© *Journal of Higher Education Outreach and Engagement*, Volume 12, Number 3, p. 33, (2008)

Working Together to Protect Ecological Diversity: A Community-Based Learning Case Study at University of Wisconsin–Parkside

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Abstract

This article focuses on a case study involving students and community working together to gain awareness and protect a threatened maple-beech forest. The students learned important concepts about ecology, biogeography, landscape fragmentation, and exotic invasion and were able to apply that knowledge later in the course. To connect their learning to the community, students shared their knowledge as "educators" for community volunteers, and discovered ways to inspire participation among the community near the site. Observed outcomes include the connection that students made between their studies and their responsibility to the community, and the sense of stewardship reflected in their continued efforts in maintaining natural habitats. This case study illustrates how students can incorporate their knowledge into community land use decisions, and how these types of projects can initiate networking opportunities to address important societal issues and build stronger communities.

Introduction

Many universities are now incorporating civic engagement components with community partners into the curriculum *(Hodge et al. 2001)* to help students see the connections between what they learn in courses and real-world problems. The primary goal is to build collaborative learning communities between educational institutions and the community through mutually beneficial partnerships. Thus, students help community agencies to identify, assess, and solve problems related to their organization's needs, while the agencies provide a way for students to apply their knowledge to real-life problems.

The University of Wisconsin–Parkside made a conscious decision to become a truly engaged campus in 1997 and actively recruited a chancellor to forge stronger connections with the surrounding communities. Because more than 75 percent of our students come from the area and stay here after graduation, this commitment offers a way to enhance our value to students, and a way of making a lasting and positive contribution to our community *(Ostheimer, Letven, and Statham 2001)*. The campus has established mechanisms

to further this goal, including the Institute for Community Based Learning and the Nonprofit Institute, which work together to match community projects to our regular credit courses and provide support throughout the semester to ensure that the projects achieve both their learning and their community development goals. Students can earn a Certificate for Community Based Learning (CBL) in their area of interest, if they wish. Courses with community projects are listed under a CBL designation in our course schedule.

We believe this approach to learning is an important component of our approach to our particular student body, which includes more than 20 percent "adult" students (over 25 years of age) and a fairly high proportion of first-generation college students. We were anxious to incorporate Community Based Learning into our curriculum in routine ways for two reasons. First, we hoped to help counter the decline in volunteerism present since the 1970s in our society in general *(Putnam 2000; Rosenblum 1998)* and among students in particular *(Levine 2003)*. But we were also aware of the evidence that suggests that adult students in particular benefit from opportunities for transformative learning that enable them to tie action, learning, and outcomes together *(Folkman and Rai 2001; Folkman and Rai 1997; Mezirow 1998)*. Carole Hahn *(2001, 110)* states that "the school curriculum should give students ample opportunity to discuss controversial issues in the classroom and to consider multiple positions and viewpoints on these issues. . . ." One means of doing this is by engaging students in aiding the local community and then creating a classroom climate that allows open student discussions concerning the problems they encounter. This style of learning will help to increase critical thinking and the understanding of diverse perspectives *(Delli Caprini and Keeter 2000)*.

One type of project involves addressing environmental issues. Such projects have been especially promising since the rise of the environmental movement and conservation organizations, both nationally and locally, in the mid-1980s *(Stevens 1995)*. Examples include the Coastal Cleanup Day, which began in 1985 in Los Angeles and is now a national activity. Local adaptations include the Volunteer Stewardship Network in the Lake County Forest Preserve District in Illinois, with activities that could range from planning to restoration work, and a volunteer group in North Carolina formed to protect local watersheds in the Pacolet Area Conservancy *(Stevens 1995; Kowal 2006)*. When students and volunteers work in their own communities, they will likely stay involved *(Light 2002; Ryan 2000; Pearce 1993)*. In time, students can help com-

munity volunteers and organization members learn techniques that can become a valuable source of local expertise.

