**Simpson College**

**Research, Scholarship and Creativity Fund**

**2013-2014**

**Submitted by: Clinton Meyer, Biology & Environmental Science**

**Phone: 961-1822, email: clinton.meyer@simpson.edu**

**1. Title of proposed project:** Terrestrial Invertebrate Response to Planted Seed Diversity in Prairie Restoration

**2. Description of project for which funding is being sought:**

**a) Purpose:**

Tallgrass prairie is one of the most degraded and threatened ecosystems in the US. In the agricultural Midwest, the vast majority of native tallgrass prairie area has been converted to row-crop agriculture (Samson and Knopf 1994). Although the ecological value of prairies has been well-studied (Weaver 1954, 1968, Risser et al. 1981, Samson and Knopf 1996 and references therein), recent evidence confirms the value of prairies and suggests that their economic value (Costanza et al. 1997, Dodds et al. 2008) makes them important foci for restoration efforts.

Restoration ecology, the branch of biology dedicated to increasing recovery of these imperiled habitats, is a relatively new field. Thus, there is incredible potential for answering basic and applied questions related to recovery. In particular, this project would focus on responses of invertebrates to restoration processes, specifically the reestablishment of native vegetation. Restoration efforts typically involve removing the disturbance (in this case, ceasing farming of sites), followed by introduction of seeds from locally-collected natural vegetation. Land stewards must decide which and how many plant species to introduce into restorations. Because seed collection, processing, and planting is time, labor, and money-intensive, restoration practitioners are interested in finding minimum thresholds for diversity that result in functional restorations. In other words, could seeding with a relatively low diversity of seeds still result in a prairie that is utilized as habitat by a high diversity of consumers such as birds and insects?

The Nature Conservancy of Nebraska has been involved in restoration of wet meadow prairie habitats in south-central Nebraska for over 15 years. They and other conservation organizations (Plains Prairie Resource Institute, Platte River Trust) are pioneers in the

development of restoration practices in the Great Plains (see Steinauer 2003). In addition to several large-scale projects, they have established a research experiment in which replicate plots along a gradient of seed diversity (monoculture, low diversity, high diversity) have been established; the plots are designed to answer questions related to responses of other groups of organisms as well as soil and nutrient status. In particular, the objective of this study is to assess whether differences in plant diversity affect richness and diversity of ground-dwelling invertebrates. The project would include a combination of plant richness and diversity sampling and pitfall trapping for invertebrates within the established plots. The hypothesis is that invertebrate richness is highly correlated to plant richness, and plots with higher plant richness will have correspondingly high invertebrate richness.

**b) Feasibility:**

I have extensive research experience in both restoration and insect ecology (see attached CV). I hold a Master's degree in Entomology from Kansas State University and a PhD in Zoology from Southern Illinois University Carbondale (SIUC). Following graduate school, I completed a one-year post-doctoral experience examining recovery following prairie restoration in the Department of Plant Biology at SIUC. My graduate and post-doctoral work has resulted in 9 publications in peer-reviewed scientific journals. Since that time, I have been involved in many research projects involving undergraduates related to invertebrate and/or restoration ecology. Additionally, I have been working with colleagues in the Platte River region of south central Nebraska for over a decade. My dissertation research focused on the region, and I am involved in several projects related to wetland and prairie restoration practices to track recovery of invertebrates. In fact, the proposed research project was designed in consultation with the Program Director of The Nature Conservancy's Eastern Projects Office, Chris Helzer. Therefore, I am confident the results of this work are of great interest to Mr. Helzer and other restoration practitioners in the region.

**3. Project Design and Justification.**

The project will make use of plots that have been established by The Nature Conservancy of Nebraska (Hall County) to investigate responses to restoration based on differences in planted seed diversity. Replicated 60 x 60m plots were established in 2010. The design includes

replicates of the following 3 plant diversity types: monoculture, which was seeded with 100% big bluestem (*Andropogon gerardii*); low diversity, which was seeded with a low diversity mix of grasses and herbaceous plants; and high diversity, which was seeded with a high diversity mix of grasses and herbaceous plants (see Figure 1).

