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Exploring the Human
Dimensions of Eco-
restoration**

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It's Not Just for Plants: Exploring the Human Dimensions of Eco-restoration

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Abstract

Eco-restoration projects can accomplish many environmental goals, from planting trees to restoring wetlands to creating habitat. Many natural areas in urban and suburban cities and towns face increasing pressure from development. Eco-restoration projects can be a good way to preserve and enhance community green space and ensure residents have access to recreational and restorative experiences. Several eco-restoration projects are currently being undertaken in Bloomington, Indiana – from invasive species removal to native woodland restoration. This qualitative pilot study serves as an initial investigation into the benefits of student participation in outdoor education service learning experiences. Results indicated educational benefits by applying classroom content to a real-world context, social benefits from interacting with peers, psychological benefits from doing meaningful work, and a strong sense of stewardship that participants hoped to promote to the community.

Keywords: Outdoor education, eco-restoration, service learning, public health

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Introduction

As populations shift from rural to more urban and suburban areas, so too does responsibility for conservation of the natural environment shift to people living in cities (Dunn, Gavin, Sanchez & Solomon, 2006). People who directly interact with nature are more likely to take pro-conservation action (Dunn et al., 2006). Consequently, eco-restoration in urban and suburban areas has become increasingly important as a means to foster such interactions since city dwellers have fewer opportunities for daily encounters with nature (Dunn et al., 2006).

The goal of eco-restoration projects can range from the reestablishment of native plant species to the creation of wildlife habitat to the restoration of ecosystem processes (Barro & Dwyer, 2000). Eco-restoration projects restore more than the ecosystem; they can offer social and psychological benefits to participants and empower communities to promote conservation (Leigh, 2005). According to Leigh (2005) reconnecting individuals with the local landscape through eco-restoration can positively influence a conservation ethic in a community. Other studies have shown engaging in meaningful work to protect natural places from development, seeing the tangible benefits of a day's work, a sense of accomplishment, learning about nature, learning new skills, meeting like-minded people, and networking have been among the benefits of participating in eco-restoration projects (Grese, Kaplan, Ryan & Buxton, 2000; Miles, Sullivan, & Kuo, 1998).

Several eco-restoration projects are underway in the city of Bloomington, Indiana by a group of individuals and organizations working on the Bloomington Urban Woodlands Project (BUWP). A key project for the group is invasive species removal and the cultivation of native plant species in Dunn's Woods on the Indiana University (IU) campus. Additionally, the BUWP is working on native woodlands restoration at Latimer Woods, a 10-acre city-owned lot that is protected by a conservation ease-

ment and managed by the municipal parks department. Finally, watershed monitoring is being conducted at Griffy Woods, one of seven sites that comprise the IU Research and Teaching Preserve (IURTP). The fieldwork is done primarily by volunteers and IU graduate and undergraduate students enrolled in service learning classes. This pilot study was an initial exploration of the educational, social, and psychological impacts from participating in eco-restoration activities.

Literature Review

Eco-restoration can take on many forms from removing invasive species, to restoring wetlands, to cleaning up a river. Projects can be small in scale as in local woodlands or as large as the Chesapeake Bay. Natural and restored areas can provide a host of ecosystem services that support human health, quality of life, and well-being. These services include carbon sequestration, pollination, food production, water purification, soil stabilization, landscape aesthetic benefits, and recreation opportunities (Fisher, Turner, & Morling, 2008). Ecosystem services have become increasingly relevant as the planet's population has increased pressures on natural areas and obstructed those services once presumed to be unlimited, making them paramount to public health (Lee, 2005, p. v). The benefits of engaging in eco-restoration projects expand beyond the area's ecology to community and individual level benefits and impacts. As city populations continue to grow and rural lands and communities are abandoned, eco-restoration can be an effective way to protect and restore nature and its services through activities that spur environmental socialization (Bixler & James, 2005), support the innate bond between humans and nature (Wilson, 1984), and ultimately empower individuals and entire communities (Barro & Dwyer, 2000).

Community Benefits

There are many potential ways a community can benefit from eco-restoration. However, in order for benefits to be realized, members of the community should be involved and understand what the project seeks to accomplish. Members of adjacent communities may have a strong attachment to the proposed restoration area and accompanying strong feelings about how it should be managed. Organizations that manage eco-restoration projects may have a vision for how a proposed restoration area should be managed that conflicts with the vision of local community members. Addressing this potential for conflict can be one of the greatest challenges of eco-restoration (Ryan, 2005).