The case study described in this article illustrates how a community-based course project can involve adult students who remain engaged in the community after a course or a degree is completed. Our goal is to examine the mechanics of a successful project by illustrating the concepts and tools students learn while working in the natural environment, how well students incorporate this knowledge into community land use decisions, and how these links facilitate future networking opportunities and involvement.

The Case Study: Education and Outreach

Beginning in the spring of 2005, Dr. Joy Wolf, a biogeographer at the University of Wisconsin–Parkside, has involved her students in a project focused on environmental preservation, native plant diversity, and the eradication of exotic species in a forest community. The study site, Renak-Polak Woods, is a mature maple-beech forest remnant located in Racine, Wisconsin, and owned by the university. The project, integrated into several of her geography courses, had multiple goals: encourage students' hands-on learning of ecological principles and vegetation dynamics, create a case-study template from which to build a foundation for the Applied Environmental Geography concentration in the curriculum, strengthen community efforts to work cohesively on issues related to this site, and work closely with conservancy groups to investigate ways to protect this particular site from further fragmentation.

In this case study that focuses on student learning and community outreach, Dr. Wolf has helped students in understanding the effect of garlic mustard on spring ephemeral diversity and in designing an eradication program that involved the community and adult volunteers. The project started in her Geography Field Methods course, where 50 percent of those enrolled were nontraditional students (close to or over 30 years old) who wanted to change careers or continue with graduate school. Prior to the study, only one student was aware of the conservancy organizations interested in this topic.

Using Renak-Polak Woods as a case study, students learned several important concepts, such as community dynamics, species competition, environmental limits, and biological invasion. The study site has a highly diverse understory blanketed with spring ephemeral species, but it is threatened by invasion from garlic mustard *(Alliaria petiolata)*. Biological invasion is a serious threat to native

species diversity, second only to habitat destruction. Garlic mustard was introduced into North America in the mid-1800s and can be competitive enough to displace many native spring species in this study site, such as *Isopyrum*, *Arisaema triphyllum*, *Phlox*, *Smilacina racemosa, Claytonia*, *Dentaria*, *Trillium grandifolium* (special concern), *Erythronium*, and *Asarum canadense*. A native to Europe, garlic mustard invades places such as North Africa, India, Sri Lanka, New Zealand *(Gleason and Cronquist 1991; Nuzzo 1993)*, Canada, and United States, with the highest densities in New England and the Midwest. The plant can occur in high densities, spatially outcompeting native species, and it is allelopathic, impeding germination of nearby plants *(Baskin and Baskin 1992; Anderson, Kelley, and Dhillion 1996; Meekins and McCarthy 1999)*.

"During this process, [students] began to critically think about complex issues of biological invasion and how to incorporate the community in this project."

Class discussions focused on the application of the scientific method to test different sampling designs to quantify diversity and use of biological control techniques. Students learned to identify trees with winter ecology skills and understory species according to life-history characteristics, and recorded how composition changed spatially, especially in association with garlic mustard. During this process, they began to critically think about complex issues of biological invasion and how to incorporate the community in this project. They learned to journal their own personal reflections as part of the learning process.

The students responded to a variety of analytical questions, based on their journal writing, experiences in the field, and research efforts. To understand research design and sampling techniques, students compared different approaches to reflect on some considerations researchers might feel are important to a successful project. Some sample discussion questions that focus on bio-invasion include, How are exotic species introduced to a new area? What are some barriers to dispersal of species? Discuss the ecological effects of exotics on native ecosystems. Are exotics always harmful?

Some students involved in this research were able to attend or present at local or national conferences. Several manuscripts associated with this research are in preparation as future publications.

Three of them include students as coauthors, because of their significant contributions, enthusiasm, and commitment to next year's expansion of the project. Students who have participated in the study assist in educating the first-year students about the study.

The case study will be used in Dr. Wolf's biogeography course as an introduction to thinking holistically and globally while investigating a complex issue such as biological invasion, and concepts such as competition and diversity, tolerance ranges, and disturbance regimes. These students can hold discussions with the Friends of Renak-Polak Woods group concerning the research and preservation of the woods, both from an ecological and a land-use standpoint.

