

Predicting Volunteer Commitment in Environmental Stewardship Programmes

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ABSTRACT *The natural environment benefits greatly from the work of volunteers in environmental stewardship programmes. However, little is known about volunteers' motivations for continued participation in these programmes. This study looked at the relationship between volunteer commitment and motivation, as well as the effect that volunteering has on participants' behaviour and attitudes toward the environment. The study participants were 148 long-term volunteers from three environmental stewardship programmes in Michigan. The results of the study revealed that helping the environment and learning were important initial motivations. Other motivations, including social factors and project organization, were found to be significant predictors of volunteer commitment. Volunteers also indicated many significant changes in their environmental outlook and actions during their involvement in stewardship activities. The results of the study suggest that stewardship programmes that consider volunteers' changing motivations at different stages of their participation can effectively nurture personal growth while fostering a powerful constituency for the environment among their volunteers.*

Introduction: The Reciprocal Relationship between Volunteers and the Environment

The environmental movement would not exist without the help of thousands of dedicated volunteers. Both public and private environmental organizations rely on unpaid volunteers to further the cause of protecting and helping the imperilled natural environment. Many such ecological restoration efforts, in particular, rely on volunteers to restore degraded natural habitats. For example, in 1996 the Nature Conservancy's Volunteer Stewardship Network in Illinois alone estimated that over 5600 volunteers dedicated almost 57 000 hours to cleaning or maintaining more than 67 000 acres (27 000 ha) of natural areas (Ross, 1997). Similar environmental stewardship programmes are being established across North America. Volunteers help to build and maintain trails, restore ecosystems by clearing exotic plant species and planting native species, monitor and identify endangered species and their habitats and publicize the environmental message through newsletters, workshops and demonstration projects. The environment has benefited enormously from the work of volunteers; in fact, one might say

that many of the improvements in environmental quality over the past three decades have been made by volunteers.

While the environment benefits from volunteers' work, do volunteers draw any benefits from their involvement in environmental stewardship projects? Why would people spend their free time cutting brush during the cold, Mid-western winter, or painstakingly collecting prairie seeds on a blistering summer day? Why might they stand waist deep in an icy stream to monitor oxygen levels or collect aquatic invertebrates? Perhaps the novelty of these experiences is a draw. Some volunteers, however, have been involved in these activities over a long period of time. What motivates longevity in volunteering for stewardship programmes?

Programme organizers need a cadre of dedicated volunteers to sustain an environmental restoration programme. Many organizations do not have the funding to hire a large staff to carry out their work, so volunteers provide the majority of the labour force, saving these environmental organizations a considerable amount of money. However, programme organizers need to be assured that volunteers can be depended upon to show up for work days or to help with newsletter mailings. Retaining volunteers is essential, because it lessens the amount of recruiting and training that project organizers must undertake. In fact, dedicated volunteers are often utilized for recruiting and training new volunteers. Understanding people's motivations for long-term volunteering would thus be valuable information for programme organizers looking to build and maintain their volunteer resources.

Review of Volunteer Motivations

Since relatively little research on volunteer motivations has been conducted in the environmental arena, a review of research in other areas, such as social services, may help illuminate this discussion. Studies of volunteers in social services have shown that one of the most important motivations is doing something worthwhile (Cnaan & Goldberg-Glen, 1991). Gaining educational experience also proved to be an important motivation for participation in volunteer activities.

Knoke (1981) suggested that being part of the decision-making process enhances volunteers' commitment and, conversely, lessens the likelihood of volunteers leaving the organization. A study of acquired immune deficiency syndrome (AIDS) volunteers, however, found that long-term volunteering was not associated with integration into the volunteer organization (Omoto & Snyder, 1995). It would be interesting to know if this same result holds true for participants in environmental restoration projects. This is especially important, because many ecological restoration projects, such as the Volunteer Stewardship Network organized by the Nature Conservancy, operate on the premise that volunteers need to be empowered participants in the volunteer organization (Ross, 1994).

People's motivations for volunteering may change over time. In studies of college students' participation in service organizations (Winniford *et al.*, 1995) and volunteers in AIDS programmes (Snyder & Omoto, 1992; Omoto & Snyder, 1995), altruism was shown to be an important motivation initially for volunteering. However, more self-interested motivations, such as social interactions (e.g.

existing friendships or the desire to make new friends), became more important for continued participation in these volunteer efforts.

A review of the few studies that have focused on volunteer motivations for participation in environmental stewardship activities reveals several key themes. Helping the environment was found to be a strong motivation for urban forestry volunteers (Westphal, 1993, 1995; Still & Gerhold, 1997) and stream monitoring volunteers (Roggenbuck *et al.*, 2000). Helping the environment may be akin to the altruism that initially motivates volunteers in social service activities. In the context of ecological restoration projects, it would be particularly useful to know if the motivation to help the environment remains strong over time. These projects require long-term commitment to a specific place. Having volunteers who have personally experienced the transformation of a particular landscape may be especially useful to the organizations involved.