Sampling will focus on two major components of recovery. Firstly, plant richness and diversity will be measured at 9-12 locations in each of the twelve plots using a $0.25m^2$ quadrat. All plant species found within the quadrat will be identified to species (Christiansen and Muller 1999, Stubbendieck 2003, Runkel and Roosa 2009), and aerial cover of each will be estimated to calculate plant species richness and diversity. This is important because it is not only the focus of the restoration methods, but also because the hope is that consumer groups (birds, invertebrates, mammals, etc.) will respond positively to restored plant communities. Secondly, ground-dwelling invertebrates will be measured by installing a series of pitfall traps (8 dram vials) within each plot. Pitfall traps are part of a passive sampling technique that makes use of invertebrate behavior and gravity such that invertebrates walking over a trap fall in and are collected. I am proposing to install 9-12 pitfall traps in each of 12 plots. The traps will be left in place for ~48 hours. The sampling would be done early (first week of June) and late (first week of August) during the season to account for temporal variability. Major groups of invertebrates will be separated and identified to genus (Arnett and Thomas 2000, Arnett et al. 2002, Fisher and Cover 2007) to estimate richness and diversity. A plant identification quadrat will be centered over each pitfall trap so that I can test for correlations between plant richness and species composition and invertebrate richness and composition.

This project was initially implemented during summer 2012 and was funded by the Bryan Summer Research Program in Mathematics. I worked with Heidi Berger, 3 math students, and 1 biology student to begin addressing this research question in an interdisciplinary way. We used field sampling to estimate plant and invertebrate richness in the plots. The students applied mathematical modeling to the data to investigate relationships between plants and inverts, as influenced by additional environmental variables. We were surprised to find that during 2012, although plant richness did indeed differ by planting treatment, there was no corresponding difference in invertebrate richness (Table 1). If this is true, it might suggest that ground-dwelling invertebrates are particularly resilient to agricultural disturbance, or perhaps more likely that richness of invertebrates is limited by factors in addition to plant richness. Also it is worth

noting that during 2012, south-central Nebraska experienced severe drought conditions. It is impossible to separate drought impacts from recovery patterns related to plant communities. Thus, adding another year of field data would help to further discern patterns of recovery in invertebrates, as well as help us measure inter-annual variability in richness. An additional factor to consider is that the plots are fairly young (established in 2010), so measuring biotic responses early in the recovery process would contribute valuable information to practitioners. The continuation of the data collection would be beneficial to land managers practicing restoration in the Platte region and beyond. Also, it would help Dr. Berger and I to continue building on a successful inter-disciplinary approach to research. Having another year of data would allow us to further fine-tune our mathematical model to assess the impact of plant diversity on ground-dwelling invertebrates in restored prairies in the central Platte River region.

**4. Budget for the project:** I am requesting funding for travel and salary. Funding would pay for 2 trips to field sites (using Environmental Science Truck; only gas reimbursement is requested). Additionally, the funding would pay for two students to work on processing samples and identifying invertebrates in samples during the fall semester. Finally, I am requesting salary for my time devoted to field sampling, invertebrate identification, and the mentoring of students. See attached form for details.

**5. Please indicate whether, if your proposal is funded, we may share your proposal with others:**

If the project is funded, you have my permission to share in part or in total any portion of this document.

**Literature Cited**


Arnett, R. H., Jr. and M. C. Thomas. 2000. American Beetles, Volume I: Archostemata, Myxophaga, Adephaga, Polyphaga: Staphyliniformia. CRC Press.

Arnett, R. H., Jr., M. C. Thomas, P. E. Skelley, and J. H. Frank (editors). 2002. American Beetles, Volume II: Polyphaga: Scarabaeoidea through Curculionoidea. CRC Press.

Christiansen, P. and M. Muller. 1999. An illustrated guide to Iowa prairie plants. University of Iowa Press.

Costanza, R., R. d'Arge, R. deGroot,, S. Farber, M. Grasso, B. Hannon, S. Naeem, K. Limburg, J. Paruelo, R. V. O'Neill, R. Raskin, P. Sutton, V. van den Belt. 1997. The value of the world's ecosystem services and natural capital. Nature 387:253–260.

