Hours

*ROLES: Volunteer, steward, staff or intern. For new volunteers, provide confidentiality form & contact information.

Within 3 weeks of monitoring, submit original form to POC, send a copy to the Land Manager, and keep a copy for your records. A scanned image of the completed monitoring form may be e-mailed instead of mailing a paper form. See guidelines in Volunteer Manual for submission procedures. **IN ADDITION, on-line submission is strongly urged at <http://www.plantsofconcern.org>.**

PLANTS OF CONCERN LAND MANAGEMENT FORM - 2013
PART 1: MANAGEMENT IN THE PAST YEAR - SUBPOPULATIONS



PERSON COMPLETING FORM: _____ DATE SUBMITTED: _____

LEAD MONITOR'S NAME: _____ YEARS SUBPOP(S) MONITORED: _____

If you previously completed a Land Management Form for the EOR, or for its subpopulations, only fill in Forms Part 1 and 2. If you have never completed a Land Management form for the subpopulation, please fill out Form Part 3. Include one species and subpopulation per form. Please review the Guidelines, available in the POC manual or on www.plantsofconcern.org.

SECTION 1: GENERAL SPECIES AND SITE IDENTIFICATION

SITE NAME: _____ LAND OWNER: _____
 COUNTY: _____ MANAGER: _____
 1. SPECIES: _____ EOR, SUBPOP: _____
 2. SPECIES: _____ EOR, SUBPOP: _____
 3. SPECIES: _____ EOR, SUBPOP: _____
 4. SPECIES: _____ EOR, SUBPOP: _____

SECTION 2: MANAGEMENT WITHIN THE MONITORED SUBPOPULATION(S)

If there was a gap since last submission, provide information for intervening years.

BURNING or MOWING – Please specify: Burning (B) or Mowing (M) *Mowing denotes clearing of herbaceous material or small brush for community management, in open areas, not trail maintenance. The use of large machinery to remove primarily woody material should be listed below, under invasive species management. Burn intensity uses a range of 1-33% being low, 34-66% moderate, 67-100% high. See page 20 of the volunteer manual for further definition.*

ACTIVITY (B or M)	DATE (dd/mm/yy)	% AREA AFFECTED			% INTENSITY (Burning only)			Notes
		1-33	34-66	67-100	1-33	34-66	67-100	
		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

INVASIVE SPECIES MANAGEMENT (WOODY OR HERBACEOUS): Removal and/or Herbiciding % refers to the percent of an invasive species affected (removed and/or herbicided) in the population area, i.e., was it all, or only partly, removed.

DATE (dd/mm/yy)	SPECIES BEING REMOVED	% REMOVAL			% HERBICIDING			Notes
		1-33	34-66	67-100	1-33	34-66	67-100	
		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

OTHER MANAGEMENT BEING CONDUCTED WITHIN THE SUBPOPULATION(S) AND DATES AND DEGREE TO WHICH IT AFFECTS SUBPOPULATION(S):

SECTION 3: ADJACENT LAND USE NOTES

LAND USE ADJACENT TO SITE THAT MIGHT AFFECT MONITORED SUBPOPULATION(S):

**PART 2: MANAGEMENT IN THE PAST YEAR - SITES**

PERSON COMPLETING FORM: _____ DATE SUBMITTED: _____

LEAD MONITOR'S NAME: _____ YEAR SUBPOP(S) MONITORED: _____

If you previously completed a Land Management Form for the EOR, or for its subpopulations, only fill in Part 1 and 2 Forms. If you have never completed a Land Management form for the subpopulation, please fill out Part 3. You may include more than one species (list all species) and subpopulation (list all subpops) per form if they occur in the same management location. Please review the Guidelines, available in the POC Manual or on www.plantsofconcern.org.

SECTION 1: GENERAL SITE AND SPECIES SITE IDENTIFICATION

SITE NAME: _____ LAND OWNER: _____

COUNTY: _____ MANAGER: _____

1.TAXON: _____ 3.TAXON: _____

EOR, SUBPOP: _____ EOR, SUBPOP: _____

2.TAXON: _____ 4.TAXON: _____

EOR, SUBPOP: _____ EOR, SUBPOP: _____

SECTION 2: MOST CURRENT GENERAL SITE MANAGEMENT

<u>BURNING?</u>	<u>INVASIVE BRUSH OR TREE</u>	<u>HERBACEOUS INVASIVES</u>	<u>MOWING?*</u>	<u>HYDROLOGICAL MODIFICATIONS?</u>
<input type="checkbox"/> Yes	<input type="checkbox"/> Yes	<input type="checkbox"/> Yes	<input type="checkbox"/> Yes	<input type="checkbox"/> Yes
<input type="checkbox"/> No	<input type="checkbox"/> No	<input type="checkbox"/> No	<input type="checkbox"/> No	<input type="checkbox"/> No
<input type="checkbox"/> Don't Know	<input type="checkbox"/> Don't Know	<input type="checkbox"/> Don't Know	<input type="checkbox"/> Don't Know	<input type="checkbox"/> Don't Know

DEER REMOVAL

SEASON _____ YEAR: _____ # OF DEER REMOVED: _____

SIZE OF AREA INVOLVED (# ACRES): _____

OTHER MANAGEMENT CONDUCTED WITHIN THE SITE THIS YEAR: _____

SECTION 3: ADDITIONAL COMMENTS

*Mowing denotes clearing of herbaceous material or small brush for community management, in open areas, not trail maintenance. The use of large machinery to remove primarily woody material should be listed below, under invasive species management

PLANTS OF CONCERN LAND MANAGEMENT FORM – 2013
PART 3: HISTORY



PERSON COMPLETING FORM: _____ **DATE SUBMITTED:** _____

This form only needs to be completed once for each EOR or subpopulation. If you previously completed this part of the Land Management form for the subpopulation, only complete Parts 1 and 2. One form may be used for multiple species sharing a management area.

SECTION 1: GENERAL SITE AND SPECIES IDENTIFICATION

SITE NAME: _____ **LAND OWNER:** _____

COUNTY: _____ **MANAGER:** _____

1.TAXON: _____ **3.TAXON:** _____

EOR, SUBPOP: _____ **EOR, SUBPOP:** _____

2.TAXON: _____ **4.TAXON:** _____

EOR, SUBPOP: _____ **EOR, SUBPOP:** _____

SECTION 2: POPULATION INFORMATION

HABITAT/COMMUNITY TYPE: _____

(CW CLASSIFICATION from Biodiversity Recovery Plan, starting on p. 140– available at www.plantsofconcern.org)

IS THIS POPULATION:

- Naturally occurring
 Introduced through restoration
 Both
 Don't know

IF INTRODUCED, PLEASE PROVIDE THE FOLLOWING INFORMATION:

FROM			YEAR	SOURCE
SEED	PLANT	BOTH		
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		

(Indicate which species, if multiples are included on form.)

SECTION 3: LAND USE HISTORY OF THE SITE, AS IT MAY AFFECT SUBPOPULATIONS

PLOWING/AGRICULTURE **GRAZING:** **TILING/DITCHING:** **Other:** _____

Yes Yes Yes _____

No No No _____

Don't Know Don't Know Don't Know _____

Years: _____ Years: _____ Years: _____ Years: _____

SECTION 3: HISTORY OF GENERAL SITE MANAGEMENT

BURNING? **INVASIVE BRUSH OR TREE** **HERBACEOUS INVASIVES** **MOWING FOR COMMUNITY** **HYDROLOGICAL MODIFICATIONS?**

Yes Yes Yes Yes Yes

No No No No No

Don't Know Don't Know Don't Know Don't Know Don't Know

YEAR MANAGEMENT BEGAN AT THIS SITE:

OTHER MANAGEMENT CONDUCTED WITHIN THE SITE:

Name	Title	Agency/Organization
Juanita Armstrong-Ullberg	Natural Resources Lane Manager	FPD Will County
Jane Balaban	Regional Steward	North Branch Restoration Project
Jeannie Barnes	Database Coordinator	Illinois Natural History Survey
Robb Cleave	Volunteer Coordinator	FPD Kane County
Rebecca Collings	Conservation Ecologist	Field Museum
Aimee Collins	Lakeshore Preserve Site Manager	Openlands
Jennifer Durkin	Botanist	Midewin
Carol Freeman	Photographer	Carol Freeman Photography
Karen Glennemeier	Conservation Scientist	Audubon
		Illinois Endangered Species Protection Board
R. Dan Gooch	Chair	
Rebecca Grill	Natural Areas Coordinator	Highland Park Park District
Ben Haberthur	Restoration Ecologist	FPD Kane County
Cindy Hedges	Volunteer Coordinator	FPD DuPage County
Tara Kieninger	Database Program Manager	Illinois Natural Heritage Database
Ken Klick	Ecologist	FPD Lake County
Scott Kobal	Ecologist	FPD DuPage County
Linda Masters	Restoration Specialist	Openlands
Mitchell Murdock	Natural Areas Manager (through 2012)	Chicago Park District
Kelly Neal	Stewardship Project Manager	Illinois Nature Preserves Commission
Chip O'Leary	Chief Ecologist	FPD Cook County
Stephen Packard	Ecologist	Illinois Audubon
Kim Roman	Field Representative	Illinois Nature Preserves Commission
Laurie Ryan	Plant Ecologist	McHenry County Conservation District
Susie Schrieber	President	Waukegan Citizen's Advisory Group
		Illinois Department of Natural Resources
Brad Semel	Heritage Biologist	
Jason Steger	Volunteer Coordinator	Chicago Park District
Jody Strohm	Volunteer Coordinator	FPD Kendall County
Renee Thakali	Restoration Team Leader	Midewin National Tallgrass Prairie
	Volunteer Stewardship Network	
Karen Tharp	Coordinator	The Nature Conservancy
Pati Vitt	Manager of Conservation Programs	Chicago Botanic Garden
		Illinois Department of Natural Resources
John Wilker	Program Manager	