Working with community members throughout the planning process can minimize negative impacts and maximize benefits (Davenport, Bridges, Mangun, Carver, & Williard, 2010). Balancing the modern needs of the community with the goals of eco-restoration can help bring the community together through shared labor (Higgs, 2003) and reconnect people to nature (Leigh, 2005). Eco-restoration projects can also offer educational opportunities for local communities (Purcell, 2007), while successful eco-restoration in neighborhoods can benefit the community through the development of social capital, community resilience (Tidball & Stedman, 2013; Schroeder, 2000), economic benefits (Aronson et al., 2010), and improved aesthetics for outdoor activities (van Marwijk, Elands, Kampen, Terlouw, Pitt et al., 2012). A desire to improve areas for community outdoor recreation can be a motivating factor for eco-restoration volunteers (Bruyere & Rappe, 2007).

Social and Psychological Benefits

Volunteer benefits of eco-restoration are increasingly being studied (DiEnno & Thompson, 2013; Egan, Hjerpe, & Abrams, 2011; Hall & Bauer-Armstrong, 2010; Clary & Snyder, 1999). Land management agencies have looked at eco-restoration

with a more holistic approach that includes a greater emphasis on the role of people in planning and implementing eco-restoration projects (Schroeder, 2000). Volunteers may seek to help the environment, re-engage with nature, and/or find spiritual fulfillment (Clewel & Aronson, 2013). Others hope to achieve a sense of accomplishment, alleviate environmental guilt, learn, and share ideas (DiEnno & Thompson, 2013). Volunteers are often motivated initially by a desire to help the environment and to learn but it is positive social effects experienced on-site that can contribute to repeat volunteering (Ryan, Kaplan, & Grese, 2001). This example is consistent with the conceptualization of volunteering as serious leisure where volunteers benefit from personal and social rewards (Stebbins, 2010). Social rewards include opportunities to associate with others in the social world of the activity, accomplish a task as a group, feeling needed, helping, and being altruistic (Stebbins, 2010). Volunteering on eco-restoration projects may also positively influence pro-environmental attitude and behavior (Ryan et al., 2001).

Eco-restoration activities offer volunteers psychological and social benefits by engaging with nature through labor (Leigh, 2005). The specific benefits volunteers report mirror their motivations for getting involved. Protecting the natural environment, a chance to connect to the outdoors, and socializing with others are among the most common benefits (Grese et al., 2000). Engaging in meaningful, useful work, feeling a sense of accomplishment, and learning about nature were reported as benefits in one of the first studies of psychological and social benefits of eco-restoration (Miles et al., 1998). In addition, volunteers may feel more satisfied, calm, or talkative immediately after their workday and experience less stress and mental fatigue while experiencing more alertness and improved fitness in the long-term (O'Brien, Townsend, & Ebdon, 2010). These benefits follow Kaplan and Kaplan's (1989) attention restoration theory, which states that spend-

ing time in nature can provide recovery from mental fatigue. Stewardship of green spaces can also increase social capital (Burls, 2007). Lastly, Kals, Schumacher, and Montado (1999) found an emotional attachment to nature could positively predict protective behavior towards nature. Their study found that the amount of time presently spent in nature influenced emotional affinity towards nature, which in turn influenced willingness to personally engage in nature protective behavior.

The literature suggests that eco-restoration projects have the potential to positively impact the local ecosystem, the community, and the participants themselves. Communities may benefit from the maintenance of ecosystem services and increased environmental awareness of participants. Volunteering may positively influence public health by offering community members opportunities to connect with nature and recover from mental fatigue. Finally, eco-restoration projects offer opportunities for recreation through serious leisure.

While there are many studies on using eco-restoration projects as educational tools (Kondolf, G. M., Mozingo, L. A., Kullmann, K., McBride, J. R., & Anderson, 2013; Schaefer, V. & Gonzales, E., 2013; Hall & Bauer-Armstrong, 2010), none have explicitly focused on the student eco-restoration experience through a social or psychological lens. Accordingly, this study sought to explore the social and psychological impacts in addition to educational outcomes of participation in eco-restoration via a service learning experience at the university level. The results of this study add to the theoretical knowledge on human dimensions of eco-restoration projects and provide implications for public health, recreation, and leisure professionals who work with community based projects.

Methodology

Study Sites

The Bloomington Urban Woodlands Project (BUWP) began in 2010 with the goal of eradicating

invasive plants that had diminished the biodiversity of native plants in Dunn's Woods through volunteer efforts and by conducting research and community educational outreach. In 2012, the project expanded to Latimer Woods. The project is supported by an Indiana University Office of Sustainability Research Development Grant and by the National Audubon Society and Toyota's TogetherGreen Innovation Grant Program (Bloomington Urban Woodlands Project, 2013).