Dodds, W. K., K. C. Wilson, R. L. Rehmeier, G. L. Knight, S. Wiggam, J. A. Falke, H. J. Dalgleish, and K. N. Bertrand. 2008. Comparing ecosystem goods and services provided by restored and native lands. BioScience 58:837-845.

Fisher, B. L. and S. P. Cover. 2007. Ants of North America: A Guide to the Genera. University of California Press.

Helzer, C. 2010. The Ecology and Management of Prairies in the Central United States University of Iowa Press.

Risser, P. G., C. E. Birney, H. D. Blocker, S. W. May, W. J. Parton, and J. A. Wiens. 1981. The true prairie ecosystem. US/IBP Synthesis Series 16. Hutching Ross Publishing, Stroudsburg, Pennsylvania.

Runkel, S. T. and D. M. Roosa. 2009. Wildflowers of the tallgrass prairie: the upper Midwest. University of Iowa Press.

Samson, F. B. and F. L. Knopf. 1994. Prairie conservation in North America. BioScience 44:418-421.

Samson, F.B., and F.L. Knopf (Editors), 1996, Prairie conservation: preserrving North Aerica's most endangered ecosystem, Island Press, Washington, D.C.

Steinauer, G., B. Whitney, K. Adams, M. Bullerman, and C. Helzer. 2003. A guide to prairie and wetland restoration in eastern Nebraska. Publication of Prairie Plains Resource Institute and Nebraska Game and Parks, Aurora, Nebraska.

Stubbendieck, J. L. 2003. Weeds of the Great Plains. Nebraska Department of Agriculture.

Weaver, J. E. 1954. North American prairie. Johnsen Pulishing, Lincoln, Nebraska.

Weaver, J. E. 1968. Prairie plants and their environment. University of Nebraska Press, Lincoln, Nebraska.

Table 1. Average richness of plants and invertebrates, collected during summer 2012 at The Nature Conservancy Plots (Hall County, Nebraska). Data show averages from each of 4 plots per treatment and overall averages for each of the following three treatments: Mono plots= monoculture, LD= low diversity mix of grasses and forbs, and HD= high diversity mix of grasses and forbs. Initial data suggest that although plant richness is significantly different by treatment, invertebrates did not differ by treatment.

| Plant Richness | | | Invertebrate Richness | | |
|---|---|---|---|---|---|
| Mono | LD | HD | Mono | LD | HD |
| 4.56 | 4.56 | 8.22 | 6.22 | 9.56 | 8.44 |
| 3.44 | 5.56 | 7.11 | 7.89 | 6.56 | 7.89 |
| 5.22 | 4.78 | 7.56 | 8.89 | 9.56 | 10.78 |
| 4.78 | 5.33 | 6.11 | 7.78 | 6.11 | 9.22 |
| Ave: | | | | | |
| 4.50 | 5.06 | 7.25 | 7.69 | 7.94 | 9.08 |

Significantly different (F=16.1, P=0.001)

Not significantly different (F=1.05, P=0.39)