Species Currently Monitored by Plants of Concern

Species	Common name	Status*	Species	Common name	Status*
<i>Actaea rubra</i>	Red Baneberry	R	<i>Calopogon oklabomensis</i>	Oklahoma grasspink	E
<i>Adiantum pedatum</i>	Maidenhair Fern	R	<i>Calopogon tuberosus</i>	Grasspink Orchid	E
<i>Agalinis skinneriana</i>	Pale False Foxglove	T	<i>Carex alata</i>	Wingseed Sedge	E
<i>Alnus rugosa</i>	Speckled alder	E	<i>Carex aurea</i>	Golden Sedge	T
<i>Amelanchier interior</i>	Inland Serviceberry	T	<i>Carex bromoides</i>	Brome Hummock Sedge	T
<i>Amelanchier sanguinea</i>	Roundleaf Serviceberry	E	<i>Carex brunnescens</i>	Green Bog Sedge	E
<i>Ammophila breviligulata</i>	American Beach Grass	E	<i>Carex canescens</i> var. <i>disjuncta</i>	Gray Bog Sedge	E
<i>Arabis hirsuta</i>	Hairy Rock Cress	R	<i>Carex crawei</i>	Early Fen Sedge	R
<i>Aralia racemosa</i>	Spikenard	R	<i>Carex cranfordii</i>	Crawford's oval sedge	E
<i>Arctostaphylos uva-ursi</i>	Common Bearberry	E	<i>Carex crus-corvi</i>	Crowfoot Fox Sedge	R
<i>Aristolochia serpentaria</i>	Virginia Snakeroot	R	<i>Carex cryptolepis</i>	Small Yellow Sedge	E
<i>Artemisia serrata</i>	Saw-toothed Sagebrush	R	<i>Carex disperma</i>	Shortleaf Sedge	E
<i>Asclepias amplexicaulis</i>	Sand Milkweed	R	<i>Carex echinata</i>	Prickly Sedge	E
<i>Asclepias exaltata</i>	Poke Milkweed	R	<i>Carex formosa</i>	Awnless Graceful Sedge	E
<i>Asclepias hirtella</i>	Tall Green Milkweed	R	<i>Carex frankii</i>	Bristly Cattail Sedge	R
<i>Asclepias lanuginosa</i>	Woolly Milkweed	E	<i>Carex garberi</i>	False Golden Sedge	E
<i>Asclepias meadii</i>	Mead's Milkweed	E	<i>Carex gracilescens</i>	Slender Wood Sedge	R
<i>Asclepias ovalifolia</i>	Oval Milkweed	E	<i>Carex intumescens</i>	Shining Bur Sedge	T
<i>Asclepias perennis</i>	White Milkweed	R	<i>Carex leptalea</i>	Slender Sedge	R
<i>Asclepias viridiflora</i>	Green Milkweed	R	<i>Carex oligosperma</i>	Running Bog Sedge	E
<i>Aster furcatus</i>	Forked Aster	T	<i>Carex pedunculata</i>	Long-stalked Hummock Sedge	R
<i>Baptisia leucophaea</i>	Cream Wild Indigo	R	<i>Carex trisperma</i>	Three-seeded Bog Sedge	E
<i>Beckmannia syzigachne</i>	American Sloughgrass	E	<i>Carex tuckermanii</i>	Bent-Seeded Hop Sedge	E
<i>Besseyia bullii</i>	Kitten Tails	T	<i>Carex umbellata</i>	Early Oak Sedge	R
<i>Betula alleghaniensis</i>	Yellow Birch	E	<i>Carex utriculata</i>	Common Yellow Lake Sedge	R
<i>Betula papyrifera</i>	Paperbark Birch	R	<i>Carex viridula</i>	Green Yellow Sedge	T
<i>Betula populifolia</i>	Gray Birch	R	<i>Carex woodii</i>	Wood's Stiff Sedge	T
<i>Bidens discoidea</i>	Swamp Beggar's Ticks	R	<i>Cassia hebecarpa</i>	American Senna	R
<i>Bolboschoenus maritimus</i>	Alkali Bulrush	R	<i>Castilleja sessiliflora</i>	Downy Yellow Painted Cup	E
<i>Botrychium campestre</i>	Iowa Moonwort	E	<i>Ceanothus americanus</i>	New Jersey Tea	R
<i>Cacalia plantaginea</i>	Prairie Indian Plantain	R	<i>Ceanothus herbaceus</i>	Red Root	T
<i>Cakile edentula</i>	Sea Rocket	T	<i>Chamaedaphne calyculata</i>	Leatherleaf	T
<i>Callitriche heterophylla</i>	Large Water Starwort	R	<i>Chamaesyce polygonifolia</i>	Seaside Spurge	E
<i>Callitriche palustris</i>	Common Water Starwort	R	<i>Cicuta bulbifera</i>	Bulblet-bearing Water Hemlock	R

Species Currently Monitored by Plants of Concern

Species	Common name	Status*	Species	Common name	Status*
<i>Cimicifuga racemosa</i>	Black Cohosh	E	<i>Erythronium americanum</i>	Yellow Trout Lily	R
<i>Cirsium hillii</i>	Prairie Thistle, Hill's Thistle	R	<i>Eupatorium sessilifolium</i> var. <i>brittonianum</i>	Upland Boneset	R
<i>Cirsium pitchei</i>	Dune thistle	T	<i>Festuca paradoxa</i>	Clustered fescue	R
<i>Cladium mariscoides</i>	Twig Rush	R	<i>Filipendula rubra</i>	Queen-of-the-Prairie	E
<i>Collinsia verna</i>	Blue-Eyed Mary	R	<i>Galium labradoricum</i>	Bog Bedstraw	R
<i>Comptonia peregrina</i>	Sweet Fern	E	<i>Gentiana flavida</i>	Yellowish Gentian	R
<i>Conopholis americana</i>	American cancer-root	R	<i>Gentiana procera</i>	Small Fringed Gentian	R
<i>Corallorhiza maculata</i>	Spotted Coral Root	T	<i>Gentianopsis crinita</i>	Fringed Gentian	R
<i>Cornus rugosa</i>	Round-leaved Dogwood	R	<i>Geranium bicknellii</i>	Northern Cranesbill	E
<i>Cypripedium calceolus</i> var. <i>parviflorum</i>	Small Yellow Lady's Slipper	R	<i>Geum rivale</i>	Purple Avens	R
<i>Cypripedium calceolus</i> var. <i>pubescens</i>	Large Yellow Lady's Slipper	R	<i>Geum triflorum</i>	Prairie Smoke	R
<i>Cypripedium candidum</i>	White Lady's-Slipper	T	<i>Goodyera pubescens</i>	Downy Rattlesnake Plantain	R
<i>Cypripedium parviflorum</i> var. <i>makasin</i>	Small Yellow Lady's Slipper	E	<i>Gratiola quartermaniae</i>	Limestone Hedge-hyssop	E
<i>Cypripedium reginae</i>	Showy Lady's Slipper	E	<i>Helianthus giganteus</i>	Tall Sunflower	E
<i>Cypripedium x andrewsii</i>	Hybrid Lady's Slipper	R	<i>Hepatica nobilis</i> var. <i>obtusata</i>	Round-lobed Hepatica	R
<i>Dalea foliosa</i>	Leafy Prairie Clover	E	<i>Hybanthus concolor</i>	Green Violet	R
<i>Delphinium tricorne</i>	Dwarf Larkspur	R	<i>Hydrastis canadensis</i>	Golden Seal	R
<i>Desmodium canescens</i>	Hoary Ticktrefoil	R	<i>Hypericum adpressum</i>	Shore St. John's Wort	E
<i>Desmodium cuspidatum</i>	Bracted Tick Trefoil	R	<i>Hypericum kalmianum</i>	Kalm St. Johnswort	E
<i>Diarrhena americana</i>	Beak Grass	R	<i>Hypericum swinkianum</i>	Swink's St. Johnswort	R
<i>Dichanthelium boreale</i>	Northern Panic Grass	E	<i>Ilex verticillata</i>	Winterberry	R
<i>Diervilla lonicera</i>	Dwarf Bush Honeysuckle	R	<i>Iliamna remota</i>	Kankakee Mallow	E
<i>Dirca palustris</i>	Leatherwood	R	<i>Iodanthus pinnatifidus</i>	Violet Cress	R
<i>Drosera intermedia</i>	Narrow-leaved Sundew	T	<i>Isoetes butleri</i>	Glade Quillwort	E
<i>Drosera rotundifolia</i>	Round-Leaved Sundew	E	<i>Jeffersonia diphylla</i>	Twinleaf	R
<i>Echinodorus berteroi</i> var. <i>lanceolatus</i>	Burhead	R	<i>Juglans cinerea</i>	Butternut	R
<i>Eleocharis wolfii</i>	Wolf's Spike Rush	R	<i>Juncus alpinoarticulatus</i>	Alpine Rush	E
<i>Elymus trachycaulus</i>	Bearded Wheat Grass	T	<i>Juncus articulatus</i>	Jointed Rush	R
<i>Epilobium strictum</i>	Downy Willow Herb	T	<i>Juniperus communis</i>	Common Juniper	T
<i>Equisetum variegatum</i>	variegated scouringrush	R	<i>Juniperus horizontalis</i>	Creeping Juniper; Carpet Juniper	E
<i>Erigenia bulbosa</i>	Harbinger of Spring	R	<i>Larix laricina</i>	American Larch	T
<i>Erigeron pulchellus</i>	Robin's Plantain	R	<i>Lathyrus oebroleucus</i>	Pale Vetchling	T
<i>Eriophorum angustifolium</i>	Cotton Grass	R	<i>Lechea intermedia</i>	Savanna Pinweed	T
<i>Eriophorum virginicum</i>	Rusty Cotton Grass	E	<i>Lespedeza leptostachya</i>	Prairie Bush Clover	E

Species Currently Monitored by Plants of Concern

Species	Common name	Status*	Species	Common name	Status*
<i>Lespedeza violacea</i>	Violet Bush Clover	R	<i>Platanthera psycodes</i>	Purple Fringed Orchid	E
<i>Liatris scariosa</i> var. <i>nieuwlandii</i>	Savanna Blazing Star	T	<i>Poa sylvestris</i>	Woodland Blue Grass	R
<i>Lonicera dioica</i>	Red Honeysuckle	R	<i>Pogonia ophioglossoides</i>	Snake-mouth Orchid	E
<i>Lycopodium clavatum</i>	Ground Pine	E	<i>Polygonatum pubescens</i>	Downy Solomon's Seal	E
<i>Lycopodium complanatum</i> var. <i>flabelliforme</i>	Trailing Ground Pine	R	<i>Polystichum acrostichooides</i>	Christmas Fern	R
<i>Lysimachia hybrida</i>	Lowland Yellow Loosestrife	R	<i>Populus balsamifera</i>	Balsam Poplar	E
<i>Malvastrum hispidum</i>	False Mallow	E	<i>Potamogeton robbinsii</i>	Fern Pondweed	E
<i>Medeola virginiana</i>	Indian Cucumber-root	E	<i>Potentilla palustris</i>	Marsh Cinquefoil	R
<i>Melanthium virginicum</i>	Bunch Flower	T	<i>Prenanthes aspera</i>	Rough White Lettuce	R
<i>Menyanthes trifoliata</i>	Buckbean, Bogbean	T	<i>Psoralea tenuiflora</i>	Scurfy Pea	R
<i>Minuartia patula</i>	Slender Sandwort	T	<i>Pycnanthemum pilosum</i>	Hairy Mountain Mint	R
<i>Mitella diphylla</i>	Bishop's Cap, Miterwort	R	<i>Pyrola elliptica</i>	Shinleaf	R
<i>Monotropa hypopithys</i>	Pine Sap	R	<i>Ranunculus rhomboideus</i>	Prairie Buttercup	T
<i>Monotropa uniflora</i>	Indian Pipe	R	<i>Rhus vernix</i>	Poison Sumac	R
<i>Napaea dioica</i>	Glade Mallow	R	<i>Rhynchospora alba</i>	White Beak Rush	T
<i>Oenothera perennis</i>	Small Sundrops	T	<i>Rubus odoratus</i>	Purple Flowering Raspberry	E
<i>Ophioglossum pusillum</i>	Northern Adder's Tongue Fern	R	<i>Rubus pubescens</i>	Dwarf Raspberry	T
<i>Orchis spectabilis</i>	Showy Orchis	R	<i>Rudbeckia fulgida</i> var. <i>sullivantii</i>	Showy Black-eyed Susan	R
<i>Orobanche uniflora</i>	One-flowered Cancer Root	R	<i>Sagittaria calycina</i>	Hooded Arrowhead	R
<i>Oryzopsis racemosa</i>	Black-Seeded Rice Grass	R	<i>Salix candida</i>	Hoary Willow, Sage Willow	R
<i>Panax quinquefolius</i>	Wild Ginseng	R	<i>Salix serissima</i>	Autumn Willow	E
<i>Parnassia glauca</i>	Grass of Parnassus	R	<i>Sanguisorba canadensis</i>	Canada Burnet	E
<i>Penstemon pallidus</i>	Pale Beard Tongue	R	<i>Sarracenia purpurea</i>	Pitcher Plant	E
<i>Penstemon tubaeformis</i>	Western Beard Tongue	E	<i>Saxifraga pensylvanica</i>	Swamp Saxifrage	R
<i>Physocarpus opulifolius</i>	Ninebark	R	<i>Scirpus hattorianus</i>	Early Dark Green Rush	E
<i>Pilea fontana</i>	Clearweed	R	<i>Scirpus microcarpus</i>	Reddish Bulrush	E
<i>Pinus banksiana</i>	Jack Pine	E	<i>Scleria verticillata</i>	Low Nutrush	R
<i>Plantago cordata</i>	Heart-leaved Plantain	E	<i>Scutellaria ovata</i> var. <i>versicolor</i>	Heart-leaved Skullcap	R
<i>Platanthera aquilonis</i>	Northern Green Orchid	R	<i>Shepherdia canadensis</i>	Buffalo Berry	E
<i>Platanthera ciliaris</i>	Orange Fringed Orchid	E	<i>Silene regia</i>	Royal Catchfly	E
<i>Platanthera clavellata</i>	Club-spur Orchid	E	<i>Silene virginica</i>	Fire Pink	R
<i>Platanthera flava</i> var. <i>herbiola</i>	Tuberclad Orchid	T	<i>Sisyrinchium campestre</i>	Prairie Blue-eyed Grass	R
<i>Platanthera hyperborea</i> var. <i>huronensis</i>	Northern Bog Orchid	R	<i>Sisyrinchium montanum</i>	Mountain Blue-eyed Grass	E
<i>Platanthera lacera</i>	Ragged Fringed Orchid	R	<i>Spartanium emersum</i>	Green-fruited Bur Reed	E

