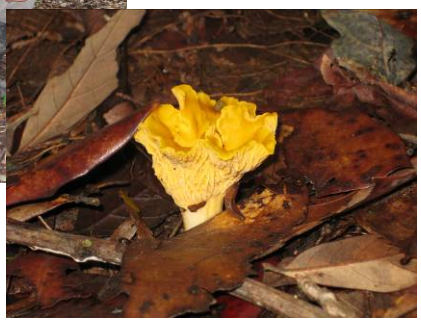
CHICAGO BOTANIC GARDEN



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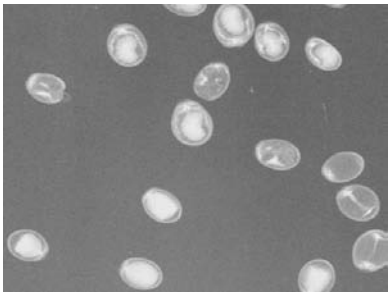
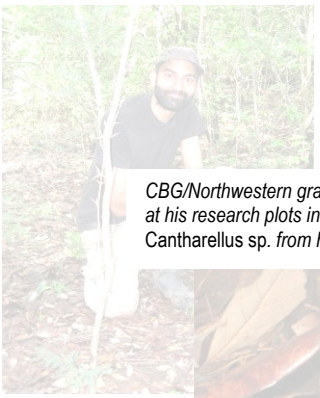


CHICAGO BOTANIC GARDEN

Susanne Masi (left) leads volunteers Peggy Hanlon (center) and Ellen Powell (right) in monitoring of rare species at Illinois Beach State Park.



CBG/Northwestern graduate student, Nik Desai, collecting at his research plots in Guanacaste, Costa Rica; below is Cantharellus sp. *from his plots.*

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*The new X-ray imaging equipment in the Dixon National Tallgrass Prairie Seed Bank gives a better indication of seeds' potential viability; this image of New Jersey Tea (*Ceanothus americanus*) reveals insect larvae within several seeds in the upper center of the image.*

Glen Madeja, a NU/CBG graduate (MS, 2010), monitors Miscanthus cultivars for fecundity and potential invasiveness.

Cirsium pitcheri *flower heads with weevil (*Larinus planus*) and weevil damage; this threatened native plant is further imperiled by the weevil introduced to control invasive thistles.*

Staff remove litter from wading bird habitat that continues to expand in shallow water within the Garden's portion of the Skokie River.

As the North Lake's water was drained jn preparation for a shoreline restoration project, nearly 2,500 native mussels were translocated to other Garden lakes.

Khuren Dukh field site in central Mongolia steppe; paleobotanical work uncovers fossil flowers and other plant remains in ongoing study of early angiosperm evolution.

CHICAGO BOTANIC GARDEN

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SCIENTIFIC STAFF
CHICAGO BOTANIC GARDEN

Greg Mueller, PhD ..... Vice President, Scientific and Academic Programs
Kayri Havens-Young, PhD.....Co-Director, Division of Plant Science and Conservation
Patrick S. Herendeen, PhD.....Co-Director, Division of Plant Science and Conservation
James R. Ault, PhD.....Director, Ornamental Plant Research
Robert J. Kirschner, BS..... Director, Restoration Ecology & Curator, Aquatics

Louise M. Egerton-Warburton, PhD.....Conservation Scientist, Soil Ecology
Jeremie B. Fant, PhD.....Conservation Scientist, Molecular Ecology and Lab Manager
Megan Haidet, MS .....Seeds of Success National Coordinator
Richard G. Hawke, BS .....Manager, Plant Evaluation
Greg Hitzroth, BS..... Research Assistant, Plants of Concern
Marian Hofherr, BS ..... CLM Internship Program Coordinator
Sarah Jacobi, PhD .....Adjunct Conservation Scientist, Modeling
Gail Kushino, BFA..... Administrative Assistant
Dan Larkin, PhD..... Conservation Scientist, Community Ecology & Curator, Native Habitats
Eric Lonsdorf, PhD.....Adjunct Conservation Scientist, Modeling
Susanne Masi, MA.....Manager, Plants of Concern
Chrissy McNulty, BS.....Aquatic Plant Specialist
Joan M. O'Shaughnessy, MA, JD ..... Ecologist (River and Prairie)
Bianca Rosendorn, MS.....Database Technician
Krissa Skogen, PhD.....Conservation Scientist and CLM Internship Program Manager
David Sollenberger, BS .....Seed Conservation Specialist
James F. Steffen, MS.....Ecologist (Woodlands)
Shannon Still, PhD.....Post-doctoral Research Associate
Rebecca Tonietto, BS .....Research Assistant/Graduate Student
Pati Vitt, PhD ..... Conservation Scientist, Demography and Stone Curator, Seed Bank
Stuart Wagenius, PhD ..... Conservation Scientist, Quantitative Genetics
Norm Wickett, PhD .....Conservation Scientist, Genomics
Andrew Wilson, PhD .....Postdoctoral Research Associate
Colby Witherup, BS ..... Research Assistant
Emily Yates, MS, GISP.....Seed Bank Coordinator/GIS Lab Manager
Nyree Zerega, PhD..... Plant Systematist, Herbarium Curator, Dir. of the Graduate Program

Faculty Appointments
J. Ault (Northwestern University)
L. Egerton Warburton (Northwestern University)
J. Fant (Northwestern University)
K. Havens (Loyola University, Northwestern University, University of Illinois-Chicago)
P. Herendeen (University of Chicago, Northwestern University, Field Museum of Natural History)
D. Larkin (Northwestern University, Illinois Institute of Technology)
G. Mueller (Northwestern University, University of Chicago, University of Illinois,-Chicago, Field Museum of Natural History)
K. Skogen (Northwestern University)
P. Vitt (Northwestern University)

S. Wagenius (Northwestern University)
N. Wickett (Northwestern University, Field Museum of Natural History)
N. Zerega (Northwestern University, Field Museum of Natural History)

RESEARCH ASSOCIATES

Mary Ashley, PhD, University of Illinois-Chicago
Tim Bell, PhD, Chicago State University
Diane Byers, PhD, Illinois State University
Pamela Geddes, PhD, Northeastern Illinois University
Ed Guerrant, PhD, Berry Botanic Garden
Brooke Parry Hecht, PhD, Center for Humans and Nature
Liam Heneghan, PhD, DePaul University
Andrew Jacobson, PhD, Northwestern University
Claudia Jolls, PhD, East Carolina University
Bruce Kendall, PhD, University of California, Santa Barbara
Tiffany Knight, PhD, Washington University
Mike Maunder, PhD, Al Ain Wildlife Park
Eric Menges, PhD, Archbold Biological Station
Bryan Pickett, PhD, Loyola University
Diane Ragone, PhD, National Tropical Botanical Garden
Francesca McInerney, PhD, Northwestern University

INTERNS

Division of Plant Science and Conservation

Deena Blanchard
Jeb Boyer
Becky Cotteleer
Kassandra Davis
Octavio Oliveira De Araujo
Greg Diersen
Sonia Doshi
Evan Eifler
Emilee Gaulkee
Ekjyot Gill
Michelle Glantz
Nicholas Goldsmith
Susan Helford
Alex Hertel
Oscar Herrera
Evan Hilpman
Shayla Hobbs
Victoria Jones
Rebecca Lehrman
William Levinson
Thea Klein-Mayer
Laura Kochlefl
Jill Meyer
Lisa Mithun

Allegra Mount
Sarah Moy
Katherine Muller
Lee Rodman
Tatiana Skyba
Callin Switzer
Melissa Tienes
Sadie Todd
Maria Wang
Hannah Weinberg-Wolf
Tyr Wiesner-Hanks
Christine Whitacre
Amber Zahler

Conservation and Land Management Program Interns

Lauren Anderson	San Diego Zoo, CA
Rose Ashbach	Hollister, CA
Lawrence Ashton	Kemmerer, WY
Scott Batiuk	Carson City, NV
Paul Beaty	Angeles National Forest
Jamie Berlin	Farmington, NM
Conor Bidelspach	USFS Bend Seed Extractory
Gina Bono	Las Cruces, NM
Emily Borodkin	Farmington, NM
Joseph Boyer	Vernal, UT
Samantha Bray	Cody, WY
Rebecca Brinker	Safford, AZ
Sasha Broadstone	Carson City, NV
Andrew Buijs	Newcastle, WY
Laura Busby	Medford, OR
Matthew Candeias	Pinedale, WY
Emily Capelin	Alaska State Office
Amanda Carlson	Grand Junction, CO
Jared Carse	Needles, CA
Susan Chamberlain	Rawlins, WY
Nga Chan	Carson City, NV
Alexandra Clifford	Yuma, AZ
Kelsey Clouse	University of Arizona Herbarium
Camille Cope (Duncan)	Portland, OR
Sneha Dante	Boise, ID
Brittney Daugherty	Safford, AZ
Peter Deichmann	Rawlins, WY
Marie Dematatis	Rock Springs, WY
Melissa DeSiervo	Lockeford, CA
Michelle Downey	Cedar City, UT
Lara Drizd	Portland, OR
Cory Elowe	Cedar City, UT
Alyssa Epstein	Alaska State Office

Thomas Ersfeld	RMRS GSD Shrub Sciences Lab
Candace Fallon	Portland, OR
Amanda Ferguson	Carson City, NV
Jeffrey Flory	Lakewood, CO
Christi Gabriel	Rancho Santa Ana Botanic Garden, CA
Magda Garbowski	Vale, OR
Paula Garcia	Roswell, NM
Sarah Garvin	USFS Bend Seed Extractory
Cheryl Geiger	Buffalo, WY
Giuliana Gobbato	Zion National Park
Ryan Godfrey	Vale, OR
Emily Griffoul	Las Vegas, NV
Kira Hefty	Kemmerer, WY
Angelique Herman	San Diego Zoo, CA
Christopher Hoffman	Carson City, NV
Amy Holmen	Alturas, CA
Jody Hull	Boise, ID
Emily Hutchins	Lewistown, MT
Andrea Irons	Carson City, NV
Jared Jaggers	Carson City, NV
Vincent James	Palm Springs, CA
Scott Johnson	Folsom, CA
Brian Josey	Carson City, NV
Brian Josey	Pinedale, WY
Katie Kain	Palm Springs, CA
Bonnie Kalb	Carson City, NV
Barry Kaminsky	Boise, ID
Miguel Kaminsky	San Diego Zoo, CA
Elizabeth Kane	Surprise, CA
Allison Keith	Vernal, UT
Heikki Kiheri	Las Vegas, NV
Katie Klein	Cheyenne, WY
Lara Kobelt	Rock Springs, WY
Amber Kowal	Carson City, NV
John Krapek	Carson City, NV
Thomas Laird	Arcata, CA
Ryan Lane	Fairbanks, AK
Patrick Larson	Carlsbad, NM
Kristin Longman	Las Cruces, NM
Andrew Maguire	Fort Collins, CO
Amy Markstein	Tucson, AZ
Merry Marshall	Rocky Mountain Research Station, ID
Scott Massed	Carson City, NV
Derrick Mathews	RMRS GSD Shrub Sciences Lab
Derrick Mathews	Carson City, NV
Jacqueline McConnaughy	Rancho Santa Ana Botanic Garden, CA
Shea Meyer	Phoenix, AZ
Karley Miller	Redding, CA

Andrew Monks	Rancho Santa Ana Botanic Garden, CA
Daniel Morgan	Ironwood Forest NM
Cody Mosley	Phoenix, AZ
Diane Narem	Lakeview, OR
Diane Narem	Angeles National Forest
Elizabeth Ng	Klamath Falls
Alexandra Onisko	Carson City, NV
Therese Parys	Miles City, MT
Chenie Prudhomme	Fort Collins, CO
Natalie Pyrooz	Kemmerer, WY
Courtney Quade	Cedar City, UT
Stephanie Rockwood	Rancho Santa Ana Botanic Garden, CA
Elizabeth Rowen	Bishop, CA
Anna Salinas	Rawlins, WY
Cayce Salvino	Alturas, CA
Corey Sample	RMRS GSD Shrub Sciences Lab
Aileen Shaw	Carson City, NV
Catherine Shirley	Lockeford, CA
Samuel Skibicki	Las Vegas, NV
Brooke Stallings	Miles City, MT
Justin Stephens	Carson City, NV
Jason Stettler	RMRS GSD Shrub Sciences Lab
Emma Stewart	Cheyenne, WY
Stefanie Strebel	Carson City, NV
Jeannine Strenk	Cheyenne, WY
Tyler Stuart	Lander, WY
Nora Talkington	Las Vegas, NV
Aaron Thom	Hollister, CA
Brittany Thompson	Fort Collins, CO
Brittany Thompson	Klamath Falls
Lea Tuttle	Missoula, MT
Nicolas Umstattd	Safford, AZ
Lisa VanTieghem	Lakeview, OR
Sarah Ward	Rancho Santa Ana Botanic Garden, CA
Sarah Ward	Farmington, NM
Sophia Weinmann	Folsom, CA
Anthony Wenke	Farmington, NM
Laney Widener	Needles, CA
Emma Williams	San Bernardino National Forest
Samantha Winder	Lakewood, CO
Katherine Wright	Buffalo, WY
Julie Wynia	Folsom, CA

GRADUATE STUDENTS ADVISED

Jennifer Alyah	MS, Northwestern University (Larkin, Havens)
Rebecca Barak	MS, Northwestern University (Skogen)
Emily Booth	MS, Northwestern University (Skogen, graduated 2011)
Anna Braum	MS, Northwestern University (Fant)

Laura Briscoe	MS, Northwestern University (Wickett)
Lindsay Darling	MS, Northwestern University (Zerega)
Nikhilesh Desai	MS, Northwestern University (Mueller, Egerton-Warburton)
Ryan Disney	MS, Northwestern University (Larkin)
Joshua Drizin	MS, Northwestern University (Wagenius)
Christine Dumoulin	MS, Northwestern University (Wagenius, graduated 2011)
Daniel Fink	MS, Northeastern Illinois University (Masi)
Kate Gallagher	MS, Northwestern University (Wagenius, graduated 2011)
Wes Glisson	MS, Northwestern University (Larkin)
Melissa Gray	MS, Northwestern University (Skogen, graduated 2011)
Paul Guluzian	PhD, University of Illinois Chicago (Havens, graduated 2011)
Paul Hartzog	PhD, Northwestern University (Larkin)
Robert Hevey	MS, Northwestern University (Egerton-Warburton)
Een Sun Kim	PhD, University of Illinois Chicago (Ashley, Fant)
Kelly Ksiazek	MS, Northwestern University (Fant, graduated 2011), PhD, Northwestern University (Skogen)
Colleen Michael	MS, Northwestern University (Herendeen)
Benjamin Morgan	PhD, Northwestern Univeristy (Egerton-Warburton)
Katherine Muller	MS, Northwestern University (Wagenius)
Corey Palmer	M.S., Northwestern University (Mueller, Egerton-Warburton)
Amy Price	MS, Northwestern University (Larkin, graduated 2011)
Aleksandar Radosavljevic	PhD, Northwestern University (Herendeen)
Matthew Rhodes	MS, Northwestern University (Skogen)
Ricardo Rivera	MS, Northwestern University (Skogen)
Jennifer Schwarz	MS, Northwestern University (Havens)
Karen Taira	MS, Northwestern University (Wagenius)
Melissa Tienes	MS, Northwestern University (Vitt, graduated 2011)
Rebecca Tonietto	PhD, Northwestern University (Larkin)
Byron Tsang	MS, Northwestern University (Larkin)
Lauren Umek	PhD, Northwestern University (Egerton-Warburton)
Erin Vander Stelt	MS, Northwestern University (Larkin)
Colby Witherup	MS, Northwestern University (Zerega)
Rui Zhang	PhD, Northwestern University (Mueller)

RESEARCH PROJECTS & CONSERVATION PROGRAMS

Understanding Threats to Plants, Fungi and Native Habitats

Phenology Projects: In partnership with the National Ecological Observatory Network (NEON) and education staff, we continued work on the Project BudBurst and Floral Report Card projects. Project BudBurst is a national citizen science campaign designed to engage the public in the collection of important ecological data about the timing of leafing, flowering, and fruiting of plants (plant phenophases) which are related to climate. We have observers in all 50 states. The Floral Report Card project consists of a network of identical climate change monitoring gardens. In 2011, gardens were installed in 12 locations (four in Chicago, four in Seattle, Boston, Washington DC, North Carolina, and Iowa). Data collection will begin in 2012 (Havens-Young, Schwarz-Ballard, and NEON collaborators).