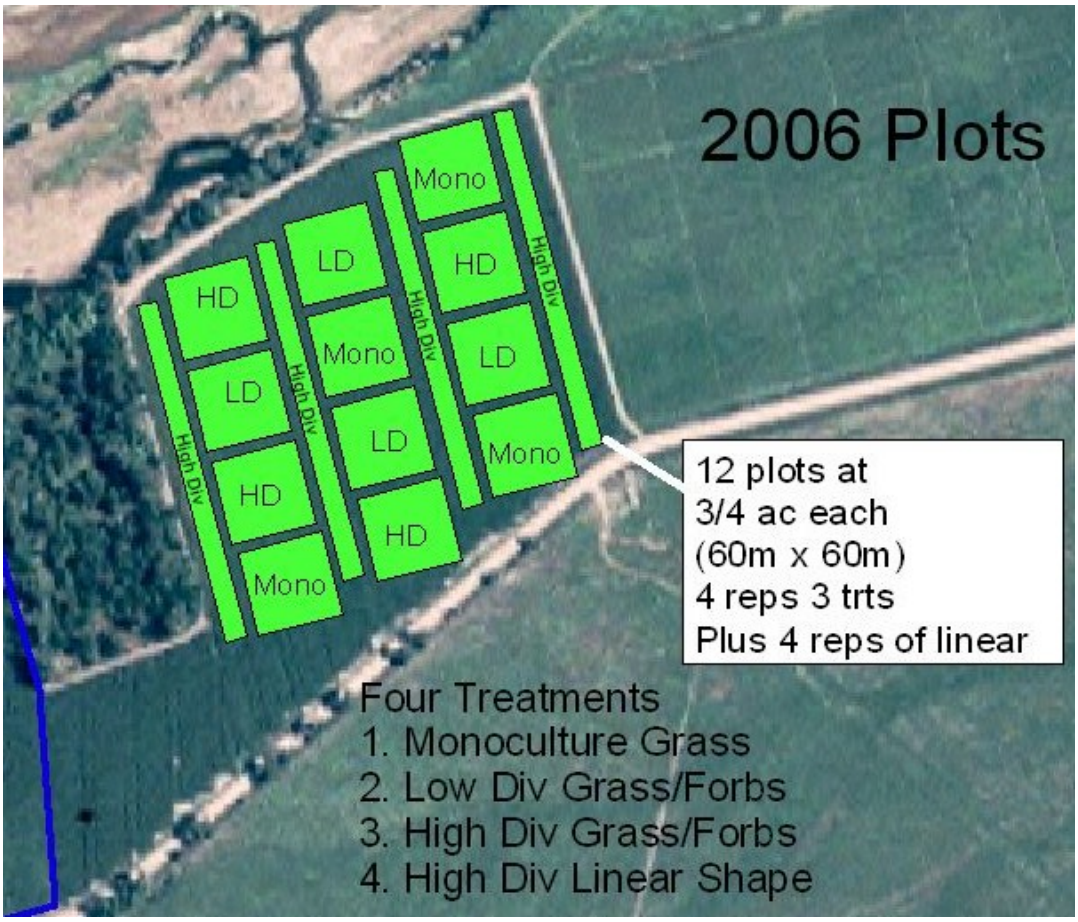


Figure 1. Aerial photograph of research plots established by the Nature Conservancy of Nebraska in Hall County. Proposed sampling would take place in the twelve 60 x 60m research plots which include 4 replicates each of the following treatments: Mono plots= monoculture, LD= low diversity mix of grasses and forbs, and HD= high diversity mix of grasses and forbs.

**Budget Proposal Form**
**Research, Scholarship, and Creativity Grant**
**2013-2014**

| ITEM | | AMOUNT |
|---|---|---|
| **Equipment** | | **$** |
| **1:** | **Cost:** | |
| **2:** | **Cost:** | |
| **3:** | **Cost:** | |
| | | |
| **Materials** | | **$** |
| **1:** | **Cost:** | |
| **2:** | **Cost:** | |
| **3:** | **Cost:** | |
| | | |
| **Personnel** | | **$ 714** |
| **1. Student worker 1** | | |
| **2. Student worker 2** | | |
| **14 weeks in Fall semester, 3 hrs each @ $8.50/hour= $714** | | |
| **Travel Costs** | | **$584** |
| **Airfare:** | | |
| **Mileage: Number of miles _____ @ .565/mile** | | |
| **600 miles each way, 2 trips = 2400 miles. 15 mpg with Environmental Science truck = 160 gallons @ $3.65/gallon= $584** | | |
| **Lodging** | | **$** |
| **Number of days _____ @ $ _____/day** | | |
| | | |
| **Other Expenses** | | **$** |
| **1:** | **Cost:** | |
| **2:** | **Cost:** | |
| **3:** | **Cost:** | |
| | | |
| **Taxable Faculty Stipend**<br><br>**($500 professor; $600 associate professor; $700 instructor/ assistant professor)** | | **$ 700** |
| | | |

| | |
|---|---|
| **TOTAL EXPENSES**<br>**(incurred between 6-1-10 and 5-31-11)** | **$** |
| | |
| **AMOUNT REQUESTED**<br>**(Not to exceed $2000 including stipend commensurate with rank)** | **$ 1998** |