Species Currently Monitored by Plants of Concern

Species	Common name	Status*	Species	Common name	Status*
<i>Spiranthes lacera</i> var. <i>gracilis</i>	Northern Slender Lady's Tresses	R	<i>Zizania aquatica</i>	Wild Rice	R
<i>Spiranthes lucida</i>	Early Ladies' Tresses	E			
<i>Spiranthes ovalis</i>	October Lady's Tresses	R			
<i>Stellaria pubera</i>	Great Chickweed	E			
<i>Swertia carolinensis</i>	American Columbo	R			
<i>Symphoricarpos albus</i> var. <i>albus</i>	Snowberry	E			
<i>Tetraneuris herbacea</i>	Lakeside Daisy	E			
<i>Thuja occidentalis</i>	Eastern White Cedar	R			
<i>Tofieldia glutinosa</i>	False Asphodel	T			
<i>Tomanthera auriculata</i>	Eared False Foxglove	T			
<i>Trientalis borealis</i>	Starflower	E			
<i>Trifolium reflexum</i>	Buffalo Clover	T			
<i>Triglochin maritima</i>	Common Bog Arrow Grass	T			
<i>Triglochin palustris</i>	Slender Bog Arrow Grass	T			
<i>Trillium cernuum</i>	Nodding Trillium	E			
<i>Trillium erectum</i>	Purple Trillium	E			
<i>Trillium sessile</i>	Toad Trillium	R			
<i>Utricularia cornuta</i>	Horned Bladderwort	E			
<i>Utricularia gibba</i>	Humped Bladderwort	R			
<i>Utricularia intermedia</i>	Flat-leaved Bladderwort	T			
<i>Utricularia minor</i>	Small Bladderwort	E			
<i>Utricularia subulata</i>	zigzag bladderwort	R			
<i>Vaccinium corymbosum</i>	Highbush Blueberry	E			
<i>Vaccinium oxycoccos</i>	Small Cranberry	E			
<i>Valeriana edulis</i> var. <i>ciliata</i>	Common Valerian	R			
<i>Valeriana uliginosa</i>	Bog Valerian	E			
<i>Valerianella umbilicata</i>	Northern Corn Salad	E			
<i>Veronica comosa</i>	Water Speedwell	R			
<i>Veronica scutellata</i>	Marsh Speedwell	T			
<i>Viola blanda</i>	Hairy White Violet	E			
<i>Viola canadensis</i>	Canada Violet	E			
<i>Viola conspersa</i>	Dog Violet	T			
<i>Viola pallens</i>	Smooth White Violet	R			
<i>Viola striata</i>	Cream Violet	R			

Partner Landowners and the Number of EOs Monitored on their Property in Each Year

State	County	Land Owner	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
IL	Cook	Calumet Memorial Park District						1	2					
IL	Cook	Chicago Park District	4	8	8	9	11	13	19	11	11	8	8	15
IL	Cook	Chicago Park District/Sheridan Lakeside Condominium Association and Owners	1		3	3	3	3	3	3	3		3	
IL	Cook	Chicago Park District/Surfside Condominium Association	3	3	3	3	4	4	4	4	3		3	
IL	Cook	City of Evanston					2	2	2	3	3			
IL	Cook	Civic Center Auth of I&M Canal Natl Herit Corridor	3	3	4	4	3	4	4	3				4
IL	Cook	Commonwealth Edison/Giannakas Family												1
IL	Cook	Deerfield Associates				2	2		2		2	2		2
IL	Cook	FPD Cook County	12	19	14	54	88	83	111	123	136	142	133	114
IL	Cook	FPD Cook County and City of Elgin	11	8	14	23	16	10	15	17	13	16	16	13
IL	Cook	Glenbrook School District 225						3	2	1			3	
IL	Cook	Glencoe Park District				1								
IL	Cook	Glenview Park District	1	2	3	3	3	3	3	3	3	3	3	3
IL	Cook	IDNR		3	1	1	3	3	3	3	3		1	3
IL	Cook	MWRD	1											
IL	Cook	Nicole Williams/Larry Becker								4	5	5	5	1
IL	Cook	Northwestern University					1	5	4	5	5	6	2	
IL	Cook	Oak Lawn Park District	2	2	2	2	2	2	2		2	1		2
IL	Cook	Oakton Community College				4	3	3	5	6	5	6		4
IL	Cook	Palatine Park District + MWRD	1	1	1	1	1	1	1	1	1	1	1	
IL	Cook	Privately Owned 2						1	1	1	1	1		
IL	Cook	Privately Owned 4												
IL	Cook	Public Utility Company												3
IL	Cook	Rich Township												
IL	Cook	TNC	1	1	1	2	2	2	2	6	4	6	7	6
IL	Cook	TNC, Northeastern IL Univ	2	1	1	1	1	3	2	5	4	5	3	5
IL	Cook	Village of Westchester	1	1		1	1	1	1	1	1		1	2
IL	Cook	Village of Wilmette											1	
IL	Cook	Village of Winnetka				6	3		6	6	3			
IL	Cook	Wilmette Park District									3	3	3	3
IL	DuPage	Downer's Grove Park District	7	7	5	5	1	8	6	13	10	8	7	8
IL	DuPage	FPD DuPage County	30	53	44	72	35	105	99	105	99	108	103	84
IL	DuPage	IDNR		1		1		3	1	1	2	1	2	1
IL	DuPage	Naperville Park District							1	1	1		2	3
IL	DuPage	The Joliet Diocese of the Catholic Church											1	
IL	Kane	Burlington Township							1	1	1		1	
IL	Kane	Chicago Title and Trust		3										

Partner Landowners and the Number of EOs Monitored on their Property in Each Year

State	County	Land Owner	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
IL	Kane	City of Elgin		7	5	4	4	4	3	3	3	2	3	4
IL	Kane	DeSanto Family											1	
IL	Kane	Dundee Township		2	2	2	1	3	3	4	6	8	6	9
IL	Kane	FPD Kane County	12	3	7	18	26	19	25	26	23	20	26	24
IL	Kane	FPD Kane County/City of Elgin												
IL	Kane	FPD Kane County/ComEd	1	1		1	1	1	1	1		1	1	1
IL	Kane	Glen Speigler		1	1	1				1		1		
IL	Kane	Loyal Order of Moose		3	3				3		3		4	
IL	Kane	Shaw Family										3	3	3
IL	Kane	St. Charles Park District	1		1	1	1	1	1	1		1	1	
IL	Kane	TNC												
IL	Kane	US Department of Energy									3	7	7	10
IL	Kankakee	Marianne Hahn		1						1				
IL	Kankakee	TNC											1	
IL	Kendall	FPD Kendall County									11	9	12	11
IL	Kendall	IDNR												1
IL	Kendall	Privately Owned 1												
IL	Lake	CD McHenry County			2		2		1	5	2	3	2	1
IL	Lake	City of Lake Forest								3		16	3	7
IL	Lake	City of Waukegan/North Shore Sanitary/Midwest Generation/Johns Manville			2	2	4	4	4			4	13	40
IL	Lake	City of Zion						1	1					
IL	Lake	Commonwealth Edison			2	3	3	4	4	4	4	4	3	4
IL	Lake	Dewitt Family											1	1
IL	Lake	FPD Cook County												
IL	Lake	FPD Lake County	14	55	70	61	63	98	67	106	94	80	117	111
IL	Lake	FPD Lake County and Citizens for Conservation								3				
IL	Lake	FPD Lake County/RR Right of Way	2	2	2	1	2			1		1		
IL	Lake	Highland Park/Park District			2	5	8	11	8	12	12	10	4	5
IL	Lake	IDNR	3	5	9	9	15	17	20	21	29	29	18	43
IL	Lake	IDNR + Zion Park District				4	4	7	5	10	6	10	2	5
IL	Lake	IDNR/Commonwealth Edison											7	12
IL	Lake	IDOT						1	1			2		
IL	Lake	Jerry Kolar								1	1	1	1	1
IL	Lake	Lake Barrington Community Homeowner's Association							1	3	3			
IL	Lake	Lake Forest Open Lands Association		6				8	9	10			4	
IL	Lake	Libertyville Township						2	4	4	4	3		1
IL	Lake	North Shore School District 112				2	2	2	2	2	2	2	2	2

Partner Landowners and the Number of EOs Monitored on their Property in Each Year

State	County	Land Owner	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
IL	Lake	Openlands										39	18	27
IL	Lake	Rendl Family									1	1	1	1
IL	Lake	The Long Grove Park District	2	2	2	2	2	4	5	6	5	5	4	4
IL	Lake	Village of Barrington								3	2			
IL	Lake	Village of Lincolnshire	2	5	6	11	9	8	15	12	11	14	12	7
IL	Lake	Village of North Barrington					2		2	3	3			1
IL	Lake	Waukegan Park District									1		16	24
IL	Lake	Zion Park District								1	1	1	1	1
IL	McHenry	Bailey Family			1		1							
IL	McHenry	Blair Family		1	1	1	1	1		1				
IL	McHenry	Boone Creek Watershed Alliance						3	2	3	3	3		3
IL	McHenry	Cary Park District										4	5	2
IL	McHenry	Cary School Distrct												
IL	McHenry	CD McHenry County		1	3	12	24	17	41	47	49	55	66	50
IL	McHenry	CD McHenry County/Marty Papanek	1						7	7	5	5	6	6
IL	McHenry	City of Woodstock												
IL	McHenry	Dale Shriver									1	1	1	2
IL	McHenry	IDNR								2	2	3	2	6
IL	McHenry	IDNR/Village of Lake in the Hills	3	10	8	11	33	15	24	37	28	51	37	44
IL	McHenry	Jack and Maurine Kaskel												
IL	McHenry	Jeanine Damman											1	
IL	McHenry	John Clemetsen						5	6	6	6	6	7	1
IL	McHenry	Keenan Family								1	1	1	2	1
IL	McHenry	Lakowski Family										1	1	
IL	McHenry	Lora Petrak										1	2	
IL	McHenry	Lorna Gladstone						1	1	2	5	3	2	3
IL	McHenry	Marsh Familiy								2	2	4	6	4
IL	McHenry	Masi/D'Alessandro Family										1	1	1
IL	McHenry	Not Known												
IL	McHenry	O'Donnell Family			1			1		1				
IL	McHenry	Perle Olsson											8	
IL	McHenry	Rodney & Libby Aavang										1		
IL	McHenry	Staley Family						1		1				
IL	McHenry	Sue Tauck												4
IL	McHenry	The Land Conservancy of McHenry County												
IL	McHenry	TNC												
IL	McHenry	Tom Burroughs		1	1	1	1			1	1	1	1	

Partner Landowners and the Number of EOs Monitored on their Property in Each Year