The Community Effort

To connect their learning to the community efforts, students were assigned to be "educators" for community volunteers. The following analytical questions provided the confidence to interact with community volunteers or conservation groups:

- When a volunteer asks you about this project in terms of *diversity*, how do you answer? Discuss Renak-Polak Woods in landscape diversity, understory diversity, threats to diversity.
- When a volunteer asks you about the project in terms of *research methods*, how would you describe the project? Why did we choose the methods we did to capture the data?
- When a volunteer asks you about the project, in terms of *biological invasion and control methods*, what would you say? Why did we choose the control methods we did? Discuss facilitators and limitations to invasion, and ecological effects of exotic species on native ecosystems.

After their experience with the community members, the students were asked to respond to questions to help them understand the value of community outreach. These questions include:

- What did you learn about the community volunteers? What are their talents, limitations, contributions?
- Did you feel confident about discussing ecological concepts and biological invasion with the community?
- The community views you as future land managers, and stewards of UW–Parkside. How did you describe your education in applied environmental research? What was their reaction?

- If you were able to continue working with the community on this project, what outreach activities do you think would be worthwhile to ensure the success of this project?

The student-community outreach component encouraged students in other courses to become involved in this case study. In the Senior Seminar course, Dr. Wolf supervised students who used the case study for their final project. One student designed a study of the canopy dynamics using a Global Positioning System (GPS) to record tree data from plots and transects within the site. In this way, he could reveal important information about spatial associations, density, composition, and topography correlations in the landscape using Geographic Information Systems (GIS). Another student used GPS/GIS technology to map garlic mustard locations and natural features in the site. Both of these students went on to other projects that helped the community become more involved in the natural environment because of their experience with Renak-Polak Woods. Another student in the Senior Seminar course wrote a literature summary of biological invasion and conducted a comparison experiment of soil characteristics in garlic mustard patches. In the following semester, she incorporated this case study into her work in Dr. Wolf's landscape ecology course. In this second course, students worked together to learn how patch dynamics, disturbance regimes, corridor patterns, edge effect, and fragmentation play a role in coarse-scale patterns and spread of invasion.

"Students might come from geology, sociology, anthropology, land use planning, or management and political science to focus on the social, cultural, and political implications of the issues faced here."

A variety of students were involved. One biology student was funded by a Deans Grant to help Dr. Wolf create a species guidebook for the study site from resources obtained by the Nature Conservancy and the UW–Madison herbarium. It was helpful to the students and volunteers. Other students in biology and environmental studies participated as field assistants. Students might come from geology, sociology, anthropology, land use planning, or management and political science to focus on the social, cultural, and political implications of the issues faced here. Other colleges and high schools are learning about the research. For instance, a forest ecology class from Carthage College and an honors science

class from Salem Central High School came to the site to learn about understory diversity and disturbance ecology.

In the landscape ecology course, the case study was the focus for student projects. Some used the site to design and implement an interpretive nature trail. The interpretive trail is an instrument to educate the public about the unique and fragile state of Renak-Polak Woods, the research that is being conducted there, and how their own contribution can make a difference. Other students studied canopy tree regeneration patterns and patch development within the site. Using survey records, another student contacted local land managers to make them aware of the project being conducted in this state natural area and to offer an opportunity for collaboration, and made measurements using aerial photographs to interpret and quantify connectedness throughout the watershed. Her work was to design a plan with the community to protect natural corridors surrounding the study site. This particular student presented her research to the township leaders, and was later asked to consult on land use issues. She and her husband own a farm near the study site. Currently, she works full-time for the post office, but she desires a career that focuses on her vested interest in sustainable planning and environmental fragmentation. In the next semester, she will conduct an independent study project that will involve working with the Caledonia Conservancy and Kenosha/Racine Land Trust to make decisions on plans for future open space surrounding the study site. Since members of the conservancy identify the stewardship of the Renak-Polak Woods as a top priority, the goal would be to learn ways to acquire adjacent land to increase wooded boundaries and create barriers to limit the threat of damage from new-generation neighbors.