Dunn's Woods is a 10-acre forest in the heart of the Indiana University campus in Bloomington. Originally part of the Dunn family farm, it was purchased from the Dunn family in 1883 and has been preserved from development to maintain the natural beauty of campus. The primary invasive plant that threatens biodiversity is *Euonymus fortunei* (Purple Wintercreeper) and restoration work focuses on eradicating it. Similarly, Latimer Woods, located approximately 1.5 miles south of the IU campus, was originally part of a family farm and is also approximately 10 acres. It is administered by the City of Bloomington Parks and Recreation Department as part of its parks and trails system (Bloomington Urban Woodlands Project, 2013). The primary invasive plants volunteers have worked on eradicating in Latimer Woods are *Lonicera maackii*, *L. tatarica*, *L. morrowii*, and *L. X bella* (Bush Honeysuckle). Other species being managed there include *Lonicera japonica* (Japanese Honeysuckle), *Ranunculus ficaria* (Lesser Celandine), and *Alliaria petiolata* (Garlic Mustard). The IU Research and Teaching Preserve (IURTP) consists of approximately 1600 acres spread over seven sites near the IU campus in Bloomington, Indiana. Volunteers assisted with watershed monitoring in Griffy Woods as part of a research project in the fall of 2013.

Participant Recruitment and Selection

This study utilized in-depth phone interviews (n = 5) to explore the participants' experience in an eco-restoration service learning experience.

Respondents participated in eco-restoration projects at Dunn's Woods, Latimer Woods, or the IURTP. A convenience sampling approach (Riddick & Russell, 2008) was used to recruit respondents. Email addresses were obtained from three (two undergraduate, one graduate) IU biology course lists that met during the 2012-2013 school year. Each course participated in service learning at Dunn's Woods or Latimer Woods. Additional respondents were recruited from a list of volunteers at the IURTP from 2012 and 2013. A total of 48 potential respondents were sent an email requesting an interview (33 from biology classes and 15 from IURTP). Three emails were bounced back as undeliverable leaving a total of 45 potential respondents. A follow-up reminder email was sent three days after the initial request to increase response rate. Five contacts agreed to be interviewed for a response rate of 11%.

Data Collection and Analysis Methods

Telephone interviews were scheduled via email and conducted over the first three weeks of November 2013. Interviews lasted 13 to 26 minutes, were recorded, and followed a semi-structured format. To start the interview, respondents were asked to describe their experience at Dunn's Woods, Latimer Woods, or the IURTP. Next, questions such as "What were your expectations about your experience prior to engaging in it?", "What was accomplished through your participation with the BUWP (IURTP)?", "Do you think you benefited from the experience?" and "How important do you think it is for humans to take care of the natural environment in their urban/suburban communities?" were asked. Respondents were also asked about the number of hours they participated, their environmental attitudes and perceptions, and related classwork.

Interview data was subjected to phenomenological data analysis. This included three primary steps: (1) investigation of the phenomena through semi-structured interviews (Bernard, 2006), (2) identification of general themes/essences of the phenom-

ena, and (3) delineation of essential relationships among the themes (Creswell 2007). Step 1 included the conducting, recording, and transcribing of the interviews. Step 2, the coding of data using QSR NVivo software, included the review of interview transcripts and open coding of key terms found throughout multiple interviews. Following the open coding exercise, the codes were reviewed and axially coded to understand the context for the key terms. In Step 3, important phrases/data were extracted from the transcripts and grouped with like passages found in other interviews to develop themes. Finally, the emergent themes and the associated data were cross-checked among two researchers familiar with the phenomenological analysis process to establish consensus on the coded data and its placement among the themes (Creswell 2007). Similar to interpretive biographers, phenomenology views verification and standards as largely related to the researchers' interpretations (Moustakas 1994). General thematic coding and classification was used on data that were readily quantifiable, such as demographics.

Results

Respondents consisted of three females and two males whose time spent participating in eco-restoration activities ranged from a single two-hour session ($n = 2$) to five three-hour sessions ($n = 2$) to three four-hour sessions ($n = 1$). The primary activity engaged in during the majority of these sessions was planting native plants as all five respondents described doing so. Other activities included learning about native plants from project leaders ($n = 3$), pulling invasive plants ($n = 2$) and participating in bird and butterfly walks ($n = 2$). In addition to planting native species, the respondent who volunteered at the IURTP completed a different set of tasks related to watershed monitoring including installing weirs and digging trenches.

Three major components of the eco-restoration experience emerged from the phenomenological data analysis as being most important to

the participants' experience. They were (1) location-based learning, (2) social benefits, and (3) pro-environmental impact. As a result of engaging in these three components of the experience, respondents were moved to talk about the importance of sharing what they learned with others in order to promote stewardship and opportunities for restorative experiences.