State	County	Land Owner	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
IL	McHenry	Village of Oakwood Hills					2	2	3	4	4	4	4	
IL	Will	Andrew Blackburn											1	1
IL	Will	Commonwealth Edison											1	
IL	Will	FPD Will County		2	2	15	21	17	15	16	20	22	22	19
IL	Will	FPD Will County, IDNR, Villages of Park Forest and University Park			2		1	1	1	1	1	1	2	1
IL	Will	IDNR	1	6	6	6	6	8	8	10	10	6	6	13
IL	Will	IDNR + U.S. Forest Service		2	4	4		6	8	8	8	8	9	9
IL	Will	Joliet Park District								1	2	3	3	2
IL	Will	Lockport Township Park District/FPD Will County				4	2	2	3	2	3	3	4	5
IL	Will	Michel-Perry Family									1		1	
IL	Will	Naperville Park District												1
IL	Will	Nelsons										1	1	1
IL	Will	Plainfield Park District			1	1	1	1	1			1	2	
IL	Will	Privately Owned 1										1	1	
IL	Will	U.S. Forest Service	1	3	11	23	25	29	29	28	19	25	19	23
IL	Will	U.S. Forest Service/IDNR	1	2	2	2	2	2	3	3	3	3	3	3
IN	Lake	INDNR											1	1
IN	Lake	Save the Dunes Conservation Fund											1	2
IN	Lake	Shirley Heinze Land Trust						1					7	4
IN	LaPorte	Shirley Heinze Land Trust											1	2
IN	Newton	TNC												
IN	Porter	Dawson Family											2	1
IN	Porter	Mohar Family											2	2
IN	Porter	National Park Service						2	1	3			7	4
IN	Porter	Save the Dunes Council												1
IN	Porter	Shirley Heinze Land Trust											6	2
IN	Porter	Susan Swanson et.al.							1	1				
WI	Kenosha	Chiwaukee Prairie State Natural Area Landowners							15	12	24			2
WI	Walworth	TNC							11	18	31	24	4	
WI	Walworth	WDNR							5	10	18	5	2	
WI	Waukesha	Heidi and Dan Natura							2	1	2	1	1	1

The number of EO's of POC Monitored Species in Each County

Species	Status	Cook IL	DuPage IL	Kane IL	Kankakee IL	Kendall IL	Lake IL	McHenry IL	Will IL	Lake IN	LaPorte IN	Newton IN	Porter IN	Kenosha WI	Walworth WI	Waukesha WI	# counties
<i>Actaea rubra</i>	R	2		2			5						2				4
<i>Adiantum pedatum</i>	R		4	2		1	3	3					1				6
<i>Agalinis skinneriana</i>	T	2					2							1			3
<i>Alnus rugosa</i>	E							2									1
<i>Amelanchier interior</i>	T	3	6	1			1										4
<i>Amelanchier sanguinea</i>	E	2					1										2
<i>Ammophila breviligulata</i>	E	11					6										2
<i>Andromeda glaucophylla</i>	R						1										1
<i>Arabis hirsuta</i>	R		2														1
<i>Aralia hispida</i>	R												1				1
<i>Aralia racemosa</i>	R						3										1
<i>Arctostaphylos uva-ursi</i>	E	1					2										2
<i>Aristolochia serpentaria</i>	R		5	1													2
<i>Artemisia serrata</i>	R			2													1
<i>Asclepias amplexicaulis</i>	R			2				1									2
<i>Asclepias exaltata</i>	R	1		1			7	3	1								5
<i>Asclepias hirtella</i>	R	1	1											1			3
<i>Asclepias lanuginosa</i>	E	3		1				3									3
<i>Asclepias meadii</i>	E		1														1
<i>Asclepias ovalifolia</i>	E	1													1		2
<i>Asclepias perennis</i>	R								1								1
<i>Asclepias purpurascens</i>	R													1	2		2
<i>Asclepias viridiflora</i>	R	1	5	5				1						1	2		6
<i>Aster furcatus</i>	T	2		3			5	2							1		5
<i>Baptisia leucophaea</i>	R	1	5				1										3
<i>Baptisia tinctoria var. crebra</i>	R				1												1
<i>Beckmannia syzigachne</i>	E	4															1
<i>Besseyia bullii</i>	T	1		1											1	1	4
<i>Betula alleghaniensis</i>	E						1			1			1				3
<i>Betula papyrifera</i>	R						6										1
<i>Betula populifolia</i>	R								1								1
<i>Bidens discoidea</i>	R		4														1
<i>Bolboschoenus maritimus</i>	R		3														1
<i>Botrychium campestre</i>	E			1													1
<i>Botrychium matricariifolium</i>	E												1				1
<i>Cacalia plantaginea</i>	R	1												1			2
<i>Cakile edentula</i>	T	17					7										2

The number of EO's of POC Monitored Species in Each County

Species	Status	Cook IL	DuPage IL	Kane IL	Kankakee IL	Kendall IL	Lake IL	McHenry IL	Will IL	Lake IN	LaPorte IN	Newton IN	Porter IN	Kenosha WI	Walworth WI	Waukesha WI	# counties
<i>Callitriche heterophylla</i>	R		4														1
<i>Callitriche palustris</i>	R		3														1
<i>Calopogon oklahomensis</i>	E								1								1
<i>Calopogon tuberosus</i>	E	7					5	5	1					1			5
<i>Cardamine pratensis var. palustris</i>	E							2									1
<i>Carex alata</i>	E								1								1
<i>Carex aurea</i>	T	6		1			8						1				4
<i>Carex bromoides</i>	T	5	1				7										3
<i>Carex brunnescens</i>	E						2										1
<i>Carex canescens var. disjuncta</i>	E						2										1
<i>Carex chordorrhiza</i>	E						1										1
<i>Carex conoidea</i>	R	1															1
<i>Carex cravei</i>	R	3	3	1			1		4					1			6
<i>Carex cranfordii</i>	E	1															1
<i>Carex crus-corvi</i>	R		5				1										2
<i>Carex cryptolepis</i>	E	1	1				3	2									4
<i>Carex cumulata</i>	E				4												1
<i>Carex disperma</i>	E						2										1
<i>Carex echinata</i>	E						1										1
<i>Carex formosa</i>	E	5					1										2
<i>Carex frankii</i>	R	1	8														2
<i>Carex garberi</i>	E						1										1
<i>Carex gracilescens</i>	R	1	2														2
<i>Carex intumescens</i>	T	2					1										2
<i>Carex leptalea</i>	R	1					1										2
<i>Carex oligosperma</i>	E			1				1									2
<i>Carex pedunculata</i>	R						2										1
<i>Carex richardsonii</i>	R		1											1			2
<i>Carex trisperma</i>	E						2										1
<i>Carex tuckermanii</i>	E		4				2										2
<i>Carex umbellata</i>	R		1				2										2
<i>Carex utriculata</i>	R		1														1
<i>Carex viridula</i>	T	3	5				5	3	1					1			6
<i>Carex woodii</i>	T	3	7			2	7		2								5
<i>Cassia hebecarpa</i>	R	2	1														2
<i>Castilleja coccinea</i>	R								1								1
<i>Castilleja sessiliflora</i>	E						2										1

The number of EO's of POC Monitored Species in Each County

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<i>Ceanothus americanus</i>	R	1					2										2
<i>Ceanothus herbaceus</i>	T						1										1
<i>Chamaedaphne calyculata</i>	T			1			2	2		1							4
<i>Chamaesyce polygonifolia</i>	E	13					7										2
<i>Cicuta bulbifera</i>	R		6														1
<i>Cimicifuga racemosa</i>	E	1					1	1									3
<i>Cirsium billii</i>	R		5	2				7	2								4
<i>Cirsium pitchei</i>	T	4															1
<i>Cladium mariscoides</i>	R						1										1
<i>Collinsia verna</i>	R		1	1													2
<i>Comptonia peregrina</i>	E	2			1							1					3
<i>Conoposis americana</i>	R	4		1			4		1				1				5
<i>Corallorhiza maculata</i>	T							2	3								2
<i>Corallorhiza odontorhiza</i>	R			1													1
<i>Cornus rugosa</i>	R						4										1
<i>Corydalis aurea</i>	E								1								1
<i>Cypripedium calceolus var. parviflorum</i>									1								1
<i>Cypripedium calceolus var. pubescens</i>	R						2	2		1			1		2		5
<i>Cypripedium candidum</i>	T	15	8	5			7	22	3						3		7
<i>Cypripedium parviflorum var. makasin</i>	E	1					2	5						1	1		5
<i>Cypripedium reginae</i>	E			1			3										2
<i>Cypripedium x andrewsii</i>	R							2							2		2
<i>Dalea foliosa</i>	E	2	1						1								3
<i>Delphinium tricorne</i>	R	1															1
<i>Desmodium canescens</i>	R		4														1
<i>Desmodium cuspidatum</i>	R		3														1
<i>Diarrhena americana</i>	R	1	2	1			1										4
<i>Dichantheium boreale</i>	E	1															1
<i>Diervilla lonicera</i>	R	2	1				4										3
<i>Dirca palustris</i>	R			3													1
<i>Drosera intermedia</i>	T	2		1	1				1								4
<i>Drosera rotundifolia</i>	E						2	2									2
<i>Dulichium arundinaceum</i>	R			1													1
<i>Echinodorus berteroi var. lanceolatus</i>	R			1													1
<i>Eleocharis olinacea</i>	E	1															1
<i>Eleocharis pauciflora</i>	E						1	1									2
<i>Eleocharis rostellata</i>	T							6									1

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<i>Eleocharis wolfii</i>	R						1										1
<i>Elymus trachycaulus</i>	T	2	1				2										3
<i>Epigaea repens</i>	R												1				1
<i>Epilobium strictum</i>	T						2	3	1								3
<i>Equisetum variegatum</i>	R						2										1
<i>Erigenia bulbosa</i>	R								1				1				2
<i>Erigeron pulchellus</i>	R		3					1									2
<i>Eriophorum angustifolium</i>	R		2	2				2						1			4
<i>Eriophorum virginicum</i>	E						2	1									2
<i>Erythronium americanum</i>	R	1	1				1		1				1				5
<i>Eupatorium sessilifolium var. brittonianum</i>	R		1														1
<i>Festuca paradoxa</i>	R								1								1
<i>Fictitious species</i>	R	1															1
<i>Fictitious species2</i>		1															1
<i>Filipendula rubra</i>	E	2					1	5									3
<i>Fimbristylis puberula</i>	R				1									1			2
<i>Galium labradoricum</i>	R						6	3									2
<i>Gentiana flavida</i>	R	2	3				3	1							2	1	6
<i>Gentiana procera</i>	R						1							1			2
<i>Gentiana puberulenta</i>	R									1							1
<i>Gentianopsis crinita</i>	R	2		1			4						1	1			5
<i>Geranium bicknellii</i>	E	3					5										2
<i>Geum rivale</i>	R			1													1
<i>Geum triflorum</i>	R	1		1			1							1			4
<i>Goodyera pubescens</i>	R		2	1				1		1							4
<i>Gratiola quartermaniae</i>	E								2								1
<i>Helianthus giganteus</i>	E	1						1	1								3
<i>Hepatica nobilis var. obtusa</i>	R						9										1
<i>Hudsonia tomentosa</i>	E												1				1
<i>Hybanthus concolor</i>	R	1							1								2
<i>Hydrastis canadensis</i>	R	3	1	2			2		1								5
<i>Hymenopappus scabiosaeus</i>	T				2												1
<i>Hypericum adpressum</i>	E								2								1
<i>Hypericum kalmianum</i>	E	1					6							1			3
<i>Hypericum swinkianum</i>	R	2															1
<i>Ilex verticillata</i>	R	1	1				1										3
<i>Iliamna remota</i>	E		1														1

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<i>Iodanthus pinnatifidus</i>	R	1	2				1		1								4
<i>Isoetes butleri</i>	E		1						4								2
<i>Jeffersonia diphylla</i>	R	2		1		1	1	1	1				1				7
<i>Juglans cinerea</i>	R	2	16			1	3		1								5
<i>Juncus alpinoarticulatus</i>	E	1	2	2			3	1	1								6
<i>Juncus articulatus</i>	R		1														1
<i>Juncus scirpoides</i>	R												1				1
<i>Juniperus communis</i>	T	3					5										2
<i>Juniperus horizontalis</i>	E						1										1
<i>Larix laricina</i>	T						4										1
<i>Lathyrus ochroleucus</i>	T	1	1				11	8						1			5
<i>Lechea intermedia</i>	T			2				2									2
<i>Lespedeza leptostachya</i>	E	2						2									2
<i>Lespedeza violacea</i>	R						4										1
<i>Liatris scariosa var. nienwandii</i>	T	10		1					2	1							4
<i>Lonicera dioica</i>	R	1					3										2
<i>Lupinus perennis</i>	R				2												1
<i>Lycopodium clavatum</i>	E		1							1							2
<i>Lycopodium complanatum var. flabelliforme</i>	R		8	1						1							3
<i>Lycopodium obscurum</i>	R									1							1
<i>Lycopodium tristachyum</i>	R									1							1
<i>Lycopus rubellus</i>	R			1													1
<i>Lycopus virginicus</i>	R	2															1
<i>Lysimachia hybrida</i>	R		1														1
<i>Malvastrum hispidum</i>	E								1								1
<i>Medeola virginiana</i>	E	1								1	1						3
<i>Megalodonta beckii</i>	E						3										1
<i>Melanthium virginicum</i>	T			1													1
<i>Menyanthes trifoliata</i>	T			2			4	3									3
<i>Mimuartia patula</i>	T	2	1						4								3
<i>Mitella diphylla</i>	R	1		1		1	7	1					1				6
<i>Monotropa hypopithys</i>	R						1										1
<i>Monotropa uniflora</i>	R						3	1					1				3
<i>Morus rubra</i>	R		1														1
<i>Muhlenbergia cuspidata</i>	R			1													1
<i>Napaea dioica</i>	R								1								1
<i>Oenothera perennis</i>	T	13	1				11	1	1	1							6