Cultivars of Invasive Species: It is well known that cultivars of invasive species can vary widely in fecundity (viable seed production), leaving many wondering if all cultivars should be banned from sale when the parent species of those cultivar is deemed invasive. In 2011 we published results of a modeling study to determine if reductions in fecundity of an invasive species can result in a plant that is no longer invasive (Knight, Havens and Vitt, 2011). We found that fecundity needs to be reduced to zero or nearly so for long-lived species in order for that species or cultivar to be considered "safe" or non-invasive. Fecundity reductions of 60-70% often made an invasive annual or biennial "safe." We also completed work on a four-year study of *Miscanthus sinensis* cultivars. In particular, we assessed fecundity and seed viability to determine if the cultivars are likely to be as invasive as the wild type. In our evaluation, only three cultivars were determined to be safe: *Miscanthus* x *giganteus*, *M. sinensis* 'Silberpfeil', and *M. sinensis* var. *condensatus* 'Cabaret'. Since 'Cabaret' was not reliably hardy, we only recommend the former two cultivars for use in this region (Havens-Young, Vitt, Madeja, Hawke, Umek, and outside collaborators).

Genetic Diversity in Rare Species: The maintenance of biodiversity is an important objective of many conservation plans. We are working with a number of institutions to assess the levels of genetic diversity that currently exists in a number of rare species. This includes working with Mike Howard (New Mexico BLM) on the critically imperiled *Lepidospartum brugessi* which is only found a few locations in southern New Mexico and northern Texas, Dr Tiffany Knight (Washington University) on the federally endangered *Cirsium fonitinale,* and Dr. Ori Fragman-Sapir (Jerulsalem Botanic Garden) on the globally rare *Iris vartanii.* These types of studies allow us to assess populations of critical concern and assist with management decisions (Fant and collaborators).

Gravel Hill Biodiversity: Much like wetlands, gravel hills prairies represent a sub-microcosm within the tallgrass prairie. The drier conditions, due to soil make-up and topography, support a unique plant community, including a number of important endemic and rare species. With the fragmentation of the landscape, these habitats are becoming increasingly isolated, many populations of these rare species are declining, and we are seeing reproductive failure in a number of species. In a comprehensive study of community structure, demography, and genetics we are investigating the decline of species within these communities in the Chicago region and the Wisconsin Driftless Area, focusing on *Cirsium hillii*, *Asclepias lanuginosa, A. viridiflora,* and *Castilleja sessiliflora.* This work will allow us to identify critical threats to populations (invasive species, management, pollinator loss), identify areas suitable for restoring these critical species, and improving reproductive fertility in current populations (Fant, Masi, Skogen, Larkin, and other collaborators).

Roof Top Ecosystems: City green spaces are being recognized as important components of the urban ecosystem providing usable habitat for many organisms, including migrating species. Green roofs are just one example of an urban green space, but they are both novel and rapidly increasing in area within North America. Graduate students Rebecca Tonietto and Kelly Ksiazek have been documenting the ecological services that green roofs provide as well as describing the ecological services found on the green roofs. Their work has resulted in three publications to date and Kelly is going to continue to work on green roofs for her PhD dissertation (Advisors: Fant, Larkin, and Skogen).

Restoration Ecology of Native Bee Communities: We completed our second year of field work investigating controls on biodiversity patterns of native bees in Chicago-area remnant, degraded, and restored prairies. If bee biodiversity is driven by *niche-based processes* (e.g., species interactions, environmental filtering), then land managers may be able to target restoration efforts for bee-community composition and diversity. In contrast, if *neutral factors* drive community assembly, then the effects of site-level management would be weak relative to broader landscape factors such as site size and proximity. We are conducting bee and vegetation sampling in 18 sites, analyzing surround land cover, and integrating phylogenetic and community-level data to address these issues (Tonietto and Larkin).

Wetland Plant Communities and Secretive Marshbirds: We completed field work in southern Wisconsin on a study testing how vegetation and habitat characteristics of wetlands influence their suitability for secretive marshbirds (rails, bitterns, grebes, coots, and moorhens). As wetlands are degraded by watershed disturbances and invasive-plant species, does their ability to support this under-studied group of birds of high conservation concern decline? And to what extent do wetlands in the region restored under the USDA's Wetland Reserve Program provide the conditions that secretive marshbirds require? Our vegetation, habitat, and landscape data from 30 natural and restored wetlands, along with three years of marshbird-monitoring data collected by our collaborators, will allow us to answer these questions (Larkin, Glisson, and outside collaborators).

Ecology and Genetics of *Phragmites australis* Invasion: There are both native and exotic subspecies of *Phragmites* in the upper Midwest. Problems associated with *Phragmites* invasion are compounded by uncertainty about how the subspecies differ in their ecology. Using genetic, plant-community, and environmental data collected at over 17 sites, we found that the exotic subspecies was generally "the bad apple." Exotic *Phragmites* showed stronger, more-positive responses to increased resource availability, and greater tolerance of disturbance. It had a more aggressive phenotype and was associated with shifts to species-poor plant communities with high abundances of other exotic species. Sexual reproduction via seed dispersal was an important means of spread, counter to the assumption of predominantly clonal spread in *Phragmites*. We found no evidence of hybridization between the native and exotic subspecies. Coastal and inland populations of the exotic subspecies were genetically distinct from each other, suggesting there may be distinct pathways of invasion in these areas or habitat differences leading to environmental selection (Larkin, Fant, and Price).

Controls on Wetland Denitrification: Denitrification is a valuable ecosystem service performed by wetlands that removes excess nitrate from waterways—a pollutant that causes eutrophication, algal blooms, and hypoxia. It is hypothesized that traits of wetland vegetation influence rates of denitrification. However, denitrification is difficult to study, and methodological limitations have produced a literature filled with null, conflicting, and unclear results. We are testing the hypothesis of vegetation effects on denitrification using promising biogeochemical approaches that are under-utilized in wetland ecosystems. We are comparing wetland systems dominated by a native ecosystem engineer, *Carex stricta* (tussock sedge), which imparts fine-scale topographic heterogeneity, with those dominated by the invasive grass *Phalaris arundinacea* (reed canarygrass), which leads to topographically and biotically homogenous sites. Thus far we have selected field sites, are refining methods in the lab for

stable-isotope analyses, and have received permission to use 54 wetland mesocosms planted with *C. stricta* for 5+ years (Hartzog, Larkin, and outside collaborators).

Restoration Requirements of Woodland Legumes: We are investigating how environmental changes associated with buckthorn invasion and removal, such as light and soil-nutrient availability, influence success of two legume species, *Desmodium glutinosum* and *Lespedeza violacea*, that appear to be declining in Chicago-area woodlands. We have completed field work in the Garden's McDonald Woods and are now conducting lab experiments to test how nutrient availability, competition with grasses, and different *Rhizobium* inoculants affect the performance of these species (Tsang, Larkin, and Steffen).

Long Distance Gene Flow and Hawkmoth Pollination: Long-distance pollination has widespread implications ranging from limiting population divergence, accelerating the spread of adaptive traits, disrupting gene complexes, and maintaining species cohesion. This is particularly the case for floral traits where long distance pollinators act as agents of selection while also constraining divergence. Since 2008, we've focused on *Oenothera harringtonii*, an endemic to southeastern Colorado. In 2011, we initiated similar studies in *Castilleja sessiliflora* in Colorado and Illinois. We use a combination of field, greenhouse, and molecular tools to assess long-distance pollination events via hawkmoths, the primary pollinator of both species. Analyses to date show little genetic differentiation range wide in *O. harringtonii,* implying high rates of gene flow among populations. However, data on floral scent shows a geographic pattern whereby populations in the south and east exhibit different scent compounds than those in the north and east. In addition, these results indicate that habitat fragmentation has not had a detectible affect on *O. harringtonii*, likely due to the fact that hawkmoth visitation still occurs in these populations. We plan to pursue similar questions with *C. sessiliflora* and additional species to determine the extent to which these patterns are generalizable for species primarily pollinated by long-distance pollinators such as hawkmoths.

Plants of Concern: In 2011, the Plants of Concern (POC) program completed its eleventh year. Since its inception, POC has trained and engaged 629 citizen scientists who have contributed 16,000 hours in the field and office. The program has monitored 265 endangered, threatened and rare species at 313 sites in 1,000 Element Occurrences throughout the Chicago Wilderness region that includes Illinois, Wiscosnin, and Indiana. As a strongly collaborative regional effort, POC has worked with 111 cooperating public and private landowners. In 2011, as a result of grant funds, the program placed special focus on monitoring at Midewin National Tallgrass Prairie for the ninth year as well as at Openlands Lakeshore Preserve. Grants announced during 2011 will expand POC's work to other lakeshore and ravine sites. Analyses of POC's 11-year dataset are yielding critical information on rare species' population trends in relation to management activities on a region-wide basis (Masi, Vitt, Steffen, Rosendorn, Yates, and interns).

Species Distribution Modeling: In 2011, we started research in modeling the species distribution of rare plants in the western United States. The project, funded by BLM, is examining the current and potential distribution of 400 rare plants, including many cacti species. The project was started by designing the research methodology, setting-up the research process, gathering data for use in the models, and acquiring the rare plant occurrence data from NatureServe. Models for several species are currently being processed

in order to search for these rare plants and validate our models during 2012 (Still, Vitt, and Havens-Young).

Rock Dissolution by Symbiotic Fungi: Mycorrhizal fungi, i.e., symbiotic fungi associated with the roots of trees, are known to actively enhance the dissolution of rocks. However, it is unclear if this trait has any ecological significance. We are testing the ability of various mycorrhizal fungi to release an essential plant nutrient, phosphorus, from basalt, and the amount released. We are also examining the tactic(s) that mycorrhizas use to release phosphorus. We found that mycorrhizas have a number of mechanisms for breaking down minerals including brute force, i.e., physical pressure exerted by the fungi as it grows into rock fissures, and acid etching of mineral surfaces by the fungus (Egerton-Warburton, Gill, and Jacobson).

Redistribution of Deep Soil Water by Tree Roots and Soil Fungi in Dry Seasonal Tropical Forests: Studies of plant water uptake have largely focused on the role of roots. However, mycorrhizal fungi can play key roles in moving water to plants and enhancing nutrient uptake under dry conditions. Our study is in the Yucatan Peninsula, where extreme seasonality limits growth in the dry season (January to June), and soil water levels drop 9 m below the surface so as to create an extremely dry surface soil. Most trees loose their leaves, but the evergreen trees appear to utilize deep water in subterranean caves. Our objective is to determine which tree species can actively acquire water from such depths and how much water is re-distributed within the dry upper soils by fungi (Egerton-Warburton and Beddows).

***Arisaema triphyllum* (Jack-in-the-Pulpit):** This gender-switching species, though common, serves as a model species to understand the effects of reproductive choices on population dynamics. Reproductive individuals in this species may be either male or female, depending upon size, with the largest plants expressing as female. Environmental conditions are known to affect the expression of gender and we completed a two-year study in 2011 looking at the effects of pollen load on the sex ratio of two populations in Lake County, Illinois. This study also examined the effects of habitat management on gender choices and population sex ratio. Management for an open canopy, particularly by removing invasive buckthorn, appears to increase the number of females in population (Vitt and Tienes).

***Cirsium pitcheri* (Pitcher's thistle):** In 2011, we completed work on a five-year grant to study the demography and genetics of *Cirsium pitcheri*, a threatened species that occurs around Lake Michigan. We found that the species is in decline. All monitored populations are below replacement rate due to numerous threats including invasive species, predation by goldfinches, and predation by a biocontrol weevil introduced to control weedy thistles. In 2011, we began demographic monitoring of a weevil-infested population in Wisconsin to track weevil effects (Havens-Young, Fant, Vitt, and outside collaborators).

***Echinacea angustifolia* (Purple coneflower):** Since 1995, we have investigated consequences of habitat fragmentation in tallgrass prairie, focusing on *Echinacea angustifolia* and its associated herbivores, pollinators, and competitors. During summer 2011, 12 scientists, students, and teachers lived and conducted experiments in rural western Minnesota. This year we planted 2,500 seedlings in an experiment designed to quantify fitness differences between plants grown from seed originating in a burn unit compared to a

unburned unit. We also continued measuring over 10,000 *Echinacea angustifolia* plants in long-term experimental plots. We harvested 3,000 flower heads which are being analyzed by a dozen volunteers who will count ~700,000 fruits and weigh or x-ray almost 100,000 of them. Results of this work will elucidate the interplay of evolutionary and ecological processes in fragmented populations. NSF will fund the project for another five years, 2011- 2016 (Wagenius and Ruth Shaw at University of Minnesota).