Some of the students who volunteered their time with this project continued to volunteer with community efforts on behalf of the environment after they graduated. For instance, one of our geography graduating students earned the respect of her northern Wisconsin community; she was asked to write a grant and design a study to eradicate the exotic species in the community green spaces. One geography graduate used his new skills to help with garlic mustard mapping in another location, while another graduate volunteered at a national park in Maine. Because of his experience in this study, one biology student was hired as a paid intern with a local consulting firm to ecologically restore nearby protected lands. Other opportunities for students are Sustainable Racine, the Nature Conservancy, and Department of Natural Resources—all avenues for internship possibilities.

This geographic area is fortunate to have a community of people who care about their natural environment. They are eager to know where their support and energies are needed. In part, the focus on community outreach was to educate volunteers on diversity research and eradication work, and seek future collaborations with local organizations. Getting the word out to potential volunteers was achieved in a variety of ways. Before the research was under way, the *Kenosha News* contacted Dr. Wolf for an interview and published an article about the project, which generated several phone calls from interested citizens. Dr. Wolf was also invited to write a column on biological invasion for the Olympia Brown Unitarian Universalist Church newsletter and to present the study to the Green Sanctuary committee. The volunteers from this avenue were excited to learn about ways to sustain environmental integrity. She was also invited to speak as a panel member in collaboration with the Caledonia Conservancy and Kenosha/Racine Land Trust, to discuss landscape ecology, ways to protect natural areas, and threats from biological invasion and garlic mustard.

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As part of community outreach, she and her students mailed flyers to the surrounding neighborhood and held an open house workshop to answer questions and discuss the research, both from the ecological standpoint of preserving the woods and from a land use standpoint. The open house encouraged participation from neighbors. These volunteers can take part in the project in a variety of ways, such as working with students in the field with the data collection or garlic mustard eradication.

This study promotes a strong network between the University of Wisconsin–Parkside and local community institutions, including Caledonia Conservancy, the Nature Conservancy, Department of Natural Resources, Olympia Brown Unitarian Universalist Church, and Cedarburg Science. This case study generated a great deal of interest among the general community as well. Other local resources that are involved include Friends of Renak-Polak Woods, Wild Ones, and S. E. Johnson Co. In an effort to continue a strong partnership between members of Town of Caledonia, community partners are working with students to build a relationship with volunteers and conduct "field workshops." To this end, we have

support from the Kenosha/Racine Land Trust to strengthen community outreach and build a foundation for the Friends of Renak-Polak Woods. With the help of the Kenosha/Racine Land Trust, we can continue to communicate information about the project to concerned neighbors and the general public. Building on the awareness and enthusiasm of the students and community volunteers, continuing this type of work helps build stronger communities and strengthens important values, including understanding the impact of invasive species, the power of networking in the community, and the educational value of linking students and community members in hands-on environmental projects *(Putnam 2000; Ogilvie 2004)*.

The students spent a significant amount of time during class considering how they would work with the community in this research. When the students began their experience in sharing their knowledge with the community, they found that volunteers really make a difference! On "Saturday volunteer days," students had invaluable experience in communicating the research to these interesting and interested people. Because of what they learned from this project, they felt prepared to interact with the volunteers about all aspects of the project and felt confident as university representatives who are dedicated to restoration ecology. It was heartening to see these undergraduate students and community residents share knowledge and respect for each other. As a form of community recognition, the project was nominated for the Invader Crusader Award, and Dr. Wolf received a letter of recognition signed by the governor of Wisconsin. Certainly the award also belongs to the community members and students who participated in the project. In the next year, students are ready to embrace the much-appreciated network of community organizations and volunteers. The *Kenosha News* has maintained interest in this study, and the journalist who wrote the earlier article plans to run a story about the new components of the study, last year's successes, and implications for future research and community outreach. In addition, Dr. Wolf was encouraged speak on a local radio station to discuss this important study and the threat of biological invasion. This is a high-profile opportunity for community outreach.