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<i>Ophioglossum pusillum</i>	R	1	2														2
<i>Orchis spectabilis</i>	R		2					3									2
<i>Orobanche fasciculata</i>	E						1										1
<i>Orobanche uniflora</i>	R	1	3	1			4							1	1		6
<i>Oryzopsis racemosa</i>	R		1	1			4										3
<i>Panax quinquefolius</i>	R		5	1		2	2						1				5
<i>Parnassia glauca</i>	R						2	2						1			3
<i>Penstemon pallidus</i>	R		3											1			2
<i>Penstemon tubaeiflorus</i>	E		3														1
<i>Physocarpus opulifolius</i>	R						1										1
<i>Pilea fontana</i>	R	2				1											2
<i>Pinus banksiana</i>	E	1															1
<i>Plantago cordata</i>	E	1	1						1								3
<i>Platanthera aquilonis</i>	R	1															1
<i>Platanthera ciliaris</i>	E	1			1												2
<i>Platanthera clavellata</i>	E						1			1							2
<i>Platanthera flava var. herbiola</i>	T	1					5		3				1		1		5
<i>Platanthera hyperborea var. huronensis</i>	R		1					6									2
<i>Platanthera lacera</i>	R								1	1				1			3
<i>Platanthera psycodes</i>	E						4			1							2
<i>Poa sylvestris</i>	R		5				1										2
<i>Pogonia ophioglossoides</i>	E	1					4	3									3
<i>Polygonatum pubescens</i>	E	6	1				4	3		3	1						6
<i>Polygonum careyi</i>	E				1												1
<i>Polystichum acrostichoides</i>	R		2						1					1			3
<i>Populus balsamifera</i>	E	1							1								2
<i>Potamogeton robbinsii</i>	E						4										1
<i>Potentilla palustris</i>	R							2									1
<i>Prenanthes aspera</i>	R	4	1	1					1								4
<i>Psoralea tenuiflora</i>	R	1	2	1			1										4
<i>Pycnanthemum pilosum</i>	R		1														1
<i>Pyrola elliptica</i>	R	1	2	1			5	1					1				6
<i>Pyrola rotundifolia var. americana</i>	R												1				1
<i>Ranunculus rbomboides</i>	T	1		1				6									3
<i>Rhus vernix</i>	R			2				3					1				3
<i>Rhynchospora alba</i>	T							2									1
<i>Rubus odoratus</i>	E	1	1	2			4	5									5

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<i>Rubus pubescens</i>	T	4					4										2
<i>Rudbeckia fulgida</i> var. <i>sullivantii</i>	R								1								1
<i>Sagittaria calycina</i>	R			1													1
<i>Salix candida</i>	R		2	2													2
<i>Salix serissima</i>	E							1									1
<i>Salix syrticola</i>	E						1										1
<i>Sanguisorba canadensis</i>	E							2	1								2
<i>Sarracenia purpurea</i>	E						4	3									2
<i>Saxifraga pensylvanica</i>	R			1				3					1				3
<i>Schoenoplectus hallii</i>	T												1				1
<i>Scirpus hattorianus</i>	E		3			1	1										3
<i>Scirpus microcarpus</i>	E						4										1
<i>Scleria pauciflora</i> var. <i>pauciflora</i>	E				2												1
<i>Scleria verticillata</i>	R						2										1
<i>Scutellaria ovata</i> var. <i>versicolor</i>	R						6										1
<i>Shepherdia canadensis</i>	E						3										1
<i>Silene regia</i>	E	1		3													2
<i>Silene virginica</i>	R	4	3				1		1								4
<i>Sisyrinchium campestre</i>	R	1															1
<i>Sisyrinchium montanum</i>	E	13	1				1										3
<i>Sparganium emersum</i>	E		2	1				1									3
<i>Spiranthes lacera</i> var. <i>gracilis</i>	R			1			3										2
<i>Spiranthes lucida</i>	E	2		1					1								3
<i>Spiranthes magnicamporum</i>	R												1				1
<i>Spiranthes ovalis</i>	R	1		2			1	2					1				5
<i>Spiranthes romanzoffiana</i>	E							1									1
<i>Stellaria pubera</i>	E	1															1
<i>Swerdia caroliniensis</i>	R	2	1														2
<i>Symphoricarpos albus</i> var. <i>albus</i>	E			1													1
<i>Talinum rugospermum</i>	R				1												1
<i>Tetranneuris herbacea</i>	E	2	1						1								3
<i>Thuja occidentalis</i>	R			1			1										2
<i>Tofieldia glutinosa</i>	T	1					3	3						1	1		5
<i>Tomanthera auriculata</i>	T	12	3				1		4	1			1				6
<i>Trientalis borealis</i>	E	2					3	1		1	1						5
<i>Trifolium reflexum</i>	T								1								1
<i>Triglochin maritima</i>	T						4	3						1	1		4

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<i>Triglochin palustris</i>	T	1		2			2	5	1					1	1		7
<i>Trillium cernuum</i>	E	2					1	5	1						1		5
<i>Trillium erectum</i>	E						2	1									2
<i>Trillium flexipes</i>	R	1															1
<i>Trillium sessile</i>	R	1	2			1							1				4
<i>Ulmus thomasii</i>	E			1													1
<i>Utricularia cornuta</i>	E						1	2						1			3
<i>Utricularia gibba</i>	R							1									1
<i>Utricularia intermedia</i>	T	3		1			2	4									4
<i>Utricularia minor</i>	E	1						1									2
<i>Utricularia subulata</i>	R						1										1
<i>Vaccinium corymbosum</i>	E						2										1
<i>Vaccinium macrocarpon</i>	E							1									1
<i>Vaccinium oxycoccos</i>	E						2										1
<i>Valeriana edulis var. ciliata</i>	R		2				2		1					1			4
<i>Valeriana uliginosa</i>	E	1						2									2
<i>Valerianella umbilicata</i>	E								1								1
<i>Veronica americana</i>	E					1		1									2
<i>Veronica comosa</i>	R	1						2									2
<i>Veronica scutellata</i>	T	6	6	1			9	1	1	1							7
<i>Viburnum trilobum</i>							1										1
<i>Viola blanda</i>	E							1									1
<i>Viola canadensis</i>	E	1						1					1				3
<i>Viola conspersa</i>	T	8	1				11	2					1				5
<i>Viola pallens</i>	R						2										1
<i>Viola pedatifida</i>	R												1				1
<i>Viola striata</i>	R	2						1					1				3
<i>Zigadenus glaucus</i>	E														2		1
<i>Zizania aquatica</i>	R		1	1				1		1							4

PLANTS OF CONCERN: TRAINING WORKSHOP AGENDA

Wednesday, April 24, 2013: Chicago Botanic Garden (Cook County)
Plant Science Center
1000 Lake Cook Road, Glencoe, IL (see map)
9:30 a.m. – 3:00 p.m.

Morning coffee, tea and refreshments will be served. Please bring a lunch.
Dress for outdoor activities.

- **Welcome and Introductions**
- **Background on Plants of Concern, 2001- 2012: Purpose and Accomplishments**
Susanne Masi and Rachel Goad, Chicago Botanic Garden
- **Monitoring opportunities in McHenry County Conservation District**
Laurie Ryan, Plant Ecologist
- **Monitoring opportunities in Lake County Forest Preserve District**
Debbie Maurer , Assistant Manager of Natural Resources and Ecologist
- **Monitoring opportunities in Cook County Forest Preserve District**
Daniel Suarez, POC intern for Cook County FPD, Chicago Botanic Garden

BREAK

- **Review of common invasive species** (Susanne Masi and Rachel Goad)
- **New Invaders Watch Program** (Debbie Maurer, Northeast Illinois Invasive Plant Partnership)
- **Forays** (Susanne Masi)
- **How the POC program works:** Linking volunteers with POC, landowners, partners, sites and species; how to access equipment: GPS units, tapes, compasses; applications and permits (Susanne Masi)

LUNCH BREAK: Networking and exploring assignments

- **On-line form submission and POC website** (Bianca Rosenbaum)
- **Step by step introduction to Level 1 Monitoring – reviewing the protocols** (Susanne Masi)
- **Outdoor field exercises:** Separate into small groups to practice using the GPS unit, pacing, and measuring populations.
- **Sign-up for species, sites, partners, and forays**
- **Complete application forms, Confidentiality forms, Evaluation form**

Handouts

- POC Volunteer Training Manual
- Level 1 Monitoring Form
- Confidentiality Form
- CBG Volunteer Application Form/Background Check Letter
- Measuring/Counting Populations Exercise
- Pacing Exercise
- Evaluation Form

On table

- Sign-in spreadsheet – **please sign in with contact information and preferences**
- Agency application forms
- Foray sign-up sheets
- POC posters and articles; plant guides
- NIWP Herbarium specimens



**Plants of Concern Advisory Group Meeting
December 6, 2012
Chicago Botanic Garden**

In Attendance:

Juanita Armstrong – Will County FPD

Eric Ulaszek – Midewin National Tallgrass Prairie

Jason Steger – Chicago Park District

Rebecca Schillo – The Field Museum

Deborah Antlitz – Cook County FPD

Scott Kobal – DuPage County FPD

Cindy Hedges – DuPage County FPD

Jody Strohm – Kendall County FPD

Ken Klick – Lake County FPD

Aimee Collins – Openlands

Robb Cleave – Kane County FPD

Andy Olnas – Kane County FPD

Margo Milde – Contract Botanist for CAG

Katherine Johnson – GLRI Intern for CAG

Bill Lebensorger – GLRI Intern for CAG

Duane Ambroz – IDNR

Carol Freeman – POC Photographer

Attending by phone (for data sharing discussion):

John Wilker – IDNR

Tara Kieninger – Natural Heritage Database, IDNR

Jeannie Barnes – Natural Heritage Database, IDNR

Staff attending:

Susanne Masi

Bianca Rosenbaum

Justin Aaron

Rachel Goad

Emma Bialecki

Pati Vitt

Introductions and welcome

Susanne's presentation: Plants of Concern Preliminary Summary of Accomplishments. Updates and summary stats over 11 years on species, site, EOR, landowner, and volunteer numbers; threats and invasive species; management stories.

See attached Overview presentation.

Discussion

Discussion of Japanese stilt grass in reference to the population that Rachel Goad and monitor Dennis Dreher discovered

Cindy: How large was the population?

Rachel: Population was fairly small, only a few plants. Some plants were also found by MCCD District at another site where they were actively managing for it.

Scott and Eric agreed that this invasive can be aggressive and we all should be on the lookout for it.

Bianca's presentation: Website Status Update. New website look, new server and spatial database, and issues encountered.

See attached Website presentation.

Discussion

Debbie: Will there be downtime while the server and the website are updated?



Bianca: Won't be the same for everyone. A month for administrators, then land managers, then monitors. By February or March we should be done transferring everyone and moving admins (administrative access). If you need data during a projected downtime we can work with you to get you data when you need it.

Cindy: On the new website, can you retrieve or edit a form once it's been submitted?

Bianca: You will be able to edit until you have submitted the form for review.