***Lespedeza leptostachya* (Prairie Bush Clover):** We have been monitoring populations of this federally threatened gravel-hill prairie species at Nachusa Grasslands in Franklin Grove, Jllinois and Harlem Hills Nature Preserve, part of Rock Cut State Park in Rockford, Jllinois, to determine best management practices since 2000. In 2011, we completed four years of an experimental demography study to elucidate the role of grass competition on vital rates, and have determined that reducing competition increases seedling recruitment, as does limited cattle grazing. In response, the stewards at Nachusa Grasslands are in the process of writing a management plant that will include bison. We will conduct an exclusion study at the time of bison introduction to determine the efficacy of this approach (Vitt, Havens-Young, and outside collaborators).

***Viola conspersa* (Dog violet):** Using ten years of volunteer-collected data, we have created a regional model of the state-threatened *Viola conspersa* to determine the effects of habitat management on population viability, particularly removal of invasive buckthorn canopy. Invasion by buckthorn forms a densely closed canopy that reduces reproduction via open-pollinated flowers in favor of production of closed-pollinated flowers. The shade created by a buckthorn canopy also affects survivorship and patterns of seed set, potentially causing local extinction. Using ten years of "before and after" data from six populations of *Viola conspersa* that had undergone buckthorn canopy removal at various points throughout the decade, we created integral projection models to understand the effects of management. Because management affects the ratio of open- to closed-floral ratio, we were able to explicitly model the effects of management on patterns of genetic diversity as well as population growth rate in light of the frequency of habitat restoration activities. Results showed that more open-pollinated flowers were produced when buckthorn canopy was removed periodically (every few years), suggesting that restoration activities such as removal of invasive species is favorable both to population size and to maximizing genetic diversity. Such results show that management may result in populations with greater genetic diversity and therefore more resilience to more effectively respond to environmental changes, such as a warming climate (Vitt).

Mitigating Threats

Seed Banking: The Garden's Dixon National Tallgrass Prairie Seed Bank continues to collect and preserve germplasm of native plant species from the upper Midwest. In 2011, we added 218 accessions of 184 species to the bank. Our total holdings include 2,021 accessions of 1,128 species. In 2011, we began systematic testing of seed viability of all our holdings using a new seed x-ray machine funded by NSF. We also collected seeds on contract for BLM-Wyoming and the US Forest Service. We continue to be an active partner in the national "Seeds of Success" program. Megan Haidet, hosted by the Bureau of Land Management, coordinates all Seeds of Success activities (Havens-Young, Haidet, Vitt, Yates, and Sollenberger).

Native Seed Farming: With an IMLS grant, the Garden is piloting a native seed increase project utilizing vacant city lots as urban native seed farms. In 2011, stakeholder surveys and a market analysis were completed. Species were selected for propagation in collaboration with Taylor Creek Nursery which will sell the seeds we produce. Propagation is underway and a spring 2013 outplanting is anticipated (Havens-Young, Vitt, Sollenberger, and Kirschner with Windy City Harvest staff).

Conservation and Restoration in Changing Environments (CARICE – Colorado Plateau): Over the last two years, this project has assessed plant and pollinator communities in degraded and undegraded sites in the Colorado Plateau, specifically on Bureau of Land Management and National Park Service lands in and around Zion National Park (Springdale, Utah, Washington Colorado) and Black Canyon of the Gunnison (Montrose, Colorado). Together with students, we performed pollinator observations, insect and vegetation surveys, and collected seed and soil data at eight sites at each respective location. Four of the eight sites were determined to be in need of restoration (dominated by invasive species such as cheatgrass), and the four remaining sites were not in immediate need of restoration. To date, all field data have been entered; specimens processed; and herbarium and insect vouchers have been identified, mounted, and entered into the Susan Dixon Herbarium at the Chicago Botanic Garden. The insect specimens were counted and identified to family. A second component of this project has mapped the distribution of cheatgrass (*Bromus tectorum)* and focal forb species throughout the Colorado Plateau. To map historic and present occurrences of targeted taxa, 1996 was used as the first year in present time (due to the marked spike in fire activity; wildfires affected 6,065,998 of land in 1996, the most since 1952 [FWS 1996]). Using collection records available from the Global Biodiversity Information Facility (GBIF) and Southwestern Environmental Information Network (SEINet), a database of 89 species and approximately 39,453 unique occurrence records was compiled. This database allows us to map current and historic collection localities and will provide a baseline from which to begin making projections of changes to species ranges under various scenarios of future climate change. Two of three Masters students, Emily Booth and Melissa Gray, who worked on complimentary components of this project, successfully defended their Masters theses in the summer 2011. Rebecca Barak's Masters research is ongoing (anticipated defense in 2012); the foci of her research are seed biology, invasive species, and competition in early life-history stages between native forb species and *Bromus tectorum*. Currently, we are in the process of compiling this information into a single database, preparing data for analysis and publication in peer-reviewed scientific journals. In addition, we are developing the next phase of this project, *Learning from native 'winners'* which will identify native species and populations that can perform well in degraded sites and potentially facilitate succession to diverse native communities, thus advancing public-land restoration goals. Long-term, this project will help inform restoration, plant-material selection, and strategic SOS collections around model workhorse or 'winner' plants that can endure degraded states to foster biodiversity and ecosystem functioning (Fant, Kramer, Larkin, Skogen, Yates, and Havens-Young).

Designing Decision Support Tools for Invasive Species Management: With a grant from the U.S. Fish and Wildlife Service, we have developed an internet site for land managers dealing with invasive species that integrates monitoring, management objectives, and actions with predicted outcomes determined through the monitoring efforts – ultimately

uniting scientific research with conservation practice. Developed after years of collaborative work, the site promotes cooperative learning and facilitates more rapid, adaptive management among land managers who would otherwise be dealing with a common problem on their own and learning more slowly. The tool is currently being used by National Wildlife Refuge managers throughout the Great Plains to more effectively control Kentucky Blue Grass and Smooth Brome Grass that have invaded prairies. We are adapting the tool for application in the Midwest and Northeast to help managers remove Reed Canary Grass and *Phragmites* from wetlands (Lonsdorf, Jacobi, and Larkin).

Ecological Restoration Alliance: In 2011, the Garden collaborated with Botanic Gardens Conservation International (BGCI) and several other gardens involved in ecological restoration to form the "Ecological Restoration Alliance of Botanic Gardens," with the goal of restoring 100 significant sites on six continents over the next 20 years. Both a strategic and a business plan for the alliance are under development (Havens-Young, Kramer, and outside collaborators).

The Contribution of Fungal Macromolecules to Soil Carbon Sequestration: Fungi constitute a major portion of belowground biomass in many soils, and thus, are considered to be a major contributor to carbon sequestration. While there has been substantial research directed toward defining the roles that fungi play in the soil carbon cycling, and especially toward measuring biomass and activity, there is very little information on how long fungal tissues persist in the soil and in what chemical form. We are currently completing the first step of a chemical analytical survey of soil fungi. Information from this survey will be used to determine which fungi might produce materials that could persist in soils, and which fungal compounds persist. (Egerton-Warburton, Levinson, Wilson, and Blair).

Soil Fungi as Novel Sources of Biodiesel: Fungi may produce biomass containing up to 50-60% lipid (fats). The bulk of the lipids is easy to extract and readily converted to biodiesel thereby making fungi ideal candidates for biofuel screening. We have isolated and cultured 100 different molds and yeasts from prairie and forest soils, and are currently analyzing their lipid content. Preliminary results show potential with one very high-yielding fungal isolate (Egerton-Warburton, Levinson, Wilson, and Blair).

Building Capacity for the Conservation of Mushrooms and Related Fungi: Fungi are rarely included in discussions or action plans for conservation. This is due to insufficient communication about the critical role that fungi play and the threats that they face, as well as an insufficient focus on research to obtain the needed data to better understand how fungi are responding to anthropogenic and other threats. In 2011, efforts continued to move this agenda forward through chairing the IUCN Specialist Group on "Mushrooms, Brackets, and Puffballs;" helping establish the International Society for Fungal Conservation; and organizing workshops, symposia, and short courses at local, national, and international conferences (Mueller).

Natural Areas Conservation and Management: The Garden's 200+ acres of natural areas, including McDonald Woods, Dixon Prairie, Brown Nature Reserve, Skokie River Corridor, and the Garden Lakes, are managed to enhance habitat quality and increase native flora and fauna diversity. Invasive plants, in particular, pose significant threats to these ecosystems. During 2011, a prescribed burn was conducted throughout the gravel hill

prairie. The eastern shoreline of the Brown Nature Reserve's pond was plugged with over 7,200 native plants. All flowering garlic mustard was removed from the entire 100-acre McDonald Woods. Through a partnership with the U.S. Army Corps of Engineers, a project to repair and replant 1-1/4 miles of eroding shoreline in the Garden's North Lake broke ground.

Documenting and Understanding Diversity

Revision of the Genus *Artocarpus* (Moraceae): With a NSF grant, the Garden is working with international collaborators in Southeast Asia to study the distribution and evolution of an economically important group of plants. With approximately 60 species, the genus *Artocarpus* is the third largest genus in the plant family that contains figs and mulberries (Moraceae). *Artocarpus* contains numerous economically important species (grown for timber and fruit) native to Southeast Asia. Two species, jackfruit and breadfruit, are cultivated throughout the tropics. By collecting location data, herbarium samples and DNA from plants, the goal of this project is to produce a comprehensive taxonomic revision of *Artocarpus* with discussion of character evolution and ecology, distribution maps, identification keys, and online access to an image database. Information on breadfruit and jackfruit origins and cultivar diversity will also be included in the revision. This work will be published in hardcopy and on the web. In 2011, work on the project focused on analyzing DNA fingerprinting data from plant samples collected in Bangladesh, and herbarium research in Europe (Zerega and outside collaborators).

Fossil Plants in Mongolia: A team of paleobotanists from Chicago Botanic Garden, Yale University, and Niigata University (Japan) joined colleagues in Mongolia for field work to search for early fossil flowers and remains of other fossil plants. The origin and early evolution of flowers can only be documented from the fossil record. Mongolia has an abundance of fossil deposits that date to the early Cretaceous (approx. 100-130 million years ago), when flowering plants first appear in the fossil record and then rapidly diversified Although much work has been done in Mongolia searching for dinosaurs, very little paleobotanical field work and research has been undertaken in Mongolia. This new project seeks to document fossil plants from several localities that have exceptional preservation of plant material (Herendeen).

Evolutionary Relationships and Diversity in the Legume Family: The legume family, which includes important crop plants (e.g., beans, peas, soybean) and many other economically important species, is the third largest plant family with approximately 730 genera and 19,400 species found in all parts of the world. In addition to being the source for economically important plants, the family is also important because legumes dominate many tropical ecosystems. An international team of botanists is working to develop a better understanding of the diversity and evolutionary relationships in this important family. During 2012 this team will work to organize data on diversity and evolutionary relationships in preparation for an International Legume Conference in South Africa in January 2013 where we will present a new classification system for the family. (Herendeen and Radosavljevic).

Biodiversity, Biogeography and Conservation of *Cantharellacae*: *Cantharellace* includes choice edible fungi such as chanterelles and trumpet fungi. They also are important

beneficial symbionts of forest trees. Many species in the group are listed as threatened and endangered in countries that list fungi. Activities in 2011 focused on completing work on the species found in a unique forest in Guyana (publication submitted) and submitting a NSF preproposal to expand the work globally (Mueller, Wilson, and external collaborators).

Biodiversity, Biogeography and Conservation of *Laccaria*: *Laccaria* has been used as a model group to study fungi that form ectomycorrhizas (beneficial symbionts of forest trees). Mueller is regarded as the world expert of *Laccaria*. Activities in 2011 focused on generating the remaining DNA data and fieldwork needed to complete the most comprehensive study of diversity, evolutionary relationships, and biogeographic patterns of any genus of ectomycorrhizal fungi (Mueller, Wilson, and external collaborator).

Developing Tools to Analyze the Population Biology of Mushrooms and Related Fungi: Lack of information on the population biology of fungi has greatly hindered efforts to include them in conservation discussions and action plans. Studies have been severely limited by difficulties in obtaining enough genetic markers to differentiate among individuals and populations and to examine issues such as fragmentation and potential over-harvesting for food. A pilot project to use newly developed high-throughput DNA sequencing tools to obtain informative markers was undertaken in 2011. A NSF preproposal to expand this study based on the successful pilot was submitted (Mueller, Wilson, Wickett, Fant, and collaborators at University of Chicago and Argonne National Laboratory).

Ancient Diversification of Land Plants: As part of a collaboration with the 1KP project (a multidisciplinary consortium of plant biologists and bioinformaticians led by researchers at the University of Alberta and BGI-Shenzhen), we are developing methods to process large amounts of DNA sequence data that will be applied to understanding the evolutionary relationships of all major lineages of land plants. Plants colonized land approximately 470 million years ago, diverging from their aquatic, green-algal ancestors. Understanding how all land plants and their ancestral green algae are related will allow us to better understand how fundamental plant traits evolved. Over the past several decades, these relationships have primarily been reconstructed using a small amount of DNA sequence data or a small number of species. To overcome some of these limitations, the 1KP project is using tens of thousands of gene sequences, and targeting over 1,000 species, to resolve the ancient events in land plant diversification with more confidence. (Wickett with outside collaborators).

Research Collections: Biological collections have multiple uses and take multiple forms. One area placing an increasing demand on collections is for the use of documenting genetic information; including phylogenetic studies, quantifying diversity in collections, identifying historic changes and origins, etc. To meet these demands, we are beginning to collect and accession separate samples for the express purpose of using them for genetic studies. Currently we have accessioned over 4,500 samples, which have come from a broad variety of sources at the Garden including Living Collections (Tankersely), Seed Bank (Vitt, Yates and Sollenberger), and the Herbarium (Zerega and Masi). Plans are also underway to add important rare species and research samples that will increase the value of this collection (Fant and Rosendorn). In 2011, the herbarium increased its collections by 1,704 specimens, bringing the total collections to 16,140. In addition, the herbarium continues to work toward digitizing its entire collection. Currently 6,400 specimens, or 38% of the collection, are digitized. The herbarium serves as a resource for scientists, students, and conservation

practitioners, hosting visitors throughout the year. In 2011, the herbarium conducted contract work for the U.S. EPA for their National Wetland Condition Assessment. This involved identifying 368 specimens that were collected from wetlands throughout the Midwest.