Location-based learning

The four respondents who were part of a service learning class in the biology department all talked about the importance of getting out of the classroom to learn, describing the experience with words like "good," "cool," "fulfilling," and "rewarding." Respondents discussed with enthusiasm the advantages of experiential learning in helping to tie together concepts, making the experience enjoyable, and even developing attachment to the place. Respondent #1 said, "It's always good to get out of the classroom...integrating our studying in with the actual environment that we live in. It was pretty rewarding." Respondent #2 expressed appreciation for supplementing classroom learning with eco-restoration activities by saying, "It adds a whole new level...It sticks with you a lot more than if you're reading about it in a book." The sentiment was echoed by respondent #5 who stated, "You're not just looking at black and white words on a page." Two respondents expanded on their comments by offering vivid comparisons of classroom learning to the eco-restoration experience. Respondent #5 said,

There's a huge difference between just, I mean, you can sit and read about what sort of species are found in Indiana or found anywhere but to actually go out and see them is a completely different thing. It really sort of takes you out of the literature and out of the words and puts you in there...being in the woodlands and doing all of that and having the sort of sense of place while you're

doing it. It makes the learning experience much more informative and much more personal because you are actually experiencing it.

This individual described how actively participating in a learning experience and seeing the actual land, plants, and animals made it easier to personally relate to the information. Respondent #2 described the benefits of engaging in eco-restoration as a sensory experience.

Going out there is key because when you're in a classroom you can learn. Teachers can tell you all they want. They can make you read all the readings they want but none of that simulates any of the human senses that are going to activate long-term memory, in my opinion. Going out there in the field, touching things, being around the smells and sounds, and just being able to appreciate what's out there and what we have.

This respondent would then discuss how being in Dunn's Woods enhanced opportunities for learning its natural and cultural history.

To discuss that out in the field where you are and where it all happened. That was kind of cool. We reflected a lot on that. We were able to ask questions, challenge things, question things. It was very comfortable. We were all there just to learn and reflect, understand.

In the above examples, respondents suggest the learning environment that was created through eco-restoration fieldwork increased their opportunities for emotional attachment and knowledge retention. Students discussed other benefits from the fieldwork as well. Completing the tasks in the field and learning why they were essential helped increase understanding by tying together classroom learning

with the restoration activities as respondent #3 reported,

As long as it's tied into the idea, tied into "here's what we're doing and why. Here's why it's important." And then getting your hands into it, it kind of brings it all together. Obviously, just going out there and leaving wouldn't have the same impact that explaining the reasons behind it does.

Respondents reported complementary exercises like birding and butterfly walks helped to increase understanding of the project's goals, the enjoyment of the experience, and the development of an emotional attachment to the place. As respondent #5 put it, "We got to actively participate...being able to see what was out there and learn how to identify the calls and see the diversity with somebody who knew the diversity was pretty spectacular." Later, this respondent added that the "smells, the sounds, the feeling in walking and hearing leaves...it makes me more comfortable. I can go around and it's like my home. I live here. I know these plants. Things like that."

An opportunity to reflect on the eco-restoration experience to make connections between the fieldwork and the underlying concepts was discussed by some respondents. Respondent #5 explained the combination of personal reflection and discussion with fellow participants during and after the workday.

There were always opportunities for us to converse about our experiences and the whole course was very discussion heavy. So even though we'd be talking and learning while we were at Latimer Woods, following that, the following class period, we would always have conversations about what we did, what we thought about it. [The instructor] always wanted to know how we felt about the activities we did. So there was

personal reflection and then we'd also all converse about our experiences together.

Respondent #5 elaborated by explaining how the discussions were motivating and helped her to appreciate what the fieldwork accomplished.

Every time it felt new and I learned more things and it was invigorating. Afterwards there was always time for us to talk about what was really cool...I think that definitely helped me start to appreciate what I had done more.

Social Benefits

While formal and informal discussion during and after the workday contributed to the educational experience, discussions also impacted the social aspect of the eco-restoration experience. The reported social benefits of working alongside others included the opportunity to talk about personal and educational interests, the opportunity to explore adding a minor field of study, and the opportunity to talk about further involvement in a research project.

Three respondents specifically addressed how getting to know fellow participants in the field also made for an enjoyable experience. "We all got along well. It was a nice group of people, interesting backgrounds...everyone was really cool," said respondent #3. Respondent #2 described the experience with the other participants as "...having a great time, looking at stuff, taking pictures, talking about stuff, talking about our research, and how it applies to this and that." Respondent #4 said, "I really enjoyed the experience. The guys I worked with were cool...definitely interested in going back again." He not only reported an enjoyable experience but also explained additional benefits from interacting with other participants, who he described as like-minded individuals with similar experience.

I got to talk to them a lot. I was out there with them for several hours. I talked to [another student] and he went through the same

major that I'm going through and we kind of had similar interests so we got talking about that and future jobs and stuff like that. It was pretty cool.

These conversations also helped this respondent, a sophomore, figure out which direction to take his studies and make helpful contacts for potential future jobs.

Getting out there and working with these guys who are in a similar position helped me realize more what I wanted to do in the future and just make some good connections with those guys, learn some things. Like I said I was given the opportunity to be on a research team so I could put that on my resume. It's just all these connections and people I've met. Not only are they cool people but I've been able to make good business-like connections. I guess it will just help me in the future as well.