Susanne: Once a form is submitted it can't be corrected or we will have multiple versions of a report in our database. We will continue with our system where you can email us to make corrections after a form is submitted.

Cindy: That's fine. We can be in direct contact.

Bianca: Possible solution/suggestion: could make a "Message Box" where monitors can enter mistakes or improvements for staff to update rather than use email

Debbie: Is there a way to make land management entry easier and more dynamic?

Bianca: We hoped the changes we made to the online land management form would do that. You can now enter land management information online as you have it, no need to submit a comprehensive form for each management event.

Justin's presentation: Monitoring Rare Plants in Rare Areas at Midewin National Tallgrass Prairie, 2001-2012. MNTP/POC program overview, with an emphasis on effects of climate (drought and high temperatures) on species during the 2012 season.

See attached Midewin presentation.

Discussion

Becky Schillo: How did *Tomanthera* populations do in places other than Midewin, where you have level 2 plots?

Susanne: Numbers were up for level 1 monitoring of most *Tomanthera* populations across the region.

Eric: *Malvastrum hispidum* numbers also were up this season, despite the drought.

Justin: The dry weather in 2012 may have decreased competition that allowed late season species like *Malvastrum* and *Tomanthera* to increase.

Ken Klick: How long do *Tomanthera* live? This might clarify a height difference.

Eric: Since it's an annual species, the question is when does it germinate?

Justin: Perhaps they germinated later this year which mitigated the drought.

Eric: Do we need to measure height for *Tomanthera*?

Pati: Yes, height is useful, especially in the absence of deer browse. It correlates strongly with measures of plant fitness.

Justin: Described level 2 procedures for *Tomanthera*. We closely track individuals.

Cindy: Was there a difference between early and late blooming species production this year?

Justin: We did see a lot of stunted plants this spring. Very early species were affected by late season frost.

Juanita: When did the drought start this year?

Justin: No good rain until August at Midewin.



Ken: You showed a photo of *Tomanthera* with a caterpillar – was that the buckeye caterpillar? I have seen it wipe out *Agalinis* populations

Eric: Yes, that caterpillar is very common on site, and eats many other things too. No need to start controlling it as there would be effects on many other species. Its abundance may indicate that something else is going on.

Eric: (To Pati): Can you clarify about collecting height data on *Tomanthera*? Does it serve a purpose?

Pati: Yes, it tightly correlates with fecundity and gives a sense of the structure of the size population.

Eric: Do we not need to count flowers, then?

Pati: You could get away with not counting flowers, but I don't recommend that.

Eric: Is there any correlation for *Isoetes* between leaves and survival from year to year?

Susanne: So far we have found no strong correlation.

Ken: When does *Tomanthera* germinate?

Eric: Spring. Also is purported to be a hemiparasite, but we can't get it to germinate successfully enough to study its roots and haustoria.

Ken: What about the *Festuca paradoxa* you're monitoring? What habitat does that occur in?

Eric: It is widely considered rare, but is more common downstate. Found in multiple habitat types. Sedge meadow at Midewin.

Emma's presentation: Plants of Concern: The Forest Preserve District of Cook County. Overview of CCFPD-POC program since 2004, with an emphasis on GIS mapping of populations.

See attached Cook County/ GIS presentation.

Discussion

Juanita: Are we getting rid of points? Creating large polygons out of small points could misrepresent data, especially in the case of outliers.

Pati: We will use a buffer around small points to create a polygon.

Rachel: Do you mean multiple individual plant instances within the same subpopulation?

Pati: We encourage monitors to indicate on the monitoring form when outlying plants occur.

Emma: We also intend to edit the online form to allow monitors to submit more GPS readings, if they have them, instead of putting additional readings in the notes.

Susanne: This will be completely optional, as we don't want to overburden volunteers, but some already do this in the notes section and we don't have a way of querying for that information.

Pati: Also, a polygon that includes outlying plants may be indicating the true population extent. Sometimes we may miss intermediate plants.

Debbie: Will point readings still be available? Will the database be different in any other way?

Emma: All of the information will remain in the database, but a polygon will be added to each report.

Debbie: This will be useful from a management and planning standpoint.

Rachel's presentation: Data Analysis Update and Feedback Session. Overview of POC's analysis approaches over the past years, including Population Viability Analyses; emphasis on potential for analysis using



orchid species as a model; graph showing 2012 bloom dates in comparison to previous years and to Swink and Wilhelm's median bloom times.

See attached Data analysis presentation.

Discussion

Rachel opened up the floor to questions and to discuss ideas and recommendations for future analyses and steps to take to provide managers and owners with preferred information.

Eric: It would be useful to know what species are doing within the land managers/owners region. For example, are other similar, nearby sites experiencing the same trends? Are they different? If so, is one site anomalous and why? Also, if other sites in the area are seeing a decline in a certain species, and if so should we monitor that species at our site?

Rachel: So we should determine an efficient medium to communicate this type of information (i.e. regional trends)?

DuPage Team: (Agree) Overall changes in region, on a specific site; other trends would be great to have.

Ken: We would like to know the probability of species reaching extinction. Having specific scientific backing on this (and visual representation) would be useful in implementing more drastic management tactics, rather than just brush cutting, herbaceous removal, and burning.

Becky: Examples of success stories are powerful, especially for support of restoration work. Is there information, or worth getting the information, on the genetics of species at fragmented/urbanized sites?

Rachel: It is beyond the scope of POC, but graduate students seem very interested in exploring the genetics of rare species

Becky: This would help us figure out why species are declining. Refers to rare species seed transfer between sites.

Cindy: Would somehow like to guide management through information sharing.

Juanita: Like some sort of listserv or group?

DuPage Team: There is not much information on herbicide application.

Susanne: That information is supplied on the LM forms.

DuPage Team: So LM forms have not been analyzed yet or are they too incomplete?

Susanne: Both. 44% of all populations have at least 1 LM report, though some have multiples

Carol: In reference to the deer browsing, has noticed that many of the listed species have been caged (especially orchids).

Rachel: We don't have access to this information readily, unless it's reported in the notes section. We would like to incorporate it, but since it is not constant, it becomes difficult to assign a value to this.

Scott: Some species have been caged heavily in the past, so current reporting does not accurately reflect deer browsing threat to that species because plants are protected!

Cindy: It would be good to learn which is more effective, individual management activities, or combined management, such as burning and clearing.

Following this discussion, Pati Vitt joined in to give her take on the current status of the program and ideas she has for the upcoming season. We (POC) all should try to meet on a semi-regular basis in the offseason to generate questions, determine appropriate applications for the concerns raised today, get regular feedback on activities, and to discuss how we will use the data and how it can guide our analyses.



Example – any missing information we come across in queries can guide goals for the next season; with enough data we can do count-based PVAs, with management included; some species have more data than others

Susanne: Our goal with this discussion (and feedback through emails) is to set priorities for our research analysis, since we can't do it all. We need to know what managers want to see analyzed.

Eric: Is there enough data to look at the decline of certain species and apply genetic analysis if we don't know why there is a decline

Pati: Possibly, using count and breeding system. Pati and Jeremie Fant are developing a model using *Cirsium hillii* to analyze regional trends. Data cleanup to make them compatible with the model, however, is a time consuming part of this process.

Rachel: If there are risk factors we can quantify, we can maybe apply these.

Program partners and discussion

-**Carol Freeman** presented her work and asked how she might be involved with helping other regional conservation groups with outreach through photography. Her philosophy is to give a beautiful face to the plants we are monitoring to capture people's attention and support. She brought copies of her 2013 calendar (some of the proceeds will go to POC), bookmarks and other items to sell.

-**Susanne discussed POC's involvement in numerous special projects across the region.** Three of them have been focused in north shore ravine habitats.

(1) POC has been working at Openlands since 2010, coordinating monitoring of rare, threatened, and endangered plants, sampling vegetation transects, mapping invasive species and plant communities, monitoring bird monitoring, macroinvertebrate sampling, and canopy photography.

(2) POC has also been working in Waukegan with the Citizens Advisory Group (CAG) who got Great Lakes Restoration Initiative (GLRI) funding to work intensively in lakeshore and ravine habitats in Waukegan. POC has provided rare plant monitoring expertise, through training volunteers and interns and providing direct field assistance. Margo Milde, along with interns on the project and POC staff have documented more than 30 species which are new occurrences in the POC database for these sites.

(3) Lastly, POC has been involved with a project called Sustain our Great Lakes which is funded by a National Fish and Wildlife Foundation grant to the Alliance for the Great Lakes. POC has done extensive rare plant monitoring, assisted with vegetation transects, and taken light readings in the ravines at Ft. Sheridan, as well as assisting with a project to create rapid assessment protocols for land owners to evaluate the quality of their ravines.

-**POC has fostered partnerships with graduate student researchers.** Currently there are two students working on POC species – *Isoetes butleri* and *Cypripedium candidum* are the focus of these students' thesis projects.

-Data sharing protocol

Because more researchers are requesting to work with POC and POC data, a protocol/policy is needed to guide the sharing of data. POC is committed to protecting the confidentiality of locations of rare species and volunteers sign a confidentiality statement. Susanne passed around a draft agreement for requesters of data for discussion.

***The Natural Heritage Database staff phoned in for this discussion, since they regularly deal with sharing sensitive data.**

Data Sharing Discussion



John: some items are lacking in the POC form that are in the NHD agreement, such as the consequences for breaking a confidentiality promise, non-transferability of data, and an agreement to destroy the data after a certain time period (NHD generally gives a year unless the agreement is renewed.)

There will not be an overlap with both POC and the NHD sharing data. NHD has pre-2001 data that will be useful to researchers.

Tara: Landowners need to be involved in the permitting process for sharing data. Landowners are the only ones to provide access to sites, IDNR or POC can't do that.

Cindy: DuPage has a staff review of all permit requests and asks for followup reports.

Margo, Cindy: There may be an issue of overharvesting by researchers (in the field).

Tara: There is a question of how the data would be shared and who would have access to it. There are levels of data, and landowners may give the option of sharing some but not all. Also, researchers should be asked to share new data back to POC if it becomes available during their work.

Pati: Is there a time limit on keeping data. NatureServe requires this.

Tara: One year is typical for the data license agreement, can be renewed. Also, consider the question of indemnification of POC if researchers go on site.

The NHD is reviewing their licensing agreement for data sharing and will send a copy of the draft (attached) for POC to consider in developing its own agreement. They are also working on a fee structure for data requests but may give waivers or reductions to conservation partners. They don't want to present hurdles to legitimate conservation research.

Reminders/other topics

Susanne suggested that POC **clarify the benefit of collecting land management data** from land managers by analyzing the difference between land management data from monitoring forms versus management data on monitoring forms.

Spring workshops are not yet planned, but will be scheduled early in 2013 and advertised on the POC website and in volunteer newsletters. Midewin offered to host one workshop.

Winter meetings with partner land managers at their sites will be planned in early January – Susanne will send out a notice with scheduling options.

Susanne is soliciting suggestions about the **ET listing** for Illinois currently being revised by the Endangered Species Protection Board – reference the list of current 'rare' plants monitored by POC. Provide comments or suggestions about listing any of these in Illinois. She will send out Eric's annotated list for others to review or add comments to and will bring any species to the Board's attention that seem to warrant consideration.

Brief ET Listing Comments

Eric: Suggested adding *Polytaenia nuttallii* as a POC monitored species, but not to the ET listing. It is at Grant Creek Prairie. Scott mentioned it is at a few sites in DuPage, in small populations. POC will add this plant to the monitored list.

Juanita: What about *Goodyera pubescens* as a potential listed species?

Eric: It's more common further south in the state.

Meeting adjourned at 12:30 p.m.



Plants of Concern



Plants of Concern

Plants of Concern Advisory Group Meeting

Thursday, December 12, 2013

9:30 a.m. to 1:00 p.m.