Building Capacity and Understanding

Conservation and Land Management (CLM) Internship Program: A total of 534 applications were received and 99 interns were hired for the 2011 CLM Internship positions. Thirteen of these interns were hired on ARRA-BLM funding, 68 were hired by the BLM (18 of these funded by the Washington Office), two were hired by the NPS, six by the USFS, four by USGS, two by USFWS and four by the Center for Plant Conservation. The BLM hosted 81 interns in 11 western states including Alaska, the USFS hosted six interns in California and Oregon, the NPS hosted two interns in Colorado and Utah, the USGS hosted four interns in Nevada, the USFWS hosted two interns in Oregon, and four interns were sponsored by the CPC in California. CLM interns worked a total of 84,404.5 hours (equates to 10,550.6 days or 479.6 months). A total of 44 interns terms were extended by a total of 34,464 hours. Thirty-nine extensions were granted by the BLM, four by the USBG, and one by the Forest Service.

CLM – American Recovery and Reinvestment Act – SOS Interns: A total of 26 teams were hired, 19 in 2010, and five in 2011. Twenty-four teams focused on seed collections and two teams provided support (seed cleaning/processing and data entry/management, based out of Bend, Oregon and Washington, DC). Fifty-four interns were hired, 44 of these in 2010 and 10 in 2011. ARRA interns made a total of 2,127 collections, surpassing the contract goal of 1,000 collections, representing 1081 species in 12 western states.

Graduate Programs: The joint graduate program with Northwestern University continues to attract top students to conduct plant conservation research. In 2011, the program welcomed seven new MS and two new PhD students. The program currently has seven PhD and 20 MS students. Seven MS students graduated in 2011; four of the recent graduates are now attending doctoral programs, and two are working in science careers. Graduates' research focused on issues related to climate change, best practices in restoration, habitat fragmentation, pollination biology on green roofs, invasive species ecology, and reproductive ecology. Students were successful at procuring grants for their field and lab research. Student fieldwork took place in the Chicago region, Wisconsin, Minnesota, the Great Basin, California, Costa Rica, and Fiji. The graduate program was the feature story in the Spring 2011 issue of Northwestern Alumni Magazine.

Plant Conservation Alliance: The Garden continues its leadership of the NGO committee of the Plant Conservation Alliance, a public/private partnership dedicated to the conservation of our native flora. In 2011, the Garden organized a lobbying effort to advocate maintenance of plant conservation funding for important government programs (Siskel and Havens-Young).

Using Plants and Fungi for Human Benefit

Plant Breeding: The plant breeding program develops and evaluates new perennial plants for introduction to the horticulture industry and gardeners. Over 1,000 seedlings were planted out, representing crosses made the previous year. Crosses were successfully made in 2011 within *Aster*, *Eupatoriadelphus*, *Oenothera*, *Phlox*, *Stachys*, and *Veronica*. Ten plant selections from the program were propagated and distributed to licensed growers of *Chicagoland Grows*® for evaluation and potential introduction. Collecting trips to Idaho, Nebraska, South Dakota, and Wyoming yielded three *Phlox* species and other genera not commercially available that will be utilized in future breeding efforts (Ault).

Plant Evaluation: The **plant evaluation** program evaluates herbaceous and woody plants in comparative trials, ultimately recommending the top-performers to gardeners and the horticulture industry. Over 1,200 taxa (representing approximately 55,000 plants) were evaluated last year in the Lavin Plant Evaluation Garden, Pullman Plant Evaluation Garden, and the green roof gardens. A new trial of *Hamamelis* (witch hazels) was initiated in 2011. Results of our trials are published in Plant Evaluation Notes; issue 35, "A Comparative Study of *Phlox paniculata* Cultivars," reported on our nine-year trial of 78 cultivars of garden phlox and their resistance to powdery mildew. A new project with *Fine Gardening* magazine began mid-year and highlights the comparative trials via three articles per year. Articles on the meadow rues (*Thalictrum*) and *Hydrangea paniculata* trials were published in 2011; the magazine has agreed to publish three stories per year through 2013 (Hawke).

***Chicagoland Grows*® Plant Introduction:** The *Chicagoland Grows* program markets itself and its plants to the horticulture industry. Two new plants were introduced this year, *Itea virginica* 'Morton' and *Veronica* 'Whitewater'. Three trade shows were attended, which resulted in six more nurseries being licensed with the program. Nearly 3,000 stock plants and cuttings were shipped out to 26 nurseries, which will increase future sales of the 13 plant selections distributed. The program's website was updated with new images and text on all the current and near-future plant introductions. In order to protect the legal properties of the program, four patent applications were submitted and two trademark names were renewed (Ault).

Economic Botany: With a grant from NSF, the Garden is working with international collaborators in Southeast Asia to study and conserve the genetic diversity of under-utilized crops. The two focal species, jackfruit (*Artocarpus heterophyllus*) and breadfruit (*A. altilis*), are cultivated throughout the tropics and may be under threat of genetic erosion. Plantings with low genetic diversity can be more susceptible to environmental stresses such as disease or droughts. This project aims to use field data and genetic evidence from jackfruit and breadfruit to identify their wild relatives, assess genetic diversity throughout their range, determine possible threats of genetic erosion, and make recommendations for germplasm conservation by working closely with international collaborators. In 2011, work on the project focused on analyzing DNA fingerprinting data from plant samples collected in Bangladesh (Zerega, Witherup, and outside collaborators).

Screening for Medicinal Compounds: Through a cooperative agreement with Professor Djaja Djendoel Soejarto at University of Illinois at Chicago, we provide plant material left over from cleaning seeds for our seed bank, which is screened for various medicinal compounds at UIC. In 2011, we provided dried plant material from 219 species to be screened (Yates, Sollenberger, Vitt, and Havens-Young).

GRANTS AND CONTRACTS ACTIVE IN 2011

Grantor/*Title*	Awardee	Amount
American Recovery and Reinvestment Act *CLM Conservation and Land Management Internship Program*	Havens-Young, Skogen	$1,250,000
Bureau of Land Management *CLM Conservation and Land Management Internship Program*	Havens-Young, Skogen	$4,800,000
Bureau of Land Management *Rare Plant Climate Envelope Modeling*	Havens-Young, Vitt, Still, Yates	$992,000
Bureau of Land Management *Restoration on the Colorado Plateau*	Havens-Young, Fant, Skogen, Larkin Yates, Tonietto, Kramer	$80,000
Bureau of Land Management *Seed collection in Wyoming*	Havens-Young, Vitt, Yates, Sollenberger	$80,000
Center for Plant Conservation *CLM Intern Program*	Havens-Young, Skogen	$75,000
Center for Plant Conservation *Lepidospartum genetic analysis*	Havens-Young, Fant	$25,000
Gaylord and Dorothy Donnelley Foundation *Plants of Concern*	Masi	$70,000
Illinois Endangered Species Protection Board *Genetic diversity and pollination biology in Asclepias lanuginosa*	Fant	$7,000
Illinois-Indiana Sea Grant *Ecological genetics of Phragmites australis invasion in southern Lake Michigan*	Larkin, Fant	$10,000
Illinois Wildlife Preservation Fund *Plants of Concern*	Masi	$28,000
Institute for Museum and Library Services *Native Seed Farms*	Havens-Young	$150,000
Institute for Museum and Library Services *Floral Report Card planning grant*	Schwarz, Havens-Young	$100,000

National Aeronautics and Space Admin. *Climate Change Education*	Schwarz, Havens-Young	$150,000
National Aeronautics and Space Admin. *Climate Change Education*	Schwarz, Havens-Young	$29,720
National Fish and Wildlife Foundation *Seeds of Success National Coordination*	Haidet, Havens-Young	$70,000
National Ecological Observatory Network *Project BudBurst*	Havens-Young, Schwarz-Ballard	$105,000
National Fish and Wildlife Foundation *Restoration on the Colorado Plateau*	Fant, Larkin, Skogen, Yates Tonietto, Kramer	$49,937
National Park Service *CLM Conservation and Land Management Internship Program*	Havens-Young, Skogen	$262,700
National Science Foundation – DEB *Future directions in biodiversity and systematics research*	Herendeen	$99,817
National Science Foundation – LTREB *Cirsium pitcheri demography and genetics*	Havens-Young, Vitt, Fant, & outside colleagues	$300,000
National Science Foundation – LTREB *Echinacea angustifolia research*	Wagenius	$225,000
National Science Foundation – MRI *GIS Lab Equipment*	Vitt, Havens-Young, Fant, Larkin Skogen, Yates	$305,000
National Science Foundation – MRI *Seed X-Ray Equipment*	Havens-Young, Vitt Skogen, Yates, Sollenberger	$135,000
National Science Foundation – REU *Research Experiences for Undergraduates*	Larkin, Fant	$301,307
National Science Foundation – REU *Summer field research experience for an undergraduate student*	Wagenius	$7,000
National Science Foundation – RET *Summer field research experience for a high-school teacher*	Wagenius	$8,986
National Science Foundation – REVSYS *Phylogeny and revision of* Artocarpus	Zerega	$319,361

The Nature Conservancy *Plants of Concern*	Masi	$475
Northwestern University Institute for Sustainable Energy	Egerton-Warburton	$45,000
Openlands *Plants of Concern*	Masi	$19, 471
Royalty Income From Plant Introduction Program	Ault	$130,000
U.S. Army Corps of Engineers *North Lake Shoreline Restoration*	Kirschner	$3,769,943
U.S. Botanic Garden *Global Climate Change Monitoring Gardens*	Havens-Young, Schwarz	$50,000
U.S. Botanic Garden *CLM Conservation and Land Management Internship Program*	Havens-Young, Skogen	$50,000
U.S. Environmental Protection Agency *Enhancing the capacity of wetland programs to assess and manage habitat for secretive marshbird support*	Larkin	$115,712
U.S. Fish and Wildlife Service *Implementing adaptive control of Phragmites australis on stations in the Northeast Region of the U.S. National Wildlife Refuge System*	Lonsdorf, Jacobi	$363,381
USDA Forest Service *Conservation and Land Management Internship Program*	Havens-Young, Skogen	$100,000
USDA Forest Service *Optimal Monitoring Guidelines*	Havens-Young, Skogen, Vitt	$40,000
USDA Forest Service *Seed Banking*	Havens-Young, Vitt, Yates, Sollenberger	$60,000
USDA Forest Service/Midewin Plants of Concern	Masi	$17,500
Total Active Grants (for 2011)		**$14,797,310**

Year	Total Grants	Number of Grants	Average Grant
2004	$5,410,452	29	$186,567
2005	$6,498,018	38	$171,000
2006	$9,415,030	31	$303,710
2007	$7,196,973	35	$205,628
2008	$10,415,756	31	$335,992
2009	$11,630,528	38	$314,339
2010	$13,290,572	43	$309,083
2011	$14,797,310	41	$360,910

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Hawke, R. 2011. A Comparative Study of *Phlox paniculata* Cultivars, Plant Evaluation Notes, Issue 35.
Hitzroth, G. 2011. Plants of Concern Monitors Hard at Work Saving Chicago's Rare Plants. *The Habitat Herald.* 12(1):6, January 2011 (on-line December 2010.)
G. Hitzroth. 2011. Plants of Concern uses GPS to protect rare plants. The Habitat Herald. 12 (3): 6
Masi, S. and G. Hitzroth. 2011. *Plants of Concern Volunteer Manual.*
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Reports

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Hawke, R. 2011. A Summary of the Performance of Proven Winners Plant Introductions, Proven Winners, St. Thomas, Missouri.
Hawke, R. 2011. Hardiness and Performance Report of English Roses: A report to David Austin Roses, England.
Hawke, R. 2011. Performance Report of Perennial Introductions: A report to Blooms of Bressingham, England.
Hawke, R. 2011. A Summary of the Performance of North Creek Nurseries Plant Introductions, North Creek Nurseries, Landenberg, Pennsylvania.
Hawke, R. 2011. A Summary of the Performance of Intrinsic Perennial Gardens Introductions, Hebron, Illinois.
Hawke, R. 2011. A Summary of the Performance of Perennial Introductions: A report to Monrovia Growers, Azusa, California.
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Hawke, R. 2011. A Summary of the Performance of Perennial Introductions: A report to de Vroomen Garden Products, Lisse, The Netherlands.
Hawke, R. 2011. A Performance Summary Report to Ball Horticultural Company, West Chicago, Illinois.
Hawke, R. 2011. A Summary of the Performance of Perennial Introductions: A report to Great Garden Plants, Holland, Michigan.
Hawke, R. 2011. A Summary of the Performance of Perennial Introductions: A report to Walters Gardens, Zeeland, Michigan.
Herendeen, P. 2011. Future directions in biodiversity and systematics research, Annual report to the National Science Foundation.
Herendeen, P. 2011. Program Director annual report, American Society of Plant Taxonomists.
Herendeen, P. 2011. Annual report, Systematics Section, Botanical Society of America.

Masi, S. and G. Hitzroth. 2011. Openlands Lakeshore Preserve monitoring project, pilot 2010. Final report to Openlands.

Masi, S. and G. Hitzroth. 2011. 2010 monitoring reports to 69 Plants of Concern landowner partners.

Masi, S. Permit reports to Illinois DNR and Illinois Nature Preserves Commission, Forest Preserve and Conservation Districts, for monitoring and research work at their sites.

Masi, S. and G. Hitzroth. 2011. Plants of Concern. Mobilizing citizen scientists. Final report for two-year grant to the Illinois Wildlife Preservation Fund, IDNR.

Masi, S. and T. Skyba. 2011. Monitoring rare plants at Midewin National Tallgrass Prairie: 2001-2009. Focus on the 2010 monitoring season. Final report to United States Forest Service at Midewin National Tallgrass Prairie.

Media and General Outreach

Several staff, including Pati Vitt and Bob Kirschner, were featured in a Discovery Channel Dirty Jobs episode "Doomsday Seedbanker" that first aired on December 27, 2011.

Ault, J. 2011. American Nurseryman online version of New Plants for 2012: Echinacea 'Burgundy Starburst (pg. 3), Polygonatum 'Prince Charming' (pg. 4) and Veronica 'Tidal Pool' (pg. 4). http://media.mooserivermedia.com/pdf/2012/AN/AN_2012Perennials.pdf

Ault, J. 2011. Morton Virginia Sweetspire – Scarlet Beauty™. Mid-America Horticultural Trade Show New Products. http://midam.org/Exhibit%20Locators/MidAmExhibitorNewProducts.html#Morton

Ault, J. 2011). Tidal Pool Speedwell. Mid-America Horticultural Trade Show New Products. http://midam.org/Exhibit%20Locators/MidAmExhibitorNewProducts.html#Whitewater

Echinacea Old time species and new hybrids provide exceptional garden perennials. Greenhouse Management. January 1, 2011.

New Plant Pavilion. Nursery Management. January 1, 2011.