# CLINTON K. MEYER

**Simpson College, Department of Biology & Environmental Science**
**701 North C Street, Indianola, Iowa 50125**
**Phone: 515-961-1822, Email: clinton.meyer@simpson.edu**


## EDUCATION

**Ph.D. 2007** **Zoology, Southern Illinois University Carbondale**, Carbondale, IL. *Ecosystem structure and function in restored and natural slough wetlands: evaluation of restoration practices in the central Platte River valley*

**M.S. 2000** **Entomology, Kansas State University**, Manhattan, KS. *Life history and secondary production of grasshoppers (Orthoptera: Acrididae) in a Kansas tallgrass prairie*

**B.S. 1997** **Biology, Wayne State College**, Wayne, NE.

## EMPLOYMENT HISTORY

**2008-present** **Assistant Professor**
Biology & Environmental Science, Simpson College

**2007-2008** **Andrew Mellon Foundation Post-Doctoral Fellow**
Plant Biology, Southern Illinois University Carbondale, Mentor: Sara G. Baer
*Plant and environmental drivers of $C_4$ grassland development*

**2002-2007** **Graduate Teaching and Research Assistant**
Zoology, Southern Illinois University Carbondale, Advisor: Matt Whiles

**2000-2002** **Research Technologist I**
Department of Agronomy and Horticulture, University of Nebraska Lincoln

**1998-2000** **Graduate Research Assistant**
Entomology, Kansas State University, Advisors: Matt Whiles, Ralph Charlton

## RESEARCH INTERESTS

The focus of my research is primarily on the effects of anthropogenic disturbance on insects, plants, and soil properties and subsequent recovery following restoration. I am most interested in restoration of wetland and prairie systems in the Great Plains.

## REFEREED PUBLICATIONS


**Meyer, C. K.**, S. D. Peterson, and M. R. Whiles. 2011. Efficiency comparisons of active macroinvertebrate sampling techniques in Platte River wetlands. Wetlands 31:101-112.

Bach, E. M., S. G., Baer, **C. K. Meyer**, and J. Six. 2010. Soil microbial and structural recovery during grassland restoration on contrasting soil texture. Soil Biology & Biochemistry 42:2182-2191.

Baer, S. G., **C. K. Meyer**, E. M. Back, R. P. Klopf, and J. Six. 2010. Contrasting ecosystem recovery on two soil textures: implications for carbon mitigation and grassland conservation. Ecosphere 1:1-22.

**Meyer, C. K**., M. R. Whiles, and S. G. Baer. 2010. Plant community recovery following restoration in temporally variable riparian wetlands. Restoration Ecology 18:52-64.

**Meyer, C. K.**, S. G. Baer, and M. R. Whiles. 2008. Ecosystem recovery across a chronosequence of restored prairie slough wetlands in the Platte River valley. ECOSYSTEMS 11:193-208.

**Meyer, C. K.** and M. R. Whiles. 2008. Macroinvertebrate communities in restored and natural Platte River slough wetlands. Journal of the North American Benthological Society 27:626-639.

**Meyer, C.K**., M.R. Whiles, and R.E. Charlton. 2002. Life history, secondary production, and ecosystem significance of acridid grasshoppers in annually burned and unburned tallgrass prairie. American Entomologist 48:52-61

Whiles, M.R., M.A. Callaham, Jr., **C.K. Meyer,** B.L. Brock, and R.E. Charlton. 2001. Emergence of periodical cicadas from a Kansas riparian forest: densities, biomass, and nitrogen flux. American Midland Naturalist 145:176-187

Callaham, M. A. Jr., M. R. Whiles, **C. K. Meyer**, B. L. Brock, and R. E. Charlton. 2000. Feeding ecology and emergence production of annually emerging cicadas (Homoptera: Cicadidae) in tallgrass prairie. Oecologia 123:535-542

## MANUSCRIPTS IN PREPARATION

Henrich*, S., J. Jessee*, B. Mikels*, J. Mullen*, H. Berger, **C. Meyer**, and D. Beresford. Application of time scales calculus to the growth and development in populations of *Stomoxys calcitrans*. We plan to submit to International Journal of Difference Equations, fall 2012.