Chicago Botanic Garden, 1000 Lake Cook Road, Glencoe, IL

Plant Science Center, Seminar Rooms A and B

Attending: Susanne Masi, Rachel Goad, Daniel Suarez, Justin Aaron, Pati Vitt, Sarah Whidden, Gil Nore, Juanita Armstrong, Victoria Graham, Scott Kobal, Duane Ambroz, Elizabeth Ettelson, Stephanie Frischie, Jennifer Durkin, Renee Thakali, Karen Tharp, Robb Cleave, Andy Olnas, Ben Haberthur, Aimee Collins, Laurie Ryan, Michelle McInnis, Linda Masters, Margo Milde, Karen Glennemeier, Cindy Hedges, Kelly Neal, Ken Klick, Stephen Packard, Chip O'Leary, Carol Freeman

Introductions and Announcements. Welcome to the 14th Annual POC Meeting.

Susanne began the meeting by referring to her upcoming retirement after 22 years at the Garden and 14 years with POC, expressing her appreciation to Advisory Group members for their longstanding partnership with POC “with enthusiasm and professional dedication”. They helped the program grow, brought in their volunteers to participate and in many cases engaged in field monitoring. It has been a successful program precisely because of these partnerships and collaborations. She expressed satisfaction in passing on POC leadership to Rachel Goad’s capable hands under Pati Vitt’s supportive supervision.

2013 update, with reference to prior years (PPT presentation, previously provided to participants)

Susanne Masi, overview: accomplishments, volunteers

Karen G. Regarding threat reports, can these data be used as a random generalization for the entire region, since occurrence of rare species is geographically random?

Pati V. This could be done by using a random subsample of all the GPS coordinates in the database.

Renee T: In Susanne’s opinion, how has POC filled the gap it initially strived to fill?

Susanne: The program is currently monitoring 80% of the listed Illinois species (66% of EORs), and the model of the program has been successful in engaging numerous partners and volunteers at all levels; the framework for the program exists, with POC considered the chief means for monitoring rare plants with standardized protocols across the region. However there are gaps and more work needs to be done. The program does have a clear idea what areas need more attention and funding needs to present itself before they can be tackled.

Stephen P: There is a different attitude of “endangered species” now than a few decades ago. Before, local people were more invested in these conservation causes while now it is all controlled by bureaucrats. I feel the public needs to be more involved. (Many in attendance didn’t realize this was the case and general attitude).

Rachel Goad, research and analysis, forays for large populations

Cindy H: Can you provide guidance on grid-based large population monitoring on your website?

Rachel: Yes, we can work on that.

Stephen P: All the species you reported on are growing region-wide and none are declining. That is a success story!

Rachel: Yes, it is. We need to also look at populations that we consider to be inactive and evaluate those that are inactive because they have been extirpated.

Stephanie F: Does this trend analysis include estimated populations?

Rachel: Yes, population estimates are included.



Daniel Suarez, Cook County FPD program, with Sarah Whidden, NEIU
Justin Aaron, Midewin National Tallgrass Prairie program
Bianca Rosenbaum, Database and Website updates

Juanita: Congratulations on all your work with the website and database. Using the website has gone well this year, but I would like to be able to enter coordinates in State Plane coordinate system.

Rachel: We will look at adding that option.

Break

Carol Freeman Photography

Carol spoke of her continued goal to capture images of all Illinois listed species and of providing a face to the research that is being done on them. She distributed endangered species bookmarks and trading cards and offered her 2014 calendar for sale. Susanne thanked Carol for giving some of the profits for her 2013 calendar to POC.

Miscellaneous Items

*Illinois Endangered and Threatened Species listing process – preliminary approvals
related to POC species*

Susanne summarized the preliminary approvals by the IL Endangered Species Protection Board for POC monitored species to be removed from the list or changed in status. The process will be finalized after a public hearing/comment period and final review by the board – sometime in Spring 2014.

Remove from list: *Carex woodii*, *Cypripedium candidum*, *Liatris scariosa* var. *nieuwlandii*, *Oenothera perennis*, *Tomantbera auriculata* and *Viola conspersa*

Change from Endangered to Threatened: *Ammophila breviligulata*, *Carex cryptolepis*, *Filipendula rubra*, *Polygonatum pubescens*

Change from Threatened to Endangered: *Carex intumescens*, *Corallorhiza maculata*, *Elymus trachycaulus* and *Lechea intermedia*.

Add to Endangered: *Utricularia subulata*; *Andromeda glaucophylla* (latter still to be presented by Ken Klick)

NOTE: Not all of these species were included in the list presented at the Advisory Group meeting. Several of these species' status change resulted directly from POC reporting.

Scott K: What about *Juglans cinerea*?

Susanne: I fought hard to include *J. cinerea* on the list but was not successful. This species is seriously threatened by canker fungus. Illinois Endangered Species Protection Board wanted more data, and they thought the data given to them was too Northeastern Illinois-heavy.

Scott K.: All *J. cinerea* trees [in our county] are dead or dying.

Susanne: There is quite a bit of documentation showing that they are dead or dying, but INAI surveys report many of living trees.

POC: Vision for the Future – alive, well and forward looking

Pati Vitt

Pati iterated the Garden's strong continued support for the Plants of Concern program, which is demonstrated by maintaining the manager's position (Rachel Goad) in the operational budget as a hard salaried position.



Plants of Concern



Plants of Concern

Rachel Goad: What POC can do for you, what you can do for POC!

Rachel: I am thrilled to be serving as the POC manager starting in 2014, and humbled by the opportunity to do so. Susanne's vision in starting the program and tenacity in maintaining and growing it is inspiring. With your help, POC has built an impressive program that makes significant contributions to the conservation of rare flora in our region. The first decade of POC programmatic goals have focused on increasing our identified metrics of success, such as the number of species and populations monitored. The program has seen impressive growth but it's safe to say that we have reached capacity in terms of the amount of monitoring we are able to coordinate. The evolution of POC will require focusing on the fruits of this work, our impressive dataset. (*See previously sent presentation for additional information*)

Cindy H: I love the idea of an interaction website/database, both with regards to management and for volunteer interactivity.

Chip O: I think the alert system could be a very strong tool for land owners and managers.

Juanita A: Perhaps landowners can share GIS data with POC to expand on data, since many forest preserves already take that data. These management maps can be overlaid on population maps.

Renee T: Perhaps a holistic focus needs to be placed across all agencies to look for trends in management

Pati: (in response to everyone) Focusing on spatial data may illuminate experimental avenues, which could strengthen NSF grant proposals.

Stephen P.: Is there anything that we can do collaboratively to make NSF grant proposals better?

Pati: NSF wants proposals to have clearly defined research questions and inquiries. We need to make POC seem more experimental, which may make proposals successful.

Stephen P.: Perhaps there is a way to entice volunteers into GPSing for forest preserve districts? It would be fairly easy. They upload coordinates into Restoration Map and those coordinates can be uploaded into GIS for individual counties to analyze.

Ben H: For those forest preserves that don't currently have intensive spatial data, does funding exist to develop that?

Pati: Perhaps agencies can look into intern or research assistant roles to develop GIS information. (Added with regard to Stephen P's comment about public interest) Adding things like PVA analysis for specific species of interest may be a way to promote public interest. The website can be developed and promoted to increase interactivity, but would require promotion from all invested agencies.

Cindy H: Is the genetic data from the *Isoetes* graduate thesis available?

Rachel: It will be, and here is a brief summary: Populations showed high levels of genetic diversity and high levels of inbreeding. It seemed spore dispersal was very localized, with small depressions where a few plants were found being their extent. *Cirsium* tends to be very genetically diverse as well, however Illinois populations have very low flowering and seed set each year. One population POC monitors has not had a flowering individual since monitoring began.

Susanne: All participating landowners on this project will receive the thesis. (Done)

Stephen: Was there much controversy when *C. hillii* was delisted in 2004?

Susanne: Not significantly, however I strongly fought against its delisting.

Related Issues:

S. Packard's suggestions for discussion regarding enhanced conservation benefits from POC:

Monitoring of introduced populations? (not discussed)

Questions not included in [current] analyses that would yield important information to managers?

Ways to get POC insights out to site managers?

Would POC volunteers benefit from resources or training to be more effective conservation advocates? (not discussed as a specific topic)

Stephen P: How do other agencies use POC data? Could we share techniques for using the data in management planning?



Scott K and Cindy H: We use the data in making management decisions.

Juanita A: We use POC data to prioritize areas to work in.

Cindy H: Our land management team targets species that are declining or threatened and performs specific management on those.

Stephen P: Can POC share the ways that other partners are using this data?

Ben: We schedule POC management projects between other major projects.

Cindy: We also cage POC's being heavily deer-browsed.

Stephen P: Many agencies don't have detailed GPS layers of management and invasive data. Volunteers can do this with a phone application and Restoration Map.

Stephen P: Could POC provide regional, county-wide trends for species in each county? You could click on a county and see a list of POC species present in that county, with no specific location information. General trends for that county could be presented, and missing data could be highlighted to advertise the need for more volunteers.

Rachel: This could be a great way to provide the public with masked POC data and engage more volunteers.

Ben: Geocaching is a popular past time, so it may be feasible to get folks to collect management data for us, but processing all that data is time-consuming.

Carol F: That could be a good project for a High School group.

Juanita A: Do High School students use GIS?

Pati: Yes, and we have a group of High School folks coming in this summer for a 3 week course. Perhaps we could integrate a project on collecting management information. We're looking for datasets they can work with.

Adjournment:

Plants of Concern sites designated as Nature Preserves,
Land and Water Reserves, or that are owned by IDNR

Site name	Designation	Land owner
Manuk-Sook LWR	LWR	John Clemetsen
Mskoda	LWR	TNC
Orland Grassland	LWR	FPD Cook County
Superior Street LWR	LWR	Calumet Memorial Park District
Sweet Fern Savanna	LWR	Marianne Hahn
Tallmadge Sand Forest	LWR	TNC
West Side Community Park (Campton Hills LWR)	LWR	St. Charles Park District
Almon Underwood Forest Preserve	NP	FPD Kane County
Amberin Ash Ridge	NP	Staley Family
Bakers Lake	NP	Village of Barrington
Belmont Prairie	NP	Downer's Grove Park District
Bliss Woods Forest Preserve	NP	FPD Kane County
Bluff Spring Fen	NP	FPD Cook County and City of Elgin
Boloria Fen and Sedge Meadow	NP	Boone Creek Watershed Alliance
Boone Creek Fen	NP	O'Donnell Family
Braidwood Dunes and Savanna	NP	FPD Will County
Brookfield Woods Prairie/Salt Creek Prairie	NP	FPD Cook County
Burlington Prairie	NP	FPD Kane County
Bystricky Prairie	NP	CD McHenry County/Marty Papanek
Camp Sagawau	NP	FPD Cook County
Cap Sauers Holdings	NP	FPD Cook County
Carl Becker NP	NP	TNC
Cedar Lake Bog-Marsh	NP	FPD Lake County
Chicago Ridge Prairie	NP	Oak Lawn Park District
Churchill Woods	NP	FPD DuPage County
Cline Avenue Nature Preserve	NP	Save the Dunes Council
Conrad Station	NP	TNC
Cotton Creek Marsh	NP	CD McHenry County
Deer Grove	NP	FPD Cook County
Dellwood Park West NP/Lockport Prairie East	NP	Lockport Township Park District/FPD Will County
Des Plaines Riverway	NP	FPD DuPage County
Dewey Helmick Nature Preserve (Old Plank Road Trail)	NP	Rich Township
Dick Young Forest Preserve	NP	FPD Kane County
Dixie Briggs Fromm NP	NP	Dundee Township
Dropseed Prairie	NP	TNC
East Skokie NP	NP	Lake Forest Open Lands Association
Eleven-Acre Prairie Nature Preserve	NP	Save the Dunes Conservation Fund
Everett Farm NP	NP	Lake Forest Open Lands Association
Farm Trails North NP	NP	Village of North Barrington
Fel-pro	NP	CD McHenry County
Florsheim Park/North Park	NP	Village of Lincolnshire
Fourth Lake Fen	NP	FPD Lake County
Fox River Bike Trail and Trout Park	NP	FPD Kane County/City of Elgin
Freeman Kame	NP	FPD Kane County
Gensburg Markham Prairie	NP	TNC, Northeastern IL Univ