Wisconsin Nursery Association names plants of the year (State Street Miyabe Maple). Lawn and Landscape online, January 4, 2011. http://www.lawnandlandscape.com/Article.aspx?article_id=111420

Winter-weary gardeners can't help but succumb to the lure of new plants. Here are a few to melt, not break, your heart. Chicago Tribune online, January 6, 2011. http://articles.chicagotribune.com/2011-01-06/features/ct-sun-garden-0109-new-plants-20110106_1_heirloom-tomato-tomato-growers-supply-lycopersicon-esculentum/2

Top-Performing Morton Arboretum Shrub Hits The Market. TribLocal Lisle, Illinois. January 21, 2011. http://triblocal.com/lisle/community/stories/2011/01/top-performing-morton-arboretum-shrub-hits-the-market/

Shady Moves a garden for native plants doesn't always require full sun. Chicago Tribune. February 13, 2011. 18,19.

More than a pretty place. Horticulture Magazine. February/March 2011.

Top-performing Morton Arboretum shrub hits market. Nursery Management online. March 10, 2011. http://www.nurserymanagementonline.com/Article.aspx?article_id=113828

Morton Arboretum's New Sweetspire. The American gardener online, pgs. 52-53. March April 2011 Issue. http://theamericangardener.org/publication/?i=76331&p=50

New Scarlet Beauty sweetspire good for Hampton Roads gardens. Daily Press, Newport News, Virginia. April 17, 2011. http://weblogs.dailypress.com/features/gardening/diggin-in/2011/04/new_scarlet_beauty_sweetspire_1.html

How to Bring Splashes of Fall Color. West Suburban Living. September/October, 2011.62-64.

Other public outreach included:

Megan Haidet – content for Seeds of Success website http://www.nps.gov/plants/sos/training/index.htm

Echinacea Project (Wagenius) launched New Media initiative on web (echinaceaProject.org), Facebook (www.facebook.com/echinaceaProject) and Twitter (twitter.com/#!/TeamEchinacea).

Echinacea Project (Wagenius) sponsored float in the Harvest Festival Parade, Hoffman, MN 14 August 2011.

Susanne Masi – audio interview for Openlands website on Openlands Lakeshore Preserve monitoring program.

Plants of Concern: newsletters of stewardship groups publicized POC workshops and opportunities: Gatherings Online (TNC); Habitat Herald (Chicago Audubon); The Fenship Newsletter (Friends of Bluff Spring Fen); Grounds Cover (CBG Volunteer Newsletter); The Acorn (McHenry County Natural Area Volunteers), and others.

Susanne Masi, Greg Hitzroth, Tatiana Skyba created and staffed a Plants of Concern information booth at Wild Things Stewardship Conference, University of Illinois/Chicago. March 5.

Dixon National Tallgrass Prairie Seed Bank Corporate Volunteer Days:
- April 28 – Bank of America volunteer day
- April 29 - Astellas Pharmaceutical volunteer day
- June 9 - Harris Bank volunteer day
- July 22 – Cardinal Health volunteer day
- August 1 – Discover Financial volunteer day
- September 21 - Abbott Laboratories volunteer day
- September 27 – HSBC-Earthwatch volunteer day
- October 20 – Motorola volunteer day
- October 20 – Blackman Kallick volunteer day

Dixon National Tallgrass Prairie Seed Bank involvement with HSBC Climate Partnership through the Earthwatch Institute

Dixon National Tallgrass Prairie Seed Bank Elderhostel workday, May 19, Road Scholar Elderhostel.

Dixon National Tallgrass Prairie Seed Bank High School workday, April 25, Glenbrook South High School.

Dixon National Tallgrass Prairie Seed Bank hosted 4 Missouri Botanical Garden staff, May 17, seed bank and lab tour.

Dixon National Tallgrass Prairie Seed Bank participation in World Environment Day, June 4, provided demonstrations, slide shows of microscope seed images, a tour of the Dixon prairie for visitors.

E. Yates – creation of screen displays and maps for GIS Lab, World Environment Day.

AWARDS & INVENTIONS

Emily Yates received GISP (Geographic Information Systems Professional) Certification through the GIS Certification Institute (http://www.gisci.org), June 2011.

Chrissy McNulty received the Downers Grove Garden Club Scholarship which recognizes scholarly excellence and research potential of M.S. or Ph.D. students working in the following fields: conservation, landscape architecture/design, natural resources, human dimensions of the environment, or horticulture ($1,000).

Soil lab intern Ekjyot (Joey) Gill received an Undergraduate Research Grant from Northwestern University for his project, 'The Role of Fungi on Rock and Mineral Weathering' ($1,000).

PRESENTATIONS & WORKSHOPS

J. Ault

Chicagoland Grows® plant introduction program. Staffed display booth and discussed program and plant introductions with attendees during trade show. National Green Centre Trade Show, St. Louis, Missouri. January 9-10.

Chicagoland Grows® plant introduction program. Staffed display booth and discussed program and plant introductions with attendees during trade show. Mid-America Horticultural Trade Show, Chicago, Illinois. January 19-21.

From Native Habitats to Your Landscapes: Adapting Our Natural Plant Heritage. Invited presentation, 55th Annual Iowa State University Shade Tree Short Course, Ames, Iowa. February 24 and 25, 2011.

Developing New Perennials for Midwest Gardens. Invited lecture for Plant Propagation and Introduction to Horticulture students at College of Lake County, Grayslake, Illinois, March 16, 2011.

Chicagoland Grows® plant introduction program. Staffed display booth and discussed program and plant introductions with attendees during trade show. OFA Short Course and Trade Show, Columbus, Ohio. July 10-12.

L. Egerton-Warburton

Plant protection from soil pathogens by arbuscular mycorrhizal fungal communities. Martell-Pina, E.*, O'Shaughnessy, J., and Egerton-Warburton, L.M. Ecological Society of America Annual Meeting, Austin TX, August 2011. * REU intern.

The effects of invasive European buckthorn and restoration on microbial metabolic processes and fungal communities in an oak woodland. Pieri, D.*, Bailey, L.*, Wilson, A. and Larkin, D., and Egerton-Warburton, L.M. Ecological Society of America Annual Meeting, Austin TX, August 2011. *Undergraduate co-presenters.

Differences in depth to groundwater modulates the mycorrhizal responses of oak trees to interannual rainfall variability. Egerton-Warburton, L.M, Querejeta, J.I., and Allen, M.F. Invited Symposium Presentation, Ecological Society of America Annual Meeting, Austin TX, August 2011.

J. Fant

Glacial migration, biogeography and conservation of a narrow endemic thistle, Cirsium pitcheri. Lake Forest College Biology Department Fall seminar series

Restoration genetics and the genetic, demographic and community factors that influence restoration success. Western Forestry Genetics

Careers in Conservation Genetics and Molecular Ecology. Malcolm X College Third Annual Biology Career Seminar

M. Haidet

Seeds of Success. Invited presentation, Association for Zoological Horticulture Annual Conference, Wichita, KS, October, 2011.

Seeds of Success. Invited presentation, Bureau of Land Management, Plant Conservation Program Meeting, Sheperdstown, WV, January, 2011.

K. Havens-Young

Demographic Modeling of Invasive Plant Cultivars, an invited departmental seminar at Illinois Institute of Technology, Chicago, IL.

Plant Responses to Climate Change, talk and panel discussion at Wild Ones Annual Meeting, Chicago, IL.

Citizen Science Programs at Chicago Botanic Garden, gave talk and participated in the Syracuse University Citizen Science Workshop, Adirondacks, NY.

Ecological Restoration at Chicago Botanic Garden, gave talk and participated in the Botanic Gardens Conservation International Ecological Restoration Workshops in New York and Kenya.

Plants and Climate Change, plenary talk to the Golden Apple Teachers Meeting, Chicago, IL.

Assisted Migration of Plants, an invited plenary presentation at the Global Partnership for Plant Conservation meeting, St. Louis, MO.

Demographic Modeling of Invasive Plant Cultivars, Weed Science Society of America meeting, Milwaukee, WI.

R. Hawke

Four-Star Perennials, Invited presentation, 15th Annual P.L.A.N.T. Seminar, Ohio State University. Columbus, OH, January 23, 2011.

When Pretty Isn't Enough. Invited presentation, Indianapolis Museum of Art. Indianapolis, IN, February 10, 2010.

Proven Perennials for Northern Gardens. Invited presentation, Antioch Garden Club, Antioch, IL, April 4, 2011.

Proven Perennials. Invited presentation, Georgia Perennial Plant Association. Atlanta, GA, April 12, 2011.

Sorting Out the Coneflowers. Invited presentation, Perennial Plant Association National Symposium. Atlanta, GA, July 21, 2011

The Importance of Plant Trials. Invited presentation, Perennial Plant Association Northeast Region Perennial Symposium. Boston MA, September 15, 2011.

The Best of the Best. Invited presentation, Rotary Botanical Gardens. Janesville, WI, November 5, 2011.

P. Herendeen

Symposium co-organizer (with Anne Bruneau, Univ. Montreal), "An overview of legume systematics: toward a phylogenetic classification of the family," International Botanical Congress, Melbourne, Australia. July, 2011

Symposium co-Organizer (with Richard Ree, Field Museum), "Chicago Plant Science Symposium." Co-sponsored by The Field Museum, Chicago Botanic Garden, and International Journal of Plant Sciences. Field Museum, April 16, 2011.

Progress toward a comprehensive molecular phylogeny of legumes: are we almost there? Herendeen, P.S., M. Wojciechowski, and M. J. Sanderson. Symposium paper at the International Botanical Congress, Melbourne, Australia. July 2011.

Careers in plant paleontology and conservation biology; opportunities at Chicago Botanic Garden. Science Day lecture, Stevenson High School, Lincolnshire, IL. May 25, 2011.

Plant paleontology: a window into environments of the past, World Environment Day, Chicago Botanic Garden. June 4, 2011.

Early evolution of flowering plants; Internship and Training Opportunities at Chicago Botanic Garden. Illinois State University, School of Biological Sciences. January, 2011.

R. Kirschner

Shorelines That Work: Native Plantings Heal Erosive Water Landscapes and Provide Impressive Visual Appeal, keynote address at Michigan Wildflower Association Annual Conference, East Lansing, MI.

*Great Plants for Rain Gardens, Shorelines, and Other Wet Places, s*eminar at Chicago Flower and Garden Show, Chicago, IL.

Shoreline Restoration Stimulates Environmental Research – and New Venues for Public Appreciation of Native Plants, presented to the Illinois-Indiana Sea Grant College Program's leadership retreat held at the Chicago Botanic Garden, Glencoe, IL.

D. Larkin

Ecology and genetics of Phragmites australis *invasion in the Chicago region*, a presentation to the Chicago Wilderness Natural Resources Management Team, Chicago, IL.

The Prairie–Forest Continuum in Northeast Illinois, keynote talk to the Golden Apple Teachers Meeting, Chicago Botanic Garden.

Terrestrial habitats of the Chicago region, presentation to high-school teachers. Chicago Botanic Garden.

Benign invaders and sleeper weeds: using herbarium data to study the dynamics of plant invasions, seminar at Morton Arboretum, Lisle, IL.

When the species concept and land management collide: Phragmites australis *invasion in the Chicago region*, Chicago Plant Science Symposium, Chicago, IL.

Lying in the weeds: lag phases in upper-Midwest plant invasions, seminar at Northeastern Illinois University, Chicago, IL.

E. Lonsdorf

Multi-scale modeling for integrated migratory bird management, The Wildlife Society annual meeting, Waikaloa, Hawaii.

The birds and bees of jobs in ecology and conservation, seminar at Carleton College, Northfield, MN.

S. Masi

Ten years of citizen-based rare plant monitoring. Oral presentation at Wild Things Stewardship Conference, University of Illinois Chicago, March 5. With Greg Hitzroth.

Whether and how to include endangered and threatened species in restoration seed mixes or other types of distribution: current policies, practices, knowledge and guidelines. Panel organizer and moderator. Wild Things Stewardship Conference, University of Illinois Chicago, March 5.

Plants of Concern: rare plants in our region. Presentation at World Environment Day, Chicago Botanic Garden, June 4.

Plants of Concern. Training Workshops for Citizen Science Monitors. Co-taught 4 training workshops held in different parts of the region during April/May. With G. Hitzroth.

Plants of Concern: Volunteers Monitor Rare Plants in a Standardized Regional Program. Presentation to Northwestern University Graduate Students, Chicago Botanic Garden. With G. Hitzroth and T. Skyba. October 14,

Plants of Concern: citizen scientists track rare plants for 10 years: program description and results. Oral presentation at the 38th Natural Areas Conference, Florida State University Conference Center, Nov. 1-4. Co-author, G. Hitzroth.

Plants of Concern: citizen scientists monitor rare species in Chicago Wilderness. Presentation at Illinois Department of Natural Resources staff meeting, October 18, 2011, Springfield, IL. With G. Hitzroth.

G. Mueller

Conserving mushrooms and their relatives. Latin American Mycological Congress, San José, Costa Rica.

Climate change and fungal conservation. European Mycological Congress, Greece.

Laccaria from the eastern Himalayas. Mycological Society of America Annual Meeting, Fairbanks, Alaska.

Telling the conservation story: Chicago Botanic Garden. Midwest Museum Conference, Chicago. Illinois.

Participant in panel discussion / workshop focused on implementation of the GSPC at institutional level. Global Partnership for Plant Conservation Meeting, St. Louis, Missouri.

Symposium on fungal conservation, Latin American Mycological Congress, San José, Costa Rica.

J. O'Shaughnessy

Prairies: Remnant, Reconstructed, Created, Garden … A Continuum, workshop for Annual Conference of Garden Clubs of Illinois, April 17, 2011.

Constructed Gravel Prairie – 20 Year Analysis, poster presentation at 38th Natural Areas Conference, Florida State University Conference Center, Nov. 1-4.

D. Sollenberger

The Dixon National Tallgrass Prairie Seed Bank: Conserving Native Plant Diversity by Collecting and Banking Seeds Across the Midwest. 2011 Iowa Prairie Conference. July, 28.

P. Vitt

Conservation: Global to Local a Matter of Scale, Riveredge Nature Center, Saukeville, WI, April 29, 2011.

S. Wagenius

Ecological and genetic constraints on reproduction in a common prairie plant. Kellogg Biological Station, Michigan State University, 25 February, 2011.

N. Wickett

Using stage-specific cDNA sequencing to uncover the origin and evolution of parasitism in Orobanchaceae. Wickett, N. J., L. A. Honaas, E. Wafula, M. Timko, J. Westwood, J. Yoder, and C. W. dePamphilis. Botany 2011, St. Louis, MO, July 9-13.