In a study based on content analysis of newsletters of environmental restoration volunteer groups, Schroeder (1998) found that helping the environment was an important motivation for volunteering. Volunteers described the destruction of natural areas by urban development as an important catalyst for initially becoming involved in these programmes. In addition, volunteer restoration projects provide volunteers with the opportunity to see direct, tangible results from their efforts. For example, after clearing invasive shrub species from a forest, volunteers are able to observe an increase in the native spring wildflowers.

A study of volunteers in five ecological stewardship groups in Michigan and Ohio, which was conducted by the authors (Grese *et al.*, 2000), supports Schroeder's (1998) findings. The results revealed that volunteers were highly motivated by a desire to help the environment and to learn new things as part of their volunteer efforts. Social and spiritual motivations appeared to be less important factors in these groups.

In the only other large-scale study of ecological restoration volunteers, Miles *et al.* (1998) found that volunteers expressed a range of benefits from their participation. The most important benefit involved the opportunities that volunteer stewardship projects provided to take 'meaningful action'. This factor centred on more general altruistic notions, such as 'causing good things to happen' and 'being useful'. Another important benefit was 'fascination with nature', which acknowledged the fascinating qualities of nature and the wonder of learning how nature works. An important part of the study was to determine if these benefits changed over time as volunteers became more experienced. The study found no effect for volunteer duration, but did find that frequency of volunteering was related to benefits. Those who volunteered more frequently indicated a higher satisfaction with the benefits of volunteering.

In a recent study of Save Our Stream volunteers, Roggenbuck *et al.* (2000) found several reasons why volunteers became involved in this programme, including protecting the environment, learning and nature enjoyment. The last category revealed that volunteering in a natural setting offers participants the chance to reflect. A variation on this reflection theme was also found by Grese *et al.* (2000).

A study that compared active volunteers and inactive volunteers (i.e. those who no longer participate) in an environmental stewardship group in Toronto's Don River watershed found that active volunteers were significantly more likely to have friendships in the group (i.e. social motivations), participate in other

environmental groups and use the volunteer sites for recreation (Donald, 1997). Furthermore, active volunteers felt a stronger emotional connection to the environment than did non-active volunteers. Donald (1997) attributes these differences to changes that occurred to volunteers as a result of their volunteer activities.

Proponents of ecological restoration work have identified volunteering as one way to educate the public about natural areas (Flebbe, 1996). In fact, some ecological restoration projects, such as those carried out at the University of Wisconsin–Madison Arboretum, emphasize educating team leaders and volunteers as a way of creating advocates for environmental restoration (Bader & Murray, 1997). Fortunately, it also appears that volunteers themselves are motivated to learn more about nature as part of their volunteer activities (Grese *et al.*, 2000). However, it is still not known if participation in volunteer stewardship activities does indeed create the changes in participants' attitudes and outlooks toward the environment that project organizers hope for.

Factors that May Be Key to Continued Participation

In summary, several factors may motivate longevity in volunteering: learning; helping the environment; social factors; reflection; and project organization. These factors derived from the literature and our previous studies (Grese *et al.*, 2000) are the focus of the current study.

Volunteer restoration activities can teach people about the natural environment. Long-term volunteers may be motivated by the continued learning that they experience from their volunteer activities.

Environmental stewardship projects differ from activities offered by many other environmental groups in that they give volunteers the opportunity to see improvements to the environment that are the direct result of their work. For example, clearing brush to restore a prairie or savanna may provide more immediate, tangible results than working to address more overwhelming environmental issues, such as air quality or global warming. Therefore, the tangible way in which stewardship projects help the environment may be an important motivation for volunteering.

Volunteers may also be drawn to the social benefits provided by participation in stewardship activities. Volunteering may provide the opportunity to meet new people who share the same environmental interests. This social dimension may be an important initial reason to begin volunteering, while the commitment to help the environment that comes from participation may be the reason to stay involved.

Nature can be a constant source of fascination (Kaplan & Kaplan, 1989; Miles *et al.*, 1998). Natural environments allow people the chance to reflect and to explore parts of local preserves they might not otherwise encounter. The patterns of leaves, moving water, the still of a forest glade and the seasonal cycles of flowers in a prairie are examples of nature's beauty that allow people to ponder the larger issues in life. Volunteer activities that occur in these natural settings may give people this chance to reflect. We might conjecture that volunteers are more aware of this motivation after they have been volunteering for a while.

Finally, the organization of the volunteer programme itself may have some influence on volunteer motivations. Programmes that are disorganized or spor-

adic may discourage volunteers from continuing their efforts. On the other hand, well organized programmes that allow volunteers to become involved in decision making and host frequent work opportunities may be more appealing to volunteers. Long-term volunteers may be motivated to become more involved in organizing projects, as suggested by Knoke (1981).

From this group of factors (i.e. learning, helping the environment, social factors, reflection and project organization), we designed a study to understand how these factors relate to long-term volunteering. This study involved volunteers in three environmental preservation organizations in Michigan. Volunteers in these organizations were the focus of our earlier study on volunteer motivations (Grese *et al.*, 2000). However, in order to ensure the anonymity of participants, no records were kept of participants' names. We have no way to determine if some of the participants had also responded to a survey in our previous study. However, since the study was conducted 3 years earlier and most participants had not yet been involved with these programmes, if there is any overlap in the two samples it is likely to be minimal. Since we were especially interested in the benefits that long-term volunteers felt they received from their work, we targeted the survey to those who had volunteered for at least 1 year with their respective organizations.