Thomas*, K., L. Collins*, H. Berger, and **C. Meyer**. An emerald ash borer population model on time scales. We plan to submit to the Journal of Differential Equations, spring 2012.

## SUCCESSFUL FUNDING

### External funding

**Meyer, C. K.** 2011-2012. Effects of tile drainage on macroinvertebrates in Iowa headwater streams. Iowa Science Foundation Grant. Amount: $4690

Berger, H. A. and **C. K. Meyer**. 2010-2011. Jumpstarting interdisciplinary undergraduate research on time scales calculus applied to environmental science. Iowa Science Foundation Grant. Amount: $4994

**Meyer, C. K.** 2010-2011. Regional assessment of Platte River wetland restoration recovery. Nebraska State Wildlife Grants Program. Amount: $15,000

Whiles, M.R., S.G. Baer, and **C.K. Meyer**. 2006-2008. Evaluation of soils and associated belowground resources in central Platte River slough wetland restorations. Source: Nebraska Game and Parks Commission. Amount: $33,380

Whiles, M.R., S. G. Baer, and **C. K. Meyer**. 2003-2005. Biological evaluation of central Platte River slough wetland restorations. Source: U.S. Fish and Wildlife Service. Amount: $41,332

**Meyer, C.K.** 2003. Root and soil carbon and nitrogen evaluation in Platte River wetland restorations. Source: The Nature Conservancy Weaver Grant. Amount: $1,000

### Internal Funding

**Meyer, C. K.** 2011-2012. Does life cycle plasticity affect mass and tissue quality in periodical cicadas? Simpson College Research, Scholarship, and Creativity Grant. Amount: $2000

**Meyer, C.K.** 2011-2012. Aboveground soil mesocosms. Simpson College Course Development Enhancement Grant. Amount: $500

**Meyer, C.K.** 2010-2011. Supplement to Regional Evaluation of Platte River Wetland Restoration. Simpson College Research, Scholarship, and Creativity Grant. Amount: $2000

**Meyer, C.K.** 2009-2010. Simpson College Course Development and Enhancement Grant. Entomology Equipment. Amount: $500

## HONORS AND AWARDS

**Trio Student Support Services Faculty of the Year Award-** In appreciation of commitment to outstanding teaching and advising at Simpson College, 2011-2012
**Dissertation Research Assistantship Award-** Awarded to superior doctoral candidates at Southern Illinois University Carbondale, 2006-2007
**Florence and Charles Foote Award-** Awarded to the outstanding teaching assistant in the Department of Zoology, Southern Illinois University Carbondale, 2004-2005

## TEACHING EXPERIENCE

**Simpson College**
Biol 103L: Environmental Issues, lab, Biol 110L: Principles of Biology I, lab, Biol 135: Biostatistics, online,
Biol 145: Introductory Plant Biology, lecture and 2 labs, Biol 146: Lectures in Plant Biology, Biol 190: Great Plains Prairies, domestic travel course, Biol 197: Ecuador and the Galapagos Islands, international travel course, Biol 245: General Entomology, lecture and lab, Biol 290: Freshwater Restoration, field course, Biol 358: Freshwater Ecology, lecture and lab, Biol 365: Field Methods in Ecology, field course, Biol 371: Ecology Seminar, Biol 372: Environmental Science Capstone, Biol: Independent Research [35 students since Fall 2009], Biol: Independent and Directed study [9 students since Spring 2009]
SC 101 LA: Ethnobiology, first-year student course

## MEMBERSHIPS AND AFFILIATION

Iowa Academy of Science
Ecological Society of America
Lambda Delta Lambda, Honorary Society
Blue Key, Scholastic Honorary Society

## ACADEMIC SERVICE, SIMPSON COLLEGE

**Elected faculty committees**

| | |
|---|---|
| 2010-2012 | Multicultural and Minority Issues Committee, member |
| 2009-2010 | Teacher Education Committee, Secretary |