Reconstructing plant phylogenies using the cDNA sequences of over 900 low copy nuclear genes. Wickett, N. J., J. Duarte, E. Wafula, J. Leebens-Mack, and C. W. dePamphilis. Botany 2011, St. Louis, MO, July 9-13.

Using stage-specific cDNA sequencing to understand the evolution of parasitism in the plant family Orobanchaceae. San Francisco State University, March 1.

Ancestral polyploidy in seed plants and angiosperms. Jiao Y., N. J. Wickett, S. Ayyampalayam, A. Chanderbali, L. Landherr, P. E. Ralph, L. P. Tomsho, Y. Hu, H. Liang, D. E. Soltis, S. W. Clifton, S. E. Schlarbaum, S. C. Schuster, H. Ma, J. Leebens-Mack, and C. W. dePamphilis. Plant & Animal Genomes XIX, San Diego, CA, January 15-19.

The evolution of weediness in parasitic plants of the Orobanchaceae. Westwood J., M. Fernandez-Aparicio, M. Das, S. Alford, V. Stromberg, N. J. Wickett, K. Huang, B. Wu, J. Yoder, M. Timko, and C. W. dePamphilis. Plant & Animal Genomes XIX, San Diego, CA, January 15-19.

A. Wilson

FESIN: Fungal Teaching Workshop. August 2011, Fairbanks, AK.

Invited Presentations

- Plant Biology and Conservation Seminar: Northwestern University, Evanston, Illinois. November 2011.
- A. Watson Armour Research Seminar: Field Museum of Natural History, Chicago, Illinois. April 2011.

Evolution and biogeography of ectomycorrhizal associations in an enigmatic group of fungi, the Sclerodermatineae (Boletales, Basidiomycota). Wilson A. W., Binder M. and Hibbett D. S. Contributed paper. Botanical Society of America. July 2011, St. Louis, MO.

Laccaria *from the eastern Himalaya.* Wilson A. W., Hosaka K. and Mueller G. M. Contributed poster. Mycological Society of America. August 2011, Fairbanks AK.

The effects of invasive European buckthorn and restoration on microbial, metabolic processes and fungal communities in an oak woodland. Pieri D. S., Bailey L. A., Wilson A. W., Larkin D. J., and Egerton-Warburton L. S. Contributed poster. Ecological Society of America Annual Meeting, August 2011, Austin, TX.

E. Yates

Exploratory and GIS-based spatial analysis of rare plant species in the Chicago Region . Association of American Geographers (AAG) annual meeting, Seattle, WA, April 12-16. Co-authors: Susanne Masi and Greg Hitzroth.

GIS network analysis & circuit theory investigate geneflow in the narrow endemic thistle, Cirsium pitcheri. Illinois GIS Association Fall Conference, Naperville, IL, October 18-19. Co-authors: Jeremie Fant, Kayri Havens, John M. Keller, and Aleksandar Radosavljevic.

Seeds of Success workshop for CLM internship training at Chicago Botanic Garden. Led 40 interns in seed collecting techniques in the field, with M. Haidet and D. Sollenberger.

N. Zerega

Jackfruit diversity in Bangladesh. Chicago Botanic Garden Student Research Symposium. Glencoe, IL, August 18, 2011.

*Measuring and preserving diversity in a Bangladeshi food crop: Jackfruit (*Artocarpus heterophyllus, *Moraceae)*. Botany 2011, St. Louis, MO, July 11, 2011.

Science and society: A path to a career in science, Keynote address at the Student Center for Science Engagement Annual Student Research Symposium at Northeastern Illinois University, Chicago IL, Sept. 16, 2011.

Jackfruit, Anyone? Unusual Foods and Why They Are Important. Presentation to the public as part of World Environment Day activities at the Chicago Botanic Garden, June 4, 2011.

Origins, Diversity, and Conservation of Under-utilized Crops: Studies in Artocarpus (Moraceae). Seminar Series at Claremont College and Rancho Santa Ana Botanic Garden, May 6, 2011.

Diversity in the Mulberry family (Moraceae): Examples from pollination and plant cultivation. Biology Seminar Series at Saint Louis University, February 18, 2011.

TEACHING & MENTORING

J. Ault

Supervised/mentored Sarah Moy, plant breeding and introduction intern.

L. Egerton-Warburton

Field and Laboratory Methods in Plant Biology and Conservation (Fall 2011), Northwestern University

High school students advised (College First):

Brendan Radford
Vanessa Duran

Undergraduate students advised:

William Levinson (Lake Forest College)
Ana De La Torre (Lake Forest College)
Ekjyot Gill (Northwestern University)
Dayani Pieri (NIU)

Graduate students advised or committee member:

Robert Hevey (NU)
Nik Desai (NU)
Lauren Umek (NU)
Benjamin Morgan (NU)
Corey Palmer (NU)

J. Fant

Graduate students advised or committee member:

Anna Braum (Current MA, NU)
Kelly Ksiazek (MA 2011, NU)
Becky Barak (Current MA, NU)
Emily Booth (MA 2011, NU)
Joshua Drizin (Current MA, NU)
Melissa Gray (MA 2011, NU)
Eun Sun Kim (Current PhD, UIC)
Amy Price (MA 2011, NU)

Ricardo Rivera (Current MA, NU)
David Zaya (Current PhD, UIC)
Undergraduate students advised
Adewale Adeoba (Loyola University)
David Ford (Loyola University)
Charles Flowe (Trinity Int Uni)
Shayla Hobbs (UIUC)
Hannah Weinberg-Wolf (John Hopkins)
High School and College First students mentored
Nicole Baylon (St Martin de Porres High School)
Laura Kochlefl (New Trier High School)
Jazmine Hernandez (College First)
Allison Buiser (College First)

M. Haidet
Seed Collection for Conservation and Restoration Training Course. Denver, CO
Conservation and Land Management Intern Training Workshop. Glencoe, IL

K. Havens-Young
Regional Conservation (Fall 2011), University of Illinois Chicago
Conservation and Land Management Intern Training Workshop. Chicago Botanic Garden.
Graduate students advised or committee member:
J. Alyah (MS at NU)
J. Schwarz (MS at NU)

R. Hawke
Top Perennial Picks. Enrichment Course, School of the Botanic Garden. Glencoe, IL, June 1, 2011.
Herbaceous Perennials. Ornamental Plant Materials Certificate, School of the Botanic Garden. Glencoe, IL, July 19-August 30, 2011.

P. Herendeen
The Nature of Plants: Northwestern University (Spring 2011).
Graduate students advised or committee member:
Aleksandar Radosavljevic (PhD at NU)
Colleen Michael (MS at NU)

D. Larkin
Director, Research Experiences for Undergraduates (REU) site Program in Plant Biology and Conservation
Plant Community Ecology (Spring 2011), Northwestern University
Field and Laboratory Methods in Plant Biology and Conservation (Fall 2011), Northwestern University
Ecology and Materials Workshop I: Plants and Planning (Fall 2011), Illinois Institute of Technology
Undergraduate students advised:
Becky Cotteleer (Albion College)
Evan Eifler (University of Wisconsin)

Thea Klein-Mayer (Northwestern University)
Lisa Mithun (Northwestern University)
Allegra Mount (Northwestern University)
Tyr Wiesner-Hanks Northwestern University)

Graduate students advised or committee member:

Jennifer Alyah (NU)
Rebecca Barak (NU)
Ryan Disney (NU)
Wesley Glisson (NU)
Melissa Gray (NU)
Paul Hartzog (NU) advanced to doctoral candidacy in 2011
Kelly Ksiazek (NU)
Amy Price (NU) defended M.S. in 2011
Rebecca Tonietto (NU) advanced to doctoral candidacy in 2011
Byron Tsang (NU)
Erin Vander Stelt (NU)

E. Lonsdorf

Postdoctoral Students

Christina Kennedy – Lincoln Park Zoo

Graduate students advised or committee member:

Wesley Glisson (NU)
Victoria Hunt (UIC)
Brook Herman (UIC)
Cliff Shierk (UIC)
Rebecca Tonietto (NU)

S. Masi

Co-taught four Plants of Concern Volunteer Training workshops throughout the region in April/May. With G. Hitzroth.

Coordinated and mentored group volunteer monitoring field days throughout the season at Illinois Beach State Park, Sand Ridge Savanna, Florsheim Nature Preserve, Dixie Briggs Fromm Nature Preserve, Waterfall Glen and Hickory Creek Barrens. With G. Hitzroth.

Supervised/mentored Susan Helford, ACI intern.

Mentored Daniel Fink, MS student at Northeastern Illinois University – thesis committee.

Mentored Evanston HS Honors Biology Student Eliza Abendroth in a 20-hour internship with Plants of Concern.

G. Mueller

Basidiomycota, Pre-Congress Course Latin American Mycological Congress, Guanacaste, Costa Rica. With A.E. Franco.

Workshop on red-listing fungi. Congress of European Mycology. Porto Carras, Greece. With A. Dahlberg and B. Senn-Irlet.

Two courses on mushrooms for School of the Chicago Botanic Garden.

Graduate students advised or committee member:

Rui Zhang (PhD at NU)
Corey Palmer (M.S. at NU)
Nik Desai (M.S. at NU)

Rob Hevey (M.S. at NU)
Aleksandar Radosavljevic (Ph.D. at NU)

J. O'Shaughnessy

Prairie Restoration Management Tour, DePaul University Ecology class, April 29, 2011
Prairie Restoration Management Tour, Greencorps Chicago, May 17, 2011
Prairie Restoration Management Tour, Chicago Botanic Garden and Openlands Ecosystem Studies Summer Institute, June 28, 2011
A Walk in the Woods, School of the Chicago Botanic Garden, September 27, 2011
Prairie Restoration Management Tour, Illinois Golden Apple Teachers, October 27, 2011
Prairie Restoration Management Tour, Illinois Institute of Technology Ecology Class, October 27, 2011
Prairie Restoration Management Tour, Center for Teaching and Learning, Volunteer Teachers, October 24, 2011.
Riparian & Lakeshore Shoreline Stabilization Tour, Glenview Village Natural Resource Committee, November 22, 2011.
High School and College First students mentored
Eliot Larson (Global Citizenship Experience H.S.)
Tommy Dehn (College First)

K. Skogen

Conservation and Land Management Internship Program – Training Workshop. Chicago Botanic Garden. June 26-July 2nd, 2011. 52 interns and 10 instructors attended this week-long workshop.
PBC 451/Biol Sci 355 Fundamentals of Plant Science & Conservation, *Instructor*
Northwestern University, Evanston, IL Winter and Fall 2011 quarters
PBC 450 Field & Laboratory Methods in Plant Biology & Conservation*, Co-Instructor*
Northwestern University, Evanston, IL. Fall 2011
Graduate students advised or committee member
Rebecca Barak (MS at NU) Major Advisor
Emily Booth (MS at NU) Major Advisor
Anna Braum (MS at NU)
Megan Kate Gallagher (MS at NU)
Melissa Gray (MS at NU) Major Advisor
Kelly Ksiazek (MS. and Ph.D. NU) Major Advisor
Matthew Rhodes (MS at NU) Major Advisor
Ricardo Rivera (MS at NU) Major Advisor
Karen Taira (MS at NU)
Byron Tsang (MS at NU)
Mentored Research Assistants
Evan Hilpman
Sadie Todd

D. Sollenberger

College First student advised:
Desei Williamson
Early Summer Prairie Walk; School of the Botanic Garden, June 4, 2011.

Using Native Plants in the Landscape; Windy City Harvest Training Program, Chicago Botanic Garden, September 15, 2011.
Prairie Plant Identification in the Field; School of the Botanic Garden, September 21, 2011.

J. Steffen
Woodland Wildflower Walk; School of the Chicago Botanic Garden, April 30, 2011.
Trees and Woodland Wildflower Walk, Center for Teaching and Learning Volunteer Teachers, May 2, 2011.
Woodland Management Tour, Council of Botanic Librarians, May 18,2011.
Woodland Management Tour, Elder Hostel, May 19, 2011.
Gardening and Seed Collection and Preservation, Teacher Camp Program, Center for Teaching and Learning, May 21, 2011.
Woodland Management Tour, Elder Hostel, May 19, 2011.
Birding Tour, Lake Cook Audubon, September 25, 2011.
Woodland Ecology and Management, Illinois Institute of Technology, October 6, 2011.
Woodland Management Tour, Center for Teaching and Learning, Volunteer Teachers, October 24, 2011.
Woodland Ecology and Management Tour, Illinois Golden Apple Teachers, October 27, 2011.

S. Still
Ecology and Materials Workshop I: Plants and Planning (Fall 2011), lecture on species distribution modeling, Illinois Institute of Technology (D. Larkin, A. Bell).