Conclusions

The significance of this work lies in the educational value of the project, the community outreach, and the research that is presented to scientific and public audiences. Specific positive outcomes include the research and education experience for students; collaboration with the community; a case study where students

can learn about environmental integrity, biological invasion, field methods, native diversity, fragmentation, and vegetation dynamics; and the collection of important data that will be useful to the professional environmental restoration community.

Students and community volunteers together increased their knowledge of this important environmental corridor by participating and by understanding how they can help over the long run, and developed stronger interpersonal relationships. Volunteers and students value the educational component of their project, and they achieve a sense of ownership that facilitates long-term maintenance because they are investing in their own communities *(Stevens 1995; Grese et al. 2000)*. In ecologically based projects, community participation, especially by volunteers, is crucial *(Light 2000, 2002; Grese et al. 2000; Pearce 1993)*, given government spending cuts on environmental issues *(Schroeder 2000)*. Efforts for expanding the project into a second year provide opportunities for more students and volunteers to become involved in conservation groups and learn about diversity research and garlic mustard eradication.

Our campus is making efforts to join the ranks of those institutions that move beyond the rhetoric of civic engagement to actually doing the work of engagement. A commitment to engaged discovery, scholarship, teaching, and learning ensures a successfully engaged campus *(Brukardt et al. 2004)* and the building of successful partnerships among faculty and community practitioners, nonprofits, and local governments *(Dugery and Knowles 2003)*. These partnerships must be a joint exploration of goals and interests, shared leadership and decision making, and exchange of knowledge and expertise *(Holland 2001)*. Civic engagement must be built into the philosophy and mission for the institution; awareness, support, and leadership for faculty; opportunities, awareness, involvement, and leadership for students; and awareness and understanding for community partners *(Furco 2002)*.

Our faculty, students, staff, and administrators attempt to understand the value of our community partners and provide their expertise as a bonus for student learning. When faculty and students work together to build long-term relationships with community partners, the result is a variety of mutually beneficial outcomes, with valued community goals and student learning opportunities.

Acknowledgments

This study was funded by a Civic Engagement Fellowship award from the University of Wisconsin–Parkside, through a grant

from the Root-Pike Watershed Initiative Network, and by the University Provost Award. We would like to thank all the community volunteers, including Heather Patti from Cedarburg Science, Kay McClelland from Wild Ones, and volunteers from Olympia Brown Unitarian Universalist Church, and University of Wisconsin–Parkside students who assisted in the fieldwork and educational aspects of this project, especially Tasha Brnak, Christopher Coleman, Jon Grove, Judy Grove, Timothy Leveque, Heather Palmquist, and Michael Stanton.

References

Anderson, R. C., T. C. Kelley, and S. S. Dhillion. 1996. Aspects of the ecology of an invasive plant, garlic mustard (*Alliaria petiolata*), in central Illinois. *Restoration Ecology* 4: 181–91.

Baskin, J. M., and C. C. Baskin. 1992. Seed germination biology of the weedy biennial *Alliaria petiolata*. *Natural Areas Journal* 12: 191–97.

Brukardt, Mary Janme, Barbara Halland, Stephen Percy, and Nancy Zimpher. 2004. Calling the question: Is higher education ready to commit to community education? Wingspread Conference Report, available from the Milwaukee Idea Office, University of Wisconsin–Milwaukee, Wisconsin.

Delli Caprini, M. X., and S. Keeter. 2000. What should be learned through service learning. *Political Science and Politics* 33: 635–37.

Dugery, Jacqueline, and James Knowles. 2003. *University + community partnerships: A new approach*. Charlottesville, VA: Pew Partnership for Civic Change.

Folkman, D., and K. Rai. 2001. Practicing action learning in a community context. *Adult Learning* 11 (3): 15–17.