In the short term, this respondent felt he benefited through in-depth conversations with the project leader because they led to his further involvement in the project and the field.

The grad student who is in charge of the project, she's pretty cool and even asked me if I wanted to be part of her data collection team for the research project...Mostly learning stuff from her, that kind of helped me, steered me towards adding a minor from the resource management stuff at SPEA [School of Public and Environmental Affairs].

Pro-Environmental Impact

Through carrying out the actual physical tasks in the field like planting native plants or removing invasive species respondents were able to see the impact of the work and how the ecosystem benefits. Many reported that being able to see the

tangible results of a day's efforts gave them a sense of accomplishment and pride in completing important work. Respondents also talked about the project's goal of removing invasive species and replacing them with native plants. After participating in this eco-restoration activity, respondents described the importance of doing such work. Respondent #1 described how removing the invasive species "...was rewarding because you see how taking care of and managing it we can turn the tide." Respondent #2 said, "the biggest impact we had there is the removal of invasive Bush honeysuckle." After pulling invasive species and planting native plants during several work sessions, respondent #5 realized, despite their progress, the scope of the problem by saying, "One thing that really surprised me being out in Latimer especially, because I know that's our focus, is how many invasives there are. And how much work still needs to be done...There's still a ton to do."

Respondents discussed how eco-restoration activities can have positive impacts on the local ecosystem in small ways like "to help stop erosion" and "to beautify the area a little" but also in the bigger picture by providing habitat and helping participants realize humans' role in the ecosystem. Respondent #5 described the impact of the work on the food web and on humans.

So by planting these native plants we're providing lots of habitat for birds and butterflies, both migrant and local to live which cascades up the food web. It also conditions the soil to make it better for other plants, native plants, to come in. Also, it connects back to the human aspect of it too. When people restore native woodlands they are really able to get into the nature and appreciate it.

Respondent #3 explained how it is not just those participating in eco-restoration that should become

aware of their role in the ecosystem but that everyone is a part of it, knowingly or not.

You're inextricably linked to the community. Whether you want to be removed or not, you can't help it, especially if you live in a city. Doing things like that remind you that you have a role to play not only as an individual but as a part of a whole.

Respondent #4 described how knowing the importance of the work can add to the sense of accomplishment.

It just felt good to help them, especially knowing how important it was to those guys out there and to her research project. She has all this at stake with it. It's just kind of cool to help them accomplish that. I guess just finishing it would be my best accomplishment.

Respondent #5 described how accomplishing small conservation tasks locally can add up to have a far-reaching impact.

Dunn's Woods and Latimer Woods are both 10-acre woodlands, but if we do our part and everyone's sort of protecting what they have locally that makes a global impact. So even by focusing on what seems like two small urban woodlands in a town that has only 110,000 people, it's still making a difference. It's still important.

Developing a Stewardship Ethic

As described above, respondents reported educational and social benefits of participating in eco-restoration activities. Significantly, respondents were then moved to share this acquired knowledge with others to promote stewardship. Respondents expressed the belief that knowledge is one precursor to stewardship because recognizing the problem may

serve as a motivation for action. As respondent #5 put it:

The more people are educated, the more people know about something like this, the more they're going to want to participate, and the more they're going to want to protect what we have because people get really excited about it.

Respondent #5 was not the only one to describe how knowing a place may also help people develop an emotional attachment that could inspire stewardship. Respondent #2 said,

Knowledge and appreciation of what we do have is really important and understanding the history behind it. Like I said, it becomes a friend of yours, like an old friend that you want to protect. The more people know about that, they'll formulate their own kind of relationship and have that protective feeling over their land.

Respondent #5 revisits the theme of human-nature connections by describing how eco-restoration activities positively impact participants as well as the ecosystem. She explains how this mutually beneficial relationship is essential to stewardship.

They can develop this personal connection that makes a major impact not only on the ecosystem and on the landscape because of their volunteer efforts but also will make an impact on the participants. It can broaden their horizons and open their eyes to new subjects that they aren't as familiar with and it's beneficial to all parties involved.

She later summarized her opinion succinctly by saying, "You protect what you love."

Respondents expressed concern that local natural areas may become vulnerable to development if citizens don't learn about and feel connected

with such areas. As stated by respondent #2, “Without people knowing about it, without the public knowing about it, there is not as many people to protect it. We could lose that. It’s easier to lose.” This respondent went on to say, “Without them having a connection to the landscape or the surrounding areas, the history of the land, it’s easy sometimes for things to get bulldozed over for a parking lot or something.” Respondent #3 supported that claim by expressing gratitude for having Dunn’s Woods on the IU campus. He said, “I think it’s cool they have a little reserved area there for Dunn’s Woods. I’m sure they could put some buildings up there, make money on it. I think it’s cool they reserved that.”