P. Vitt
Biology and Genetics of Native Plants for Seed Collecting; Windy City Harvest Training Program, Chicago Botanic Garden, September 15, 2011.
Postdoctoral Fellows Advised:
Shannon Still

S. Wagenius
Quantitative Methods in Ecology and Conservation (Winter 2011), Northwestern University
Major advisor for graduate students:
Kate Gallagher (MS, Northwestern University, graduated June 2011)
Christine Dumoulin (MS, Northwestern University, graduated June 2011)
Joshua Drizin (MS, Northwestern University)
Karen Taira (MS, Northwestern University)
Katherine Muller (MS, Northwestern University)
Committee member for graduate students:
Amy Price (MS, Northwestern University)
Melissa Tienes (MS, Northwestern University)
Rebecca Tonietto (PhD, Northwestern University)
Colby Witherup (MS, Northwestern University)
Undergraduate students advised:
Amber Zahler (Lake Forest College)
Emilee Gaulkee (Lake Forest College)
Victoria Jones (Lake Forest College)
Deena Blanchard (Lake Forest College)
Maria Wang (Northwestern University)

Nicholas Goldsmith (Purdue University, IN)
Lee Rodman (Grinnell College, IA)
High School students co-advised:
Nicole Baylon (St Martin De Porres High School)
Jill Meyer (St Martin De Porres High School)
Secondary School Science Teachers Mentored:
Greg Diersen (Great Plains High School, SD)
Callin Switzer (Kennedy Middle School, NM)

N. Wickett
Understanding Evolution from Seaweed to Salad: Northwestern University (Fall, 2011).
Graduate students advised:
Laura Briscoe (MS at NU)

A. Wilson
Graduate student committee member:
Nikhilesh Desai (MS at NU)
Mentoring Graduate Research
Rui Zhang (Ph.D. at NU)
Mentoring Undergraduate Research
Dayani Pieri (Oakton Community College)
Lauren Bailey (Lake Forest College
Interns advised:
Austin Erney (Lake Forest College)

E. Yates
PBC 450 - Field and Laboratory Methods in Plant Biology and Conservation (Fall 2011),
Northwestern University, section on GIS and spatial analysis.
Conservation and Land Management Intern Training Workshop. Chicago Botanic Garden, June 30.
Interns advised:
Rebecca Lehrman (Endicott College)
Octavio Olivera de Araujo (ACI)
College First student advised:
Desei Williamson
Project Assistantships (PAs), Northwestern University, co-supervised:
Ben Morgan (Seed Bank)
Aleksandar Radosaveljevic (GIS Lab)
Becky Tonietto (Seed Bank)

N. Zerega
Spring Flora (PBC 414/BIO 316), spring quarter 2011 at Northwestern University (20 students)
*Plant Morphology Lecture***,** for Master's in Landscape Architecture students at Illinois Institute of Technology, September 2011.
Major advisor for graduate students:
Lindsay Darling (MS, Northwestern University)
Colby Witherup (MS, Northwestern University)
Committee member for graduate students:

Jennifer Alyah (MS, Northwestern University)
Rebecca Barak (MS, Northwestern University)
Laura Briscoe (MS, Northwestern University)
Emily Booth (MS, Northwestern University)
Aleksander Radosavljevic (PhD, Northwestern University)

Undergraduate students advised:

Michelle Glantz (Tulane University)
Uri Magaram (Northwestern University)
Yuri Malina (Northwestern University)
Paya Sharaf (Northwestern University)

High School student advised:

Anna Winter (Evanston Township High School)

PROFESSIONAL SERVICE

J. Ault

Chicagoland Grows®, Inc. Plant Introduction Program

Director and Manager
Liaison to Ornamental Growers Association of N. Illinois (OGA) Board of Directors

L. Egerton-Warburton

Proposal Reviewer

National Science Foundation reviewer for Ecosystems Spring panel
BARD, The United States – Israel Binational Agricultural Research and Development Fund

Research Associate, The University of California, Riverside

Manuscript Reviewer

Plant Ecology
Ecology Letters
New Phytologist
Journal of Ecology
HortScience
Annals of Botany
Global Change Biology
Journal of Experimental Botany
Plant and Soil
European Journal of Soil Science
Functional Ecology
Mycorrhiza
Applied Soil Ecology

J. Fant

Botanical Society of America

Member (2007-present)

Ecological Society of America

Member (2007-present)

DePaul Institutional Biosafety Committee

Committee Member (2009- present)
Manuscript reviewer
American Journal of Botany
Annales Botanici Fennici
Annals of Botany
Applied Vegetation Science
Aquatic Botany
Botanical Bulletin of Academia Sinica
Folia Geobotanica
International Journal of Plant Science
Molecular Ecology
Plant Systematics and Evolution
Preslia
Restoration Ecology
Telopea
Proposal reviewer
National Science Foundation

M. Haidet
Plant Conservation Alliance
SOS contact

K. Havens-Young
American Public Gardens Association
Member of Conservation Committee (1999-present)
Botanical Society of America
Public Policy Committee (2011-present)
Botanic Gardens Conservation International
US Board of Directors (2005-present)
Chicago Wilderness
Member, Global Climate Change Task Force (2007-present)
City of Chicago
Member of Chicago Department of Environment Invasive Species Advisory Group
Center for Plant Conservation
Member of recovery criteria for endangered plants team
Member of ecotype team
Fairchild Tropical Botanical Garden
Research Associate
Illinois Endangered Species Protection Board
Member of Scientific Review Panel (1999-present)
Invasive Plant Council of Illinois
Co-founder (2002-present)
Illinois Native Plant Society
Lifetime Member and Past President
Landscape, Ecological and Anthropogenic Processes (LEAP) Program Committees at University of Illinois Chicago
Admissions Committee
Curriculum Committee

Midewin National Tallgrass Prairie
Member of Scientific Review Panel (1999-present)
Midwest Invasive Plant Network
Board member and Treasurer (2002-present)
Midwestern Rare Plant Task Force
Founder and co-coordinator (1997-present)
North American Botanic Garden Conservation Strategy
Team member.
Plant Conservation Alliance
Cooperator contact
Plant Biology and Conservation (PBC) committees at Northwestern University
PBC Oversight Committee
PBC Admissions Committee
World Conservation Union (IUCN) Species Survival Commission,
Plant Committee, North American Rep. (2005 to 2010)
Conservation Breeding Specialist Group, Intensively Managed Populations (2010-present)
U.S. Fish and Wildlife Service Endangered Species Recovery Team member for Cirsium pitcheri, Platanthera leucophaea
Manuscript reviewer
American Journal of Botany
Biological Conservation
Conservation Biology
Conservation Genetics
Evolution
International Journal of Plant Sciences
New Phytologist
Proposal reviewer
National Science Foundation
External dissertation reviewer
University of Western Australia

R. Hawke
American Public Gardens Association
Member of Plant Collections Section
Member of Plant Nomenclature & Registration Section
Plants in Focus: Perennial Evaluation Committee
Member
Chicagoland Grows®, Inc. Plant Introduction Program
Member, New Plant Committee

P. Herendeen
American Institute of Biological Sciences (AIBS)
AIBS Ad Hoc Committee on Biodiversity-related Sciences
International Association for Plant Taxonomy
Secretary, Nomenclature Committee on Fossil Plants
Delegate at the Nomenclature Section meeting in association with the International Botanical Congress, Melbourne, Australia, July 2011.

Editorial Committee Member to write the new edition of the *International Code of Botanical Nomenclature*.

American Society of Plant Taxonomists

Program Director
Search committee to replace editor of Systematic Botany Monographs
Committee to assess business model for Systematic Botany Monographs

Botanical Society of America

Secretary-Treasurer for Systematics Section of BSA

International Journal of Plant Sciences

Editor

PhytoKeys (new open access journal)

Subject Editor (paleobotany, legume systematics), July 2011 – present

National Science Foundation

Grant proposal ad hoc reviewer

Manuscript Reviewer

American Journal of Botany
Annals of Botany
Grana
International Journal of Plant Sciences
Novon
PLoS One
Systematic Botany

R. Kirschner

Chicago Regional Biodiversity Council (Chicago Wilderness)

Member of Natural Resources Management Team
Member of Aquatics Task Force
Member of Congress Planning Committee
Technical reviewer of nominations and awards ceremony event host for *Conservation and Native Landscaping Awards* program

Chicago Park District

Member of Natural Areas Advisory Committee

City of Chicago

Member of Chicago Department of Environment Aquatic Invasive Species Advisory Group

EcoMyths Chicago

Board Member, Treasurer, Advisory Board Member

Morton Arboretum

Advisor to the Lakes and Ponds chapter for *Sustainable Landscaping Resources for Community Associations* manual

U.S. Environmental Protection Agency

Member of National Advisory Committee on Lake Outreach

D. Larkin

Manuscript reviewer

American Midland Naturalist
Ecological Engineering
Restoration Ecology

Northeastern Illinois Invasive Plant Partnership
Steering Committee member
National Science Foundation panelist
Major Research Instrumentation
Research Experiences for Undergraduates
Plant Biology and Conservation, Northwestern University
PhD Admissions Committee

E. Lonsdorf
Manuscript reviewer
Ecological Applications
Oikos

S. Masi
Illinois Lake Michigan Implementation Plan
Advisory Group member
American Public Garden Association
Member
Chicago Wilderness Natural Resource Management Team
Member
Chicago Wilderness Task Force: Species and Communities of Conservation Concern
Member
Endangered Species Technical Advisory Committee to the IL Endangered Species Protection Board
Member
Illinois Endangered Species Protection Board
Member
Illinois Native Plant Society
Member
Manuscript Reviewer
Erigenia
Natural Areas Association
Member
Participant in Citizen Science Networks
PPSR (Public Participation in Scientific Research – Cornell University), POC presence on website.

G. Mueller
Participated in an external review of Royal Botanic Gardens, Kew's science programs. December, 2011
Chicago Wilderness
Member Executive Council
City of Chicago
Member Mayor's Nature and Wildlife Committee
Chicago Council for Science and Technology
Member of Board, Member of Membership Committee
Illinois Nature Conservancy
Member, Science Advisory Council
Illinois Mycological Association

Scientific Advisor
IUCN Species Survival Commission
Chair, Mushrooms, Brackets, and Pufballs Specialist Group
International Society for the Conservation of Fungi
Charter Member, Coordinating Group, Organized the first elections for officers
Mycological Society of America
Nominations Committee, Honorary Member Committee, Conservation Committee
Latin American Mycological Association
Advisory Committee for next Congress
Manuscript reviewer
Numerous journals as well as pre-reviews for colleagues
Proposal reviewer
National Science Foundation, National Geographic, others

K. Skogen
Botanical Society of America.
Karling and Graduate Student Research Awards. Committee member. 2010 - 2012.
Certifying Botanists Committee. Steering committee member. 2010-Present.
Manuscript reviewer
American Journal of Botany
Oecologia

J. Steffen
OpenLands
Advisor and researcher inventorying birds, litter spiders, and microarthropods.

S. Still
Chicago Wilderness
Member, Global Climate Change Task Force

P. Vitt
Chicago Wilderness
Member, Global Climate Change Task Force (2009-present)
Chicago Climate Action Plan
Adaptation Advisory Committee
U.S. Fish and Wildlife Service Endangered Species Recovery Team member for Lespedeza
leptostachya, Platanthera praeclara
World Conservation Union (IUCN) Species Survival Commission,
Orchid Specialist Group (2005 to 2010)
Manuscript reviewer
American Journal of Botany
Biological Conservation
Conservation Biology
Ecology Letters
Proposal reviewer
National Science Foundation

S. Wagenius

Plant Biology and Conservation (PBC) committees at Northwestern University
PBC Curriculum Committee
PBC PhD Admissions Committee
Manuscript reviewer
Numerous
Proposal reviewer
National Science Foundation

N. Wickett
Botanical Society of America
Member
American Bryological and Lichenological Society
Member
Manuscript Reviewer
American Journal of Botany
Journal of Molecular Evolution
Molecular Biology and Evolution
Molecular Phylogeny and Evolution
Phytotaxa
Systematic Biology
Trends in Plant Science

A. Wilson
Manuscript Reviewer
Mycoscience
New Phytologist
Journal of Biogeography
Mycologia
TAXON
Illinois Mycological Association
President
Mycological Society of America
Judge for student poster presentations
Membership committee
Amateur society liaison
Professional Society Memberships
Botanical Society of America
Mycological Society of America
Society for the Study of Evolution

E. Yates
Association of American Geographers
Member & Annual Meeting presenter, *Topics in Biogeography* section
Illinois GIS Association
Member & conference presenter

COLLABORATIONS

J. Ault
Kris Bachtell (Morton Arboretum), Kunso Kim (Morton Arboretum), Ornamental Growers Association of Northern Illinois (OGA), Wisconsin-Illinois Lily Society, 30-plus nurseries evaluating/growing breeding program plants, 100-plus nurseries evaluating/growing other *Chicagoland Grows*® plant introductions (woody plants).

L. Egerton-Warburton
Edith B. Allen (University of California, Riverside), Michael F. Allen (University of California, Riverside), Hormoz BassiriRad (University of Illinois Chicago), Kingsley Dixon (Kings Park and Botanic Garden, Australia), Arturo Gomez-Pompa (University of California, Riverside), Robert C. Graham (University of California, Riverside), Andrew Jacobson (Northwestern University), Nancy C. Johnson (Northern Arizona University), Ari Jumponnen (Kansas State University), José Ignacio Querejeta (CEBAS-CSIC, Spain), Harbans Sehtiya (Hariyana Agricultural University, India), Rodrigo Vargas (University of California, Berkeley), Patricia Beddows (Northwestern University), Neal Blair (Northwestern University), Yun Wang (Northwestern University).

J. Fant
Mary Ashley (University of Illinois Chicago), Alona Banai (Loyola University), Tim Bell (Chicago State University), Justin Borevitz (University of Chicago), Marlin Bowles (Morton Arboretum), Diane Byers (Illinois State University) Julie Etterson (University of Minnesota, Duluth), Alden Griffith (Wellesley College), Chrystal Ho Pao (Trinity International Univ.), Andrea Kramer (BGCI), Tiffany Knight (Washington University, St Louis), Joyce Maschinski (Fairchild Tropical Botanic Garden), Geoff Morris (University of Chicago), Christopher Preston (Centre of Ecology and Hydrology, UK).

M. Haidet
Bill Brumback (New England Wildflower Society, Framingham, MA), Mike Cashman (Agricultural Research Service, Pullman, WA), David Ellis (Agricultural Research Service, Ft. Collins, CO), Brian Endress (Zoological Society of San Diego), Minnette Marr (Lady Bird Johnson Wildflower Center, Austin, TX), Ray Mims (US Botanic Garden, Washington, DC), Peggy Olwell (Bureau of Land Management, Washington, DC), Johnny Randall (North Carolina Botanical Garden, Chapel Hill, NC), Nita Rauch (US Forest Service, Bend, OR), Rusty Russell (Smithsonian Institution), Ed Toth (NYC Department of Parks and Recreation, New York, NY).

K. Havens-Young
Amy Ando (University of Illinois Urbana-Champaign), Mary Ashley (University of Illinois Chicago), Tim Bell (Chicago State University), Justin Borevitz (University of Chicago), Marlin Bowles (Morton Arb., Lisle, IL), Bill Brumback (New England Wildflower Society, Framingham, MA), Kingsley Dixon (Kings Park & Botanic Garden, Perth, AUS), Patricia DeAngelis (U.S. Fish and Wildlife Service, Arlington, VA), Christopher Dunn (Lyon Arboretum, Honolulu, HI), Tony Endress (University of Illinois Urbana Champaign), Don Falk (University of Arizona, Tucson, AZ), Elizabeth Farnsworth (New England Wildflower Society, Framingham, MA), Ed Guerrant (Portland State University, Portland, OR), Sandra Henderson, (NEON, Boulder, CO), Kent Holsinger (University of Connecticut, Storrs, CT), Kristina Hufford (University of Wyoming, WY), Claudia Jolls (East Carolina University,

NC), Lara Jefferson (Maunsell Environmental, Perth AUS), Jeff Karron (University of WI Milwaukee), Tom Kaye (Institute for Applied Ecology, OR), Bruce Kendall (University of California Santa Barbara), Kathryn Kennedy (Center for Plant Conservation, St. Louis, MO), Tiffany Knight (Washington University , St. Louis, MO), Andrea Kramer (BGCI, Chicago and Sydney AUS), Mike Maunder (Al Ain Wildlife Park, Abu Dhabi, UAE), Kathryn McEachern (US Geological Survey, CA), Eric Menges (Archbold Biol. Station, Lake Wales, FL), Rachel Muir (US Geological Survey, Ft. Collins, CO), Sara Oldfield (BGCI, London, UK), Peggy Olwell (Bureau of Land Management, Washington DC), Barron Orr (University of Arizona, Tucson, AZ), Noel Pavlovik (US Geological Survey, IN), Marcello Pennacchio (Perth AUS), Kristina Schierenbeck (California State University, Chico, CA), Larry Stritch (US Forest Service, Washington DC), Marshall Sundberg (Emporia State University, KS), Jeff Walck (Middle Tennessee State University, TN).