Folkman, Daniel, and Kalyani Rai. 1997. Reflections on facilitating a participatory community self evaluation. *Evaluation and Program Planning* 20: 455–65.

Furco, Andrew. 2002. *Self-assessment rubric for the institutionalization of service- learning in higher education*. Campus Compact Publication available from Service-Learning Research and Development Center, University of California–Berkeley.

Gleason, H. A., and A. Cronquist. 1991. *Manual of vascular plants of the Northeastern United States and adjacent Canada*. 2nd ed. Bronx, NY: The New York Botanical Garden.

Grese, Robert E., R. Kaplan, R. L. Ryan, and J. Buxton. 2000. Psychological benefits of volunteering in stewardship programs. In *Restoring nature: Perspectives from the social sciences and humanities*, ed. Paul H. Gobster and R. Bruce Hull, 265–80. Washington, DC: Island Press.

Hahn, C. L. 2001. What can be done to encourage civic engagement in youth? *Social Education* 65: 108–10.

Hodge, G., T. Lewis, K. Kramer, and R. Hughes. 2001. Collaboration for excellence: Engaged scholarship at Collin County Community College. *Community College Journal of Research and Practice* 25: 675–90.

Holland, Barbara. 2001. *Characteristics of engaged institutions and sustainable partnerships, and effective strategies for change*. Washington, DC: U.S. Department of Housing and Urban Development, Office of University Partnerships.

Kowal, J. [2006]. Conservation open space, ecological restoration and volunteerism at the urban fringe. Dissertation to be defended in 2006 at University of Wisconsin–Milwaukee. In the author's possession.

Levine, P. 2003. The civic mission of schools. *National Civic Review* 92: 63–65.

Light, Andrew. 2000. The value of participation and the risks of professionalism. In *Restoring nature: Perspectives from the social sciences and humanities*, ed. Paul H. Gobster and R. Bruce Hull, 163–81. Washington, DC: Island Press.

Light, Andrew. 2002. Restoring ecological citizenship. In *Democracy and the claims of nature*, ed. B. Minteer and B. P. Taylor, 153–72. Lanham, MD: Rowman and Littlefield.

Meekins, J. F., and B. C. McCarthy. 1999. Competitive ability of *Alliaria petiolata*, an invasive nonindigenous forest herb. *International Journal of Plant Science* 160: 743–52.

Mezirow, J. 1998. On critical reflection. *Adult Education Quarterly* 48 (3): 185–98.

Nuzzo, V. A. 1993. Distribution and spread of the invasive biennial garlic mustard (*Alliaria petiolata*) in North America. In *Biological pollution: The control and impact of invasive exotic species*, ed. B. N. McNight, 137–46. Indianapolis: Indiana Academy of Science.

Ogilvie, Robert S. 2004. *Voluntarism, community life, and the American ethic*. Bloomington: Indiana University Press.

Ostheimer, John, Esther Letven, and Anne Statham. 2001. Institutionalizing university-community engagement. *Metropolitan Universities: An International Forum* 12: 63–75.

Pearce, Jone L. 1993. *Volunteers: The organizational behavior of unpaid workers*. New York: Routledge.

Putnam, Robert D. 2000. *Bowling alone: The collapse and revival of American community*. New York: Simon and Schuster.

Rosenblum, Nancy L. 1998. *Membership and morals: The personal uses of pluralism in America*. Princeton, NJ: Princeton University Press.

Ryan, Robert L. 2000. A people-centered approach to designing and managing restoration projects. In *Restoring nature: Perspectives from the social sciences and humanities*, ed. Paul H. Gobster and R. Bruce Hull, 209–28. Washington, DC: Island Press.

Schroeder, H. W. 2000. The restoration experience: Volunteers' motives, values, and concepts of nature. In *Restoring nature: Perspectives from the social sciences and humanities*, ed. Paul H. Gobster and R. Bruce Hull, 247–64. Washington, DC: Island Press.

Stevens, William K. 1995. *Miracle under the oaks: The revival of nature in America*. New York: Pocket Books.

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