Respondents viewed part of their role as spreading a conservation message to the public. When asked if participating in eco-restoration activities helps achieve the goal of integrating nature into people’s everyday lives, respondent #3 replied, “Probably in a small way. I think probably the bigger part of it...the more helpful thing is to find ways to bring that concept to the general public so everyone can play a role.” Similarly, respondent #2 explained the importance of spreading a conservation message.

Sharing this knowledge I now have of Indiana, you know I’m not an expert, but I have some knowledge. Sharing that with other people who may not have known that information otherwise ever, wouldn’t have never known that, I think that’s important. It’s like one person at a time but it’s something.

These respondents talked about how increasing knowledge in the general public could also lead to changes in attitude and behavior. This might reflect personal experiences as respondent #4 specifically addressed his own pro-conservation behavior saying,

I do love the outdoors. I know it’s important to take care of them. I try to do little things. I try to be energy efficient. Since I live within a few miles of campus I always walk instead of driving, just little things like that.

A Restorative Experience

Spending time in nature can be a restorative experience (Kaplan & Kaplan, 1989; Kaplan, 1995). In this study, two respondents explicitly addressed the psychological benefits of being in the woods and participating in eco-restoration. Respondent #5 explained this through a lens of appreciation by saying, “When people restore native woodlands and are really able to get into the nature and appreciate it, I think that’s really therapeutic.” Respondent #3 discussed how having the woods can provide a mental break.

It would be mentally oppressive to have just buildings everywhere sprawling around you. I like our campus because it’s like, obviously there’s [a lot of] buildings on it, but there’s also a lot of green space too. So you can even reflect, whether you’re actively trying to do so or not, in the woods. You can kind of clear your mind.

Discussion

This study explored the eco-restoration service learning experience of university student-participants in Bloomington, Indiana. Respondents frequently cited key benefits to themselves and to the community. Our results supported previous research such as a study by DiEnno & Thompson (2013) on volunteer motivations that showed a sense of stewardship and an opportunity to learn were important motivating factors. Respondents in this study expressed a desire to learn, share ideas, and engage in meaningful work. Respondents also spoke frequently about how important it was for them to engage with nature, reflecting an important factor identified by Clewell & Aronson’s (2006) study on mo-

tivations. Ryan et al. (2001) posit that continued involvement in volunteer experiences is often a result of social effects. One respondent spoke at length about the benefit of talking to the project leader and fellow volunteers about the work they were doing and about potential future educational and career paths. He stated these social experiences not only contributed to his repeat volunteerism but also to joining the data collection team for an upcoming research project and adding a minor course of study in resource management through the School of Public and Environmental Affairs.

Additional reported benefits also mirrored the literature. Each respondent reported that the work they did was meaningful, felt a sense of accomplishment, and learned about the plants, animals, ecosystem, and impact of their specific tasks. These findings supported the work of Miles et al. (1998) who found that eco-restoration volunteers experienced psychological benefits like sense of accomplishment from engaging in meaningful action, enjoyment, and learning about nature, in addition to the social benefits of meeting and working with new people. Like the respondents in this study, Grese et al. (2000) found volunteers felt satisfied that they were helping the environment and enjoyed learning new things and meeting others. By connecting with the outdoors, socializing, discussing, and reflecting on the experience, most respondents reported a strong emotional connection to the restoration area and a corresponding desire to share their experience with the general public. This finding is consistent with Kals, Schumacher, & Montado's (1999) study on the positive connection between emotional affinity and pro-environmental behavior. They found that spending time in nature can increase affinity for nature which can increase willingness to engage in nature protective behavior.

Respondents in this study described how the work they performed made valuable contributions in preserving the local ecosystem and that they were doing their part to promote global conservation.

Ryan and colleagues (2001) also found that volunteering in eco-restoration projects positively influenced pro-environmental attitudes and behavior. This may have been true for respondents in this study as they all demonstrated pro-environmental attitudes in their interviews but two explicitly described pro-environmental behavior as detailed earlier. However, four of the five respondents were enrolled in courses that stressed conservation and may have already held strong pro-environmental positions. It is unclear to what extent engaging in eco-restoration may have strengthened their positions. Only one respondent addressed this directly saying that the experience "solidified" his pro-environmental attitude. While two respondents did talk about changing their behavior to act in more sustainable ways like walking instead of driving and using less energy, it is not clear if those actions were the result specifically of the eco-restoration project, were attributable to taking the class, a combination of both, or were the result of previously held beliefs.

People can experience restorative benefits by spending time in nature (Kaplan & Kaplan, 1989; Kaplan, 1995), as two respondents reflected in their interview. If simply spending time in nature is restorative, then it stands to reason that engaging in eco-restoration activities in nature may also be restorative. Perhaps the greatest strength of eco-restoration projects demonstrated in this study is that these respondents not only reported positive and, in some cases, restorative experiences but also a strong desire to share those experiences with others, to share knowledge, and to promote stewardship. Service learners in this study reported similar benefits to eco-restoration volunteers in previous studies. Protecting green space through restoration may help ensure others in the community have opportunities for mental restoration, reflection, and recreation.