R. Hawke
Allen Bush (Jelitto Perennial Seeds, Germany), Jack De Vroomen (De Vroomen Plants, Holland), Evan Elenbaas (Walters Gardens, Zeeland, MI), Raymond Evison (Guernsey Clematis Nursery Ltd, England), Dan Heims (Terra Nova Nurseries, Portland, OR), Chris Kelleher (Blooms of Bressingham, England), Michael Marriott (David Austin Roses, England), Jim Nau (Ball Horticultural, North Chicago, IL), Angela Treadwell Palmer (Plants Nouveau, Baltimore, MD), Mary Walters and Chris Hansen (Great Garden Plants, Michigan), Dr. Mark Widrlechner (USDA North Central Plant Introduction Station, Ames, IA), Nicholas Staddon (Monrovia Growers, Azusa, CA), Steve Castorani (North Creek Nurseries, Landenberg, PA), Kerry Meyers (Proven Winners, St. Thomas, MO).

P. Herendeen
Anne Bruneau (University of Montreal), Peter Crane (Yale University), Else Marie Friis (Swedish Museum of Natural History), Vicki Funk (Smithsonian Institution) , Bente Klitgaard (Royal Botanic Gardens, Kew), John Kress (Smithsonian Institution), Matthew Lavin (Montana State University), Gwilym Lewis (Royal Botanic Gardens, Kew), Melissa Luckow (Cornell University), Richard Lupia (University of Oklahoma), Susana Magallon (Universidad Nacional Autónoma de México), Steven Manchester (University of Florida), Lucinda McDade (Rancho Santa Ana Botanic Garden), Toby Pennington (Royal Botanic Garden Edinburgh), Karen Redden (Smithsonian Institution), Michael Sanderson (Arizona State University), Petra Sierwald (Field Museum), Doug Soltis (University of Florida), Pam Soltis (University of Florida), David Spooner (USDA, Madison, WI), Masamichi Takahashi (Niigata University, Japan), Scott Wing (Smithsonian Institution), Martin Wojciechowski (Arizona State University).

S. Jacobi
Cami Dixon (USFWS), Patricia Heglund (USFWS), Benjamin Hobbs (Johns Hopkins University),Tim Jones (USFWS), Jill Gannon (USGS), James Lyons (USFWS), Clint Moore (USGS), Carrie Reinhardt-Adams (University of Florida), Terry Shaffer (USGS), Wayne Thogmartin (USGS), Peter Wilcock (Johns Hopkins University).

R. Kirschner

Patrick Goggin (University of Wisconsin Stevens Point - Extension), Jennifer Nalbone (Great Lakes United), Adrianna Muir (University of California, Davis), Patrice Charlebois (Illinois-Indiana Sea Grant Program).

D. Larkin
Marlin Bowles (Morton Arboretum), Ryan Brady (Wisconsin Dept. of Natural Resources), Pamela Geddes (Northeastern Illinois University), Liam Heneghan (DePaul University), Andrew Hipp (Morton Arboretum), Kevin Kuehn (University of Southern Mississippi), Shane Lishawa (Loyola University Chicago), Debbie Maurer (Lake Co. Forest Preserve District), Andy Paulios (Wisconsin DNR), David Rogers (University of Wisconsin-Parkside), Anita Thompson (UW-Madison), Nancy Tuchman (Loyola), Joy Zedler (UW-Madison).

E. Lonsdorf
Norbert Cordeiro (Roosevelt University), Jane Goodall, Patricia Heglund (USFWS), Tim Jones (USFWS), Claire Kremen (U. California-Berkeley), Josh Lawler (U. Washington), David Lewis (U. of Puget Sound), Elizabeth Lonsdorf (Lincoln Park Zoo), Socheata Lor (USWFWS), James Lyons (USFWS), Clint Moore (USGS), Erik Nelson (Bowdoin College), Maile Neel (University of Maryland), Andrew Plantinga (Oregon State U.), Steve Polasky (U. of Minnesota), Anne Pusey (Duke University), Volker Radeloff (U. Wisconsin), Carrie Reinhardt-Adams (University of Florida), Taylor Ricketts (University of Vermont), Wayne Thogmartin (USGS), Dominic Travis (U. Minnesota), Denis White, Neal Williams (U. California-Davis).

S. Masi
Lori Artiomow (Chiwaukee Prairie Preservation Society), Linda Masters, Openlands, Chris Mulvaney (Chicago Wilderness), Melinda Pruitt Jones (Chicago Wilderness), Greg Spyreas (Illinois Natural History Survey), Mike Ward (Illinois Natural History Survey); The Habitat Project, Audubon-Chicago Region; Susie Schreiber (Waukegan Harbor Citizens Advisory Group), 65 landowner-partners of Plants of Concern, from federal, state, and local public agencies and private landowners.

G. Mueller
Jerry Adelmann (Openlands, Chicago), Cathie Aime (LSU), Martyn Ainsworth (Royal Botanic Gardens, Kew), Eef Arnalds (Emeritis Director of the Biological Station Wijster, The Netherlands), Peter Avis (Indiana University Northwest, Gary, IN), Hormoz Bassir Rad (U. Illinois at Chicago), Justin Borevitz (University of Chicago), Mayra Camino, (University of Havana, Cuba), Paul Cannon (CABI and Royal Botanic Gardens, Kew), Julieta Carranza (U. Costa Rica), Priscila Chaverri (University of Maryland), Michael Coates (University of Chicago), Anders Dahlberg (Swedish Species Information Centre, Upsala, Sweden), Cvetomir Denchev (Institute of Botany, Bulgarian Academy of Sciences, Bulgaria), Aaron Durnbach (Department of the Environment, City of Chicago), Ana Esperanza Franco (University of Antiochia, Medellin, Colombia), Roy Halling (New York Botanical Garden), Tsutomu Hattori (Forestry and Forest Products Research Institute, Japan), Terry Henkel (Humboldt State, California), Kentaro Hosaka (National Museum of Nature and. Science, Japan), Reda Irsenaite (Vilnius University, Lithuania), Carolyn Johnson (University of Chicago), Matthew Keirle (State College of Florida), Heikki Kotiranta (Finnish Environment Institute, Finland), Andrea Kramer (BGCI, Chicago and Sydney AUS), Patrick Leacock (Field Museum), Thorsten Lumbsch (Field Museum), Milagro Mata (INBio, Costa Rica), T.

W. May (Royal Botanic Gardens, Melbourne), Joe McFarland (IDNR), David Minter (CABI, UK), Randy Molina (US Forest Service, Corvallis, retired), Sara Oldfield (BGCI, London, UK), Claudia Perini (University of Siena, Italy), Ron Petersen (U, Tennessee, Knoxville), Melinda Pruett-Jones (Chicago Wilderness), Laurel Ross (Field Museum), Christoph Scheidegger (Swiss Federal Research Institute for Forest, Snow and Landscape, Switzerland), Walter Sundberg (Southern Illinois University, Carbondale), Tatyana Svetasheva (Tula State University, Tula, Russia), Gavin van Horn (Center for Humans and Nature), Zhu-Liang Yang (Kunming Institute of Botany, China), Zhanna Yermakov (Chicago Park District).

K. Skogen
Tia Adams (US Fish and Wildlife Service), Nancy Brian (National Park Service), Zoe Cardon (Marine Biological Lab, Woods Hole), Shane Heschel (Colorado College), Kent Holsinger (University of Connecticut, Storrs), Diane Ikeda (Forest Service, CA), Sylvia Kelso (Colorado College), Andrea Kramer (BGCI, Chicago and Sydney AUS), Peggy Olwell (Bureau of Land Management), Robert Raguso (Cornell University).

P. Vitt
Amy Ando (University of Illinois), Tim Bell (Chicago State University), Todd Bittner (Cornell Plantations), Marlin Bowles (Morton Arboretum), Kingsley Dixon (Kings Park & Botanic Garden, AUS), Tony Endress (University of Illinois), Ed Guerrant (Berry Botanic Garden), Marion Harris (North Dakota State University), Kent Holsinger (University of Connecticut), Bruce Kendall (University of California Santa Barbara), Kathryn Kennedy (Center for Plant Conservation), Bill Kleiman (TNC), Tiffany Knight (Washington University), Mike Maunder (Fairchild Tropical Garden), Eric Menges (Archbold Biol. Station), Peggy Olwell (Bureau of Land Management), Barron Orr (University of Arizona), Nancy Sather (Minnesota DNR), Kathryn Theiss (University of Connecticut), Arthur Weiss (University of Toronto).

S. Wagenius
Eric Lonsdorf (CBG), Gretel Kiefer (TNC), Kevin Kotts (Minnesota DNR), Mary Ashley (University of Illinois Chicago), Ruth Shaw (University of Minnesota), Charlie Geyer (University of Minnesota), Caroline Ridley (US EPA), Andy McCall (Denison University), Steph Lyon (University of Wisconsin – Madison.

N. Wickett
Michael Barker (University of Arizone), Gordon Burleigh (University of Florida), Cymon Cox (University of Algarve, Portugal), Claude dePamphilis (Penn State), Bernard Goffinet (University of Connecticut), Gane Ka-Shu Wong (University of Alberta),Jim Leebens-Mack (University of Georgia), Chris Pires (University of Missouri), Doug Soltis (University of Florida), Pam Soltis (Florida Museum of Natural History), Michael Timko (University of Virginia), Jim Westwood (Virginia Tech), John Yoder (University of California, Davis).

A. Wilson
Catherine Aime (Louisiana State University), Manfred Binder (Clark University), Dennis Desjardin (San Francisco State University), Terry Henkel (Humboldt State University), David Hibbett (Clark University), Erik Hobbie (University of New Hampshire), Brandon Matheny (University of Tennessee), Larissa Trierveiler Pereira (Universidade Federal do Rio

Grande do Sul, Brasil), Brian Perry (University of Hawaii at Hilo), Jun Wen (Smithsonian Institution).

E. Yates
Mary Byrne Rager (Bioloque), Andrew Clark (US National Herbarium, Smithsonian), Thomas Croat (Missouri Botanical Garden), Carol Davit (Missouri Prairie Foundation), Diane Donovan (Shaw Nature Reserve, St. Louis, MO), Dave Ellis (National Center for Genetic Resources Preservation, CO), Megan Haidet (Seeds of Success, Bureau of Land Management), Jesse Kieft (CartoPac Field Solutions), Cheiko Maene (GIS Collaborative, University of Chicago), Jason McNees (Conservation Data Analyst, Nature Serve), Kelly Neil (IL Nature Preserves Commission), Andrew Robb (Seiler Instruments, Inc.), Karen Tharp (Illinois Volunteer Stewards Network), Emma York (Herbarium, Royal Botanic Gardens, Kew), Phil Young (Advanced Geospatial Laboratory, Northern IL University), 20 seed collection permitting agencies: federal, state, local, and private landowners, ten contract seed collectors across nine states.

N. Zerega
Leslie Chung (Hope Gardens, Jamaica), Wendy Clement (Yale University), Jeremie Fant (CBG), Salma Hossain (University of Rajshahi, Bangladesh), Brian Irish (USDA) Ruby Khan (University of Rajshahi, Bangladesh), Tracy Misiewicz (University of California, Berkeley), Michael Pillay (Vaal University of Technology, South Africa), Timothy Motley (Old Dominion University, Roanoke, VA), Diane Ragone (National Tropical Botanical Garden, HI), Nina Ronsted (University of Copenhagen, Denmark), Brian Scheffler (USDA) Nur Supardi (Forest Research Institute of Malaysia), Norman Wickett (CBG), Colby Witherup (Northwestern University), M. Iqbal Zuberi (University of Rajshahi, Bangladesh).

Appendix 1: Seed Bank and Plants of Concern Partnerships

Persons/Institutions Using Seeds From the Dixon National Tallgrass Prairie Seed Bank:

Prof. Djaja Djendoel Soejarto, University of Illinois at Chicago, chaff from 219 species in 2011.

National Center for Genetic Resources Preservation, USDA, Ft. Collins, CO – 218 accessions

Native Seed Farm Project, Chicago Botanic Garden, 6 accessions.

Plants of Concern Landowner and Agency Partners

Boone Creek Watershed Alliance
Cary Park District
CD McHenry County
Chicago Park District
Chicago Wilderness
City of Elgin
City of Lake Forest
City of Waukegan
Commonwealth Edison
Dale Shriver
Deerfield Associates
Downer's Grove Park District
Dundee Township
FPD Cook County
FPD DuPage County
FPD Kane County
FPD Kendall County
FPD Lake County
FPD Will County
Glen Speigler
Glenview Park District
Heidi and Dan Natura
Highland Park/Park District
Illinois DNR
Illinois DOT
IL Endangered Species Protection Board
IL Toll Highway Authority
IL Natural Heritage Database
IL Nature Preserves Commission
IN Department of Natural Resources
Jerry Kolar
John Clemetsen
Joliet Park District
Keenan Family
Lakowski Family
Libertyville Township
Lockport Township Park District/FPD Will County

Lorna Gladstone
Marsh Family
Marty Papanek
Masi/D'Alessandro Family
MWRD
Natural Land Institute
Nelsons
Nicole Williams/Larry Becker
North Shore School District 112
Northeastern Illinois University
Northwestern University
Oak Lawn Park District
Oakton Community College
Openlands
Palatine Park District
Plainfield Park District
Privately Owned Properties (4)
Rendl Family
Rodney & Libby Aavang
Shaw Family
Shirley Heinze Foundation
St. Charles Park District
The Nature Conservancy
Tom Burroughs
US Forest Service (at Midewin National Tallgrass Prairie)
US Department of Energy (at Fermilab)
US Department of Interior (at Indiana Dunes National Lakeshore)
Village of Lake in the Hills
Village of Lincolnshire
Village of Long Grove
Village of Oakwood Hills
Wisconsin DNR
Wilmette Park District
Zion Park District

Appendix 2: Schematic of Science and Conservation Programs