**Other institutional service**

| | |
|---|---|
| 2009-present | Undergraduate Research Working Group & Symposium Committee, co-chair |
| 2010-present | Tri-Beta Biological Student Honor Society, faculty advisor |
| 2011-present | Simpson Urban Studies Institute Advisory Committee, member |
| 2011-present | Biology and Environmental Science teaching assistant manager |
| 2010-present | Research Experience for Undergraduates information session, co-presenter |
| 2009-present | Represented Biology & Environmental Science at various prospective student events including the following: Fall Visit Day 2012, Experience Simpson Day 2011, Junior Visit Day 2011, Simpson College Majors/Minors Fair 2010-11, Fall Visit Day 2009, Junior Visit Day 2009, First-year student orientation 2009, Iowa private college week 2008-2012 |
| 2010-2012 | Coordinator for Moody and Orr Research Scholarships in Biology |
| 2011 | Presenter at SC Faculty Hour: Improving Students' Speaking/Presentation Skills |

| | |
|---|---|
| 2012 | Guest lecturer for Upward Bounds Biology Summer Course |
| 2010-2011 | Curriculum Written Communication embedded skill, review panel member |
| 2010, 2012 | Writing Competency II portfolio reader |
| 2010 | Working Group for Learning Communities, member |
| 2009-2010 | CIVL Advising Group, Member |
| 2009 | Curriculum Working Group for Oral Communication embedded skill, member |
| 2009 | Science Fair, judge for 3 special awards |
| Continuous | Currently serving as academic advisor for 22 undergraduate advisees |

**PROFESSIONAL SERVICE AND DEVELOPMENT**

| | |
|---|---|
| 2012-present: | Iowa Academy of Science Recognition and Awards Committee, member |
| 2010-present | Reviewer for Weaver Grant Program, Nebraska TNC |
| 2005-present | Journal reviewer for the following publications: *Castanea, Ecological Applications, Freshwater Science (previously JNABS), Journal of Applied Ecology, Journal of Insect Conservation, Restoration Ecology, Science of the Total Environment, Southwestern Naturalist, Western North American Naturalist, Wetlands* |
| 2013 | Reviewer for Northern Illinois University Intramural Opportunity Grants Program |
| 2012 | Reviewer for Iowa Academy of Science Grants Program |
| 2011-2012 | Reviewer for Maryland Sea Grant Omnibus 2011-12 RFP's preproposals |
| 2011-2012 | Reviewer for Maryland Sea Grant 2011-12 Final Process |
| 2009 | Attended CUR Institute, Beginning a Research Program in the Natural Sciences at a Predominantly Undergraduate Institution, Grand Rapids, Michigan |
| 2009 | Reviewer for text book proposal: Entomology Taxonomic Key; Wiley-Blackwell |
| 2009 | Attended Grassland Restoration Network meeting in Aurora, Nebraska |
| 2009 | IOWATER volunteer water sampler training workshop, Marshalltown, Iowa |
| 2006 | Reviewer for Text book chapters: Raven and Berg. 2006. *Environment*, 5th ed. |

**ORAL PRESENTATIONS SINCE 2008**

**Meyer, C. K.** 2012. Ecosystem Recovery in Restored Platte River Wetland Sloughs. The Crane Trust 1st Annual Research Symposium. Invited Presentation, Wood River, Nebraska.

P. Seiwert*, A. Statz*, and **C. K. Meyer**. 2012. Regional evaluation of Platte River wetlands. Undergraduate Symposium, Simpson College, Indianola, Iowa.

**Meyer, C. K.**, P. Seiwert*, B. Mikels*, S. Henrich*, and A. Statz*. 2011. Enhancing the Simpson experience with research. Invited Presentation, SC President's Society Dinner, Des Moines, Iowa.

**Meyer, C. K.** 2011. Mathematics and Biology: Evolution of the Mutualism. Invited Seminar, Spring Research Meeting of the Center for Undergraduate Research in Mathematics, Brigham Young University.