Limitations

This study was limited by a small sample size and a small number of eco-restoration work-

days. Low response rates to email solicitations were likely a result of the length of time that had passed between the workdays and receiving the email (more than a year in many cases). Additional factors that may have contributed to the low response rate were the fact that some students had graduated and may no longer check their IU email address and the fact that a “cold call” is easy to ignore. Four of the five respondents were enrolled in a biology class with a service learning component while the other respondent was a volunteer at the IURTP. These two types of volunteers had somewhat different experiences as social and educational experiences for those in a class were more formalized than they were for the IURTP participant. This initial pilot study suggests that much of what is described in the literature regarding eco-restoration participant motivation and benefits occurred amongst the eco-restoration service learners we interviewed. This study serves as a basis for further research where researchers can expand the number of respondents by interviewing more new and returning eco-restoration volunteers. As the Bloomington Urban Woodlands Project (BUWP) progresses more service learning classes will participate as well as general students and members of the community. The participants of this study volunteered for a relatively short period of time. Future studies may examine how the experience of regular, long-term volunteers may differ from those who volunteer only a few times. An investigation of how the volunteer experience may differ between service learners, general students, and community members might be useful for practitioners, particularly in understanding the involvement of community members. This study was also unique in that it investigated the long term impacts of service learning and eco-restoration by conducting interviews up to one year after the experience. Future studies may further investigate how long term impacts may differ from short term benefits more commonly examined.

Conclusion

The importance of eco-restoration projects is likely to increase as more and more people are interacting with nature in primarily urban and suburban areas (Dunn et al., 2006) and human impacts continue to disrupt the environment. The focus has long been on the ecological impacts of restoration projects with less emphasis on the role people play and the ways they are impacted. A growing body of literature is focusing more attention on the human aspect of eco-restoration (Hall & Bauer-Armstrong, 2010; Schroeder, 2000). In response to these trends several projects are underway in Bloomington, Indiana. This study explored the potential benefits participants experience during local eco-restoration workdays. Despite a small sample size, this pilot study offers encouraging initial results. All five respondents indicated they had enjoyable experiences and felt the work they did was important, educational, and well worth the time. As these projects progress, researchers have the opportunity to build on this study and further explore the participant experience by interviewing repeat volunteers and community members.

References

- Aronson, J., Blignaut, J. N., Milton, S.J., Le Maitre, D., Esle, K.J., Limouzin, A., et al. (2010). Are socioeconomic benefits of restoration adequately quantified? A meta-analysis of recent papers (2000–2008) in restoration ecology and 12 other scientific journals. *Restoration Ecology* 18, 143–154.
- Barro, S. C. & Dwyer, J. F. (2000). The challenges and opportunities of restoring ecosystems in urban-influenced areas: insights from northeastern Illinois. In: McCabe, R. E., Loos, S. E. (Eds.), *Transactions of the Sixty-fifth North American Wildlife and Natural Resource Conference*. Wildlife Management Institute, Washington D.C, 225-237.
- Bernard, R. (2006). *Research methods in anthropology*