Plants of Concern sites designated as Nature Preserves,
Land and Water Reserves, or that are owned by IDNR

Site name	Designation	Land owner
Glacial Park	NP	CD McHenry County
Gladstone Fen	NP	Lorna Gladstone
Glenbrook North High School Prairie NP	NP	Glenbrook School District 225
Goodenow Grove NP	NP	FPD Will County
Grainger Flatwoods	NP	FPD Lake County
Grant Woods Forest Preserve (Gavin Bog and Prairie)	NP	FPD Lake County
Grassy Lake (Wagner Fen NP) CFC	NP	FPD Lake County and Citizens for Conservation
Grassy Lake (Wagner Fen NP) FPD	NP	FPD Lake County
Heron Creek Forest Preserve	NP	FPD Lake County
Hickory Creek Barrens	NP	FPD Will County
Highmoor Prairie	NP	Highland Park/Park District
Hopkins Park Nature Preserve	NP	TNC
Jurgensen Prairie	NP	FPD Cook County
Kennicotts Grove	NP	Glenview Park District
Lake Elizabeth	NP	CD McHenry County
Lakewood Forest Preserve	NP	FPD Lake County
Lakewood Forest Preserve (Wauconda Bog)	NP	FPD Lake County
LeRoy Oakes Forest Preserve	NP	FPD Kane County
LeRoy Oakes Forest Preserve (Murray Prairie)	NP	FPD Kane County
Liberty Prairie	NP	Libertyville Township
Lind Woods	NP	CD McHenry County
Lockport Prairie	NP	FPD Will County
Lyons Prairie and Marsh	NP	CD McHenry County
Lyons Woods	NP	FPD Lake County
MacArthur Woods	NP	FPD Lake County
Main Street Prairie NP	NP	Cary Park District
Maramech Forest Preserve	NP	FPD Kendall County
Markham East	NP	TNC
Markham South	NP	TNC
Meacham Grove NP	NP	FPD DuPage County
Meissner-Corron (Russell Fen)	NP	FPD Kane County
Messenger Woods	NP	FPD Will County
Middlefork Savanna	NP	FPD Lake County
Oakwood Hills Fen	NP	Village of Oakwood Hills
Paintbrush Prairie	NP	TNC
Palatine Prairie	NP	Palatine Park District + MWRD
Palos Fen	NP	FPD Cook County
Pembroke Savanna	NP	TNC
Pistakee Bog	NP	FPD Lake County
Powderhorn Prairie	NP	FPD Cook County
Prairie Hill School (Cary Junior High School Prairie NP)	NP	Cary School District
Pratts Wayne Woods NP	NP	FPD DuPage County
Reed-Turner Woodland and Woodland Ridge Lot 2	NP	The Long Grove Park District
Romeoville Prairie NP	NP	FPD Will County

Plants of Concern sites designated as Nature Preserves,
Land and Water Reserves, or that are owned by IDNR

Site name	Designation	Land owner
Ryerson Conservation Area	NP	FPD Lake County
Sand Ridge Prairie NP	NP	FPD Cook County
Sand Ridge Savanna	NP	FPD Will County
Sante Fe Prairie	NP	Civic Center Auth of I&M Canal Natl Herit Corridor
Shoe Factory Road Prairie	NP	FPD Cook County
Silver Creek (Bates Fen)	NP	CD McHenry County
Sleepy Hollow Ravine	NP	Glen Speigler
Somme Prairie NP	NP	FPD Cook County
Spring Bluff	NP	FPD Lake County
Spring Grove Fen	NP	CD McHenry County
St. Francis Woods Forest Preserve	NP	FPD Lake County
Sternes Woods Fen	NP	TNC
Sundrop Prairie	NP	TNC
Swift Prairie (Swift Road Meadow)	NP	FPD DuPage County
Thornton-Lansing Road NP (Zanders)	NP	FPD Cook County
Tower Lake Fen	NP	Village of North Barrington
Trout Park NP	NP	City of Elgin
Vermont Cemetery	NP	FPD Will County
Wadsworth Prairie	NP	FPD Lake County/RR Right of Way
West Chicago Prairie	NP	FPD DuPage County
Wolf Road Prairie	NP	Village of Westchester
Yonder Prairie	NP	The Land Conservancy of McHenry County
James Pate Philip State Park	LWR	IDNR
Moraine Hills State Park	-	IDNR
Moraine Hills State Park (Pike's Marsh)	-	IDNR
Silver Springs State Park	-	IDNR
Waukegan IBSP Buffer Area (B2)	-	IDNR/Commonwealth Edison
William Powers Conservation Area (Wolf Lake)	-	IDNR
Blodgett Road Dolomite Prairie (Des Plaines River Conservation Area)	NP	IDNR
Chain O Lakes State Park (Pike Marsh)	NP	IDNR
Chain O Lakes State Park (Turner Lake)	NP	IDNR
Grant Creek Prairie and Midewin National Tallgrass Prairie	NP	IDNR + U.S. Forest Service
Grant Creek Prairie	NP	IDNR
Hitt's Siding Prairie	NP	IDNR
Illinois Beach State Park (North Unit)	NP	IDNR
Illinois Beach State Park (North Unit) and Hosah Prairie	NP	IDNR + Zion Park District
Illinois Beach State Park (South Unit)	NP	IDNR
Lake in the Hills Fen	NP	IDNR/Village of Lake in the Hills
Thorn Creek Woods	NP	FPD Will County, IDNR, Villages of Park Forest and University Park
Volo Bog	NP	IDNR



Plants of Concern Data Request Form

Date: 1/1/2013

Name:

Address:

Phone:

Email:

Affiliation:

Purpose for Data Request/Final Product Anticipated (e.g. report, thesis, dissertation, publication in a journal). Attach proposal if more space is needed.

Data requested (please indicate the fields requested from the POC Level 1 Monitoring Form):

Confidentiality Agreement:

As a researcher using Plants of Concern data, I understand that all location information must be kept secure. I agree not to reveal the location of any listed species to others who are not involved in monitoring, ownership or management of the site(s) in my research. I and any person who assists with my research will need pre-approval from the POC staff, landowner, and the Nature Preserves Commission (in the case of a Nature Preserve) and will also sign this confidentiality agreement. Any final report/publication will not include location information, including site name where Element Occurrences occur. *[spatial data will be masked; published only as a JPEG]* (If a publishing journal requires site names, permission must be obtained from POC.) POC and partner landowners should be acknowledged as the source of the data. ***Data released is to be used for the project on this application only and must be destroyed after one year, unless an extension is requested.***

Signature: _____

Date: _____

POC/AG/2012



Media Contact:

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For Immediate Release

**Chicago Botanic Garden's Plants of Concern Program Receives
Illinois Wildlife Preservation Fund Grant**
\$14,000 grant to go toward studying Illinois' rare plants

GLENCOE, Ill. (September 15, 2012)—The Chicago Botanic Garden's Plants of Concern (POC) program was recently awarded a \$14,000 Wildlife Preservation Fund Grant from the Illinois Department of Natural Resources. This grant is designed to preserve, protect, perpetuate and enhance non-game wildlife and native plant resources of Illinois through preservation of a satisfactory environment and an ecological balance. POC is a regional rare plant monitoring program designed to assess long-term trends in the state's rarest plant species.

Co-founded in 2000 by Susanne Masi, manager of regional floristics at the Chicago Botanic Garden, POC monitors plants in eight counties of northeastern Illinois including Cook, Lake, DuPage, McHenry, Kane, Will, Kendall and Kankakee. It is a collaboration of trained volunteers, "citizen scientists," working together with land managers and scientists. The data collected provides land managers with information that helps them set management goals for species within a community context and evaluate management practices.

"POC was created to meet the needs expressed in Chicago Wilderness' Biodiversity Recovery Plan (1999) to monitor endangered and threatened species throughout the region. We also update the Illinois Natural Heritage Database records for endangered and threatened plants," said Ms. Masi. "Nothing of this scale and scope had been done before. We rely on our citizen scientists to leverage the scarce resources of public and private agencies."

The POC program is founded on four core tenets:

- Monitor endangered, threatened, and locally rare plant species using standardized protocols.
- Assess long-term trends in rare plant populations in response to management activities and/or threats to populations.
- Train volunteers as citizen scientists to monitor rare plant populations and become conservation advocates.
- Provide information on population trends and potential threats to the populations to public and private landowners, land managers, and agencies as feedback to help determine future management practices.

Since its inception in 2000, the program has grown exponentially. Through 2011, POC had trained 670 citizen scientists; partnered with 112 landowners; and monitored 234 endangered, threatened and rare species at 319 sites. The importance of POC's citizen scientists can not be stressed enough. It is because of the dedication and perseverance of the volunteers that the program continues to thrive. The program has been supported by IDNR through the Wildlife Preservation Fund and other programs since 2004.

The opening of the Daniel F. and Ada L. Rice Plant Conservation Science Center enhances the visibility of the program and help it continue to grow. The Plant Science Center showcases the program as part of the multifaceted approach to plant science undertaken by Garden scientists, which includes ecology, population biology, genetics, and soil science. Additionally, the Plant Science Center's expanded Herbarium will help POC with identifying monitored species and their associate species.

Admission to the Chicago Botanic Garden is free. Select event fees apply. Parking is \$20 per car; free for Garden members. For more information about the Garden's Plants of Concern program visit www.chicagobotanic.org/research/plant_conservation/rare_plant or www.plantsofconcern.org; or call Susanne Masi at (847) 835-8269.

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Editors, please note: The Chicago Botanic Garden's newsroom is online at www.chicagobotanic.org/pr. For digital images, contact Julie McCaffrey at (847) 835-8213 or at jmccaffrey@chicagobotanic.org.

The Chicago Botanic Garden, one of the green treasures of the Forest Preserve District of Cook County, is a 385-acre living plant museum featuring 26 distinct display gardens surrounded by lakes, as well as a prairie and woodlands. With events, programs and activities for all ages, the Garden is open every day of the year, except Dec. 25. Admission is free; select event fees apply. Parking is \$20 per car; free for Garden members. The Garden is located at 1000 Lake Cook Road in Glencoe, Ill. Visit www.chicagobotanic.org, or call (847) 835-5440 for seasonal hours, images of the Garden and commuter transportation information.

The Chicago Botanic Garden is managed by the Chicago Horticultural Society. It opened to the public in 1972 and is home to the Joseph Regenstein, Jr. School of the Chicago Botanic Garden, offering a broad array of adult classes in plant science, landscape design and gardening arts. Nearly 200 Garden scientists work on plant conservation, research and environmental initiatives that have local, regional and global impact. The Center for Teaching and Learning brings the wonder of nature and plants to children, teens and teachers with hundreds of summer camp, family and teacher training programs. The Garden's Horticultural Therapy and Community Gardening programs provide nationally recognized community outreach and service programs. The Garden is also breaking new ground in urban horticulture and jobs training through its Windy City Harvest program, which offers a certificate in Sustainable Horticulture and Urban Agriculture in cooperation with City Colleges of Chicago. The Chicago Botanic Garden is accredited by the American Association of Museums and is a member of the American Public Gardens Association (APGA). In 2006, the Chicago Botanic Garden received the Award for Garden Excellence, given yearly by the APGA and Horticulture magazine to a public garden that exemplifies the highest standards of horticultural practices and has shown a commitment to supporting and demonstrating best gardening practices.

Attachment 13

Image descriptions and photographer attributions for POC photos from the 2012-2013 growing season.

1. Volunteers Linda Kellough and Nancy Sanders assist with rare plant monitoring at Openlands Lakeshore Preserve. Photo: R. Goad.
2. Volunteers and staff complete Level 2 monitoring for *Tomanthera auriculata*. Photo: R. Goad
3. *Spiranthes lacera var. gracilis* was found in multiple locations during the 2012 growing season. Photo: R. Goad
4. Volunteer Fay Liu assists with monitoring during a foray at Illinois Beach State Park. Photo: R. Goad
5. Staff and volunteers monitoring *Carex woodii* during a foray. Photo: R. Goad

*See digital image files included separately. Images are named using the numbers above (e.g, POC 1.jpg is relevant to the first image description).