B. A. Mikels*, J. L. Mullen*, J. M. Jessee*, S. E. Henrich*, H. Berger, and **C. K. Meyer**. 2011. Assessment and Proposed Modification of Biological Sampling Regimes in Insect Populations. Spring Research Meeting of the Center for Undergraduate Research in Mathematics, Brigham Young University.

**Meyer, C. K.** 2010. Restoration Ecology: Regional Assessment of Recovery in Platte River Wetlands. Invited Seminar, Simpson College Summer Seminar Series.

**Meyer, C. K.** 2009. The Central Platte Valley: Assessing Recovery of a Degraded Landscape. Invited Seminar, Iowa State University, Department of Natural Resource Ecology and Management seminar series, Fall semester.

Baer, S. G., E. Bach, R. P. Klopf, **C. K. Meyer**, and J. Six. 2009. Soil texture modulates ecosystem recovery during C4 grassland development following long-term disturbance: an evaluation at regional and global scales. Annual meetings of the Ecological Society of America, Albuquerque, New Mexico.

Bach, E., **C. K. Meyer**, S. G. Baer, and J. W. Six. 2009. Soil microbial community recovery in two grassland restoration chronosequences on contrasting soils. Annual meetings of the Soil Ecological Society, Burlington, Vermont.

**Meyer, C. K.**, S. G. Baer, and J. Six. 2008. Ecosystem recovery is affected by soil texture in tallgrass prairie. Annual meetings of the Ecological Society of America, Milwaukee, Wisconsin.

**SELECTED POSTER PRESENTATIONS SINCE 2008**

A. Statz*, P. A. Seiwert*, and **C. K. Meyer**. 2011. Regional evaluation of recovery following restoration in Platte River wetlands. Annual meetings of the Ecological Society of America, Austin, Texas.

P. Seiwert*, A. Statz*, and **C. Meyer**. 2011. Regional assessment of recovery in Platte River wetlands using soil and plant indicators. Annual Meetings of the Iowa Academy of Science, Wartburg College, Waverly, Iowa.

**Meyer, C. K.**, M. R. Whiles, and S. G. Baer. 2009. Assessment of ecosystem recovery in restored Platte River Wetlands. Platte River Basin Research Symposium, Kearney, Nebraska.

Posters of undergraduate research mentees:

C. Fair*, P. Thompson*. 2012. Allelopathy in Warren County. Undergraduate Symposium, Simpson College, Indianola, Iowa.

A. Loudon*, K. Saxton*, A. Statz*. 2012. Diet of the Great Plains toad (*Bufo cognatus*) and the Plains Spadefoot toad (*Spea bombifrons*) in western Iowa. Undergraduate Symposium, Simpson College, Indianola, Iowa.

E. Lyon*. 2012. What's in your water? Concentrations of nitrates, phosphates, and *E. coli* in Central Iowa's private wells. Undergraduate Symposium, Simpson College, Indianola, Iowa.

P. Seiwert*, A. Statz*. 2012. Preliminary Water Quality Data for the Raccoon River Watershed Master Plan. Undergraduate Symposium, Simpson College, Indianola, Iowa.

A. Statz*, P. Seiwert*. 2012. Quantifying the accelerated emergence of 17-year periodical cicadas in Kansas riparian forest. Undergraduate Symposium, Simpson College, Indianola, Iowa.

B. A. Mikels*, J. L. Mullen*, J. M. Jessee*, S. E. Henrich*. 2011. Assessment and Proposed Modification of Biological Sampling Regimes in Insect Populations. Council on Undergraduate's 15th Annual Posters on the Hill, Washington, DC.

P. Seiwert*, A. Statz*. 2011. Evaluation of restoration efforts in Platte River wetlands. Undergraduate Symposium, Simpson College, Indianola, Iowa.

J. Van de Krol*. 2011. Measuring the effects of invasive autumn olive (*Elaeagnus umbellata*) on forest communities in central Iowa. Undergraduate Symposium, Simpson College, Indianola, Iowa.

Henrich, S.*, J. Jessee*, B. Mikels*, J. Mullen*. 2011. Assessment and proposed modification of biological sampling regimes in insect populations. Undergraduate Symposium, Simpson College, Indianola, Iowa.

*indicates undergraduate collaborator