- ogy: Qualitative and quantitative approaches (4th ed.). New York, NY: Alta Mira Press.
- Bixler, R. & James, J. (2005). Environmental socialization: the critical peripheral? In *Handbook of Sustainability Research*. Edited by Filho, W. L. Germany: Peter Lang, 15-30.
- Bloomington Urban Woodlands Project*. (2013). Retrieved December 17, 2013 from <http://www.indiana.edu/~sustain/programs/buwp/index.php>.
- Bruyere, B. & Rappe, S. (2007). Identifying the motivations of environmental volunteers. *Journal of Environmental Planning and Management*, 50(4), 503-516.
- Burls, A. (2007). People and green spaces: promoting public health and mental well-being through ecotherapy. *Journal of Public Health*, 6(3), 24-39.
- Clary, E. G., and Snyder, M., (1999). The Motivations to volunteer: Theoretical and practical considerations. *Current Directions in Psychological Science*, 9(5), 156-59.
- Clewell, A. F., & J. Aronson. (2013). *Ecological restoration: Principles, values and structure of an emerging profession*. Washington, DC: Island Press.
- Creswell, J. (2007). *Qualitative inquiry and research design: Choosing among five approaches*. 2nd ed. Thousand Oaks, CA: Sage.
- Davenport, M. A., Bridges, C. A., Mangun, J. C., Carver, A. D., Williard, K. W. J., & Jones, E. O. (2010). Building local community commitment to wetlands restoration: a case study of the cache river wetlands in southern Illinois, USA. *Environmental Management*, 45, 711-722.
- DiEnno, C. M., & Thompson, J. L. (2013). For the love of the land: How emotions motivate volunteerism in ecological restoration. *Emotion, Space and Society*, 6, 63-72.
- Dunn, R. R., Gavin, M. C., Sanchez, M. C., & Solomon, J. N. (2006). The pigeon paradox: dependence of global conservation on urban nature. *Conservation Biology*, 20(6), 1814-1816.
- Egan, D., Hjerpe, E. E., & Abrams, J. (Eds.) (2011). *Human Dimensions of Ecological Restoration: Integrating Science, Nature, and Culture*. Washington, D.C.: Island Press.
- Fisher, B., Turner, R. K., & Morling, P. (2008). Defining and classifying ecosystem services for decision making. *Ecological Economics*, 68 (2009), 643-653.
- Grese, R. E., Kaplan, R., Ryan, R. L., & Buxton, J., (2000). Psychological benefits of volunteering in stewardship programs. In *Restoring Nature: Perspectives from the Social Sciences and Humanities*, edited by Gobster, P. H., & Hull, R. B., Washington, DC: Island Press, 265-80.
- Hall, R. & Bauer-Armstrong, C. (2010). Earth partnership for schools: Ecological restoration in schools and communities. *Ecological Restoration*, 28(2), 208-212.
- Higgs, E. (2003). *Nature by design: People, natural process, and ecological restoration*. Cambridge, MA: The MIT Press.
- Kals, E., Schumacher, D., & Montado, L. (1999). Emotional affinity toward nature as a motivational basis to protect nature. *Environment and Behavior*, (31)2, 178-202.
- Kaplan, S. (1995). The restorative benefits of nature: toward an integrative framework. *Journal of Environmental Psychology*, 15, 169-182.
- Kondolf, G. M., Mazingo, L. A., Kullmann, K., McBride, J. R., & Anderson, S. (2013). Teaching stream restoration: Experiences from interdisciplinary studio instruction. *Landscape Journal*, 32(1), 95-112.
- Lee, J. W. (2005). Foreword. Ecosystems and human well-being: health synthesis. Retrieved on December 16, 2013 from

- <http://www.who.int/globalchange/ecosystems/ecosystems05/en/index.html>
- Leigh, P. (2005). The ecological crisis, the human condition, and community-based restoration as an instrument for its cure. *Ethics in Science and Environmental Politics*, 2005, 3-15.
- Miles, I., Sullivan, W. C., & Kuo, F. E. (1998). Ecological restoration volunteers: the benefits of participation. *Urban Ecosystems*, 2(1), 27-41.
- Moustakas, C. (1994). *Phenomenological Research Methods*. Thousand Oaks, CA: Sage.
- O'Brien, L., Townsend, M., & Ebdon, M. (2010). 'Doing Something Positive': Volunteers' Experiences of the Well-Being Benefits Derived from Practical Conservation Activities in Nature. *Voluntas: International Journal of Voluntary and Nonprofit Organizations*, 21(4), 525-545.
- Purcell, A. H., Corbin, J. D., & Hans, K. E. (2007). Urban riparian restoration: an outdoor classroom for college and high school students collaborating in conservation. *Madroño*, 54(3), 258-267.
- Riddick, C. & Russell, R. (2008). *Research in Recreation, Parks, Sport, and Tourism*. 2nd ed. Champaign, IL: Sagamore Publishing.
- Ryan, R. L. (2005). Exploring the effects of environmental experience on attachment to urban natural areas. *Environment and Behavior*, 37(3), 3-42.
- Ryan, R. L., Kaplan, R., & Grese, R. E. (2001). Predicting volunteer commitment in environmental stewardship programmes. *Journal of Environmental Planning and Management*, 44(5), 629-648.
- Schaefer, V., & Gonzales, E. (2013). Using problem-based learning to teach concepts for ecological restoration. *Ecological Restoration*, 31(4), 412-418.
- Schroeder, H. W. (2000). The restoration experience: Volunteers' motives, values, and concepts of nature. In *Restoring Nature: Perspectives from the Social Sciences and Humanities*, edited by Gobster, P.H. & Hull, R.B., Washington, DC: Island Press, 247-64.
- Stebbins, R. A. (2010). Inclination to participate in organized serious leisure: An exploration of the role of costs, rewards, and lifestyle. *Leisure/Loisir*, 29(2), 183-201.
- Tidball, K. G., and Stedman, R. (2013). Positive dependency and virtuous cycles: from resource dependence to resilience in urban social-ecological systems. *Ecological Economics*, 86, 292-299.
- van Marwijk, R., Elands, B., Kmpen, J.K., Terlouw, S., Pitt, D.G., & Opdam, P. (2012). Public perceptions of the attractiveness of restored nature. *Restoration Ecology*, 20(6), 773-780.
- Wilson, E. O. (1984). *Biophilia*. Cambridge, MA: Harvard University Press.