Methods

Study Participants

The study participants were 148 volunteers in three ecological stewardship programmes: the Adopt-A-Stream programme of a watershed council ($n = 88$); the natural areas division of a municipal parks department ($n = 35$); and the state chapter of a national conservation organization ($n = 25$). The volunteers were involved in a variety of activities. The Adopt-A-Stream volunteers monitor stream quality and map local riparian ecosystems. Their work includes monitoring stream health by taking water quality samples, collecting aquatic invertebrates and assessing the riparian corridor. After the initial training, the majority of this work is done by individuals or small groups. Sometimes this work also involves removing rubbish and other debris from the streams. Volunteers for the latter two groups are involved mostly in the ecological restoration of terrestrial ecosystems, such as prairies, fens and forests. The work with the natural areas programme of the parks department was at local sites, while the work efforts from the conservation organization were at various sites across the state. The work for both of these groups primarily involves removing invasive non-native plants through cutting and burning, and collecting native plant seeds. In general, this ecological restoration work is done as part of a group work day. The programmes varied in work opportunities and frequency. Some efforts, such as inventories (plants, birds, butterflies or amphibians) and prescribed burning, require special training by the organization. Some of the volunteers also help out with administrative tasks, such as office work, letter writing and newsletter distribution.

The survey sample was limited to volunteers who had participated in the programmes for more than 1 year. A list of volunteers who fitted this selection criterion was provided by the respective programmes. Overall, 310 surveys were distributed by mail to volunteers in the three programmes, and 150 surveys were

returned. However, two participants volunteered with more than one programme, so their responses were not included when making group comparisons. This dropped the number of usable surveys to 148 surveys for an overall response rate of 48%.

On the basis of the demographic information provided by the respondents, it was established that they generally lived relatively close to their volunteer sites, with over half residing within 5 miles. The sample ranged in age from under 30 years (14%) to 60 years and older (14%), with the median age group in their 40s. The study sample was divided almost evenly between men and women.

Survey Instrument

The same four-page survey was sent to all participants with a cover letter explaining our interest in stewardship and other volunteer activities and a postage-paid return envelope. The first few questions, in an open-ended format, concerned the respondent's volunteer activities: when these began; frequency of participation; involvement in other groups; and reasons for dropping out of any volunteer programmes in the past. Most of the remaining questions involved structured items with 5-point rating scales. These questions focused on the following constructs.

- *Motivations for continued participation.* The list of 19 reasons for or benefits from participation included items relating to learning, helping the environment, social and recreational benefits, reflection and project organization. Approximately one-third of these items were derived from our earlier study of volunteer stewardship activities (Grese *et al.*, 2000). The remaining items were developed to broaden our understanding of volunteer motivations that we had discovered through a review of the literature and in our conversations with volunteers.
- *Change in environmental outlook.* In order to learn whether stewardship activities might transform the volunteer's outlook or activities, the survey included the question "Over the past few years, how much have your outlook and actions toward the environment changed?" The 27 items tapped topics such as knowledge about the natural environment, attachment to natural areas and appreciation for natural areas, as well as changes in actions toward the environment, such as becoming an advocate for the environmental movement (i.e. writing letters and attending meetings, etc.), involving natural areas and volunteering as part of one's recreation or vacation plans and developing native habitats in one's own yard. For these items the rating scale categories were 1 = much less, 3 = about the same and 5 = much more.
- *Attachment to natural areas.* Using the notion that attachment may be most apparent when a place changes, this question asked participants what their response would be should decisions be made that negatively changed the natural area where they volunteered. These seven items (derived from Ryan (1997)) included emotional responses (e.g. feeling a sense of loss), increased environmental activism and relocating one's volunteer and recreation activities to another natural area.
- *Expertise.* The survey included 10 knowledge or experience domains (e.g. native plants, natural areas management and water quality monitoring) and

asked participants to rate each in terms of their level both when they began volunteering and at the present time.

- *Level of activity.* Interviews with programme organizers indicated that volunteers participated in activities ranging from wildlife and bird counts to brush removal and rubbish clean-up. Participants were asked to indicate their level of activity with respect to 11 specific kinds of stewardship efforts.
- *Commitment.* The survey included three items to gauge the strength of commitment to the volunteer efforts: the degree to which volunteering was a high priority; whether their participation depended on time or activity; and how regularly they volunteered.

The survey also included demographic variables such as age and gender as well as distance to volunteer site and length of residence.

Data Analysis

For most of the major constructs, principal axis factor analysis with varimax rotation and pairwise deletion of missing data was used for data reduction. We used the following criteria for scale construction: eigenvalues greater than 1.0; factor loading greater than 0.45; and exclusion of items with loadings greater than 0.45 on two or more factors unless the loadings were separated by at least 0.20. In addition, factors needed to have an α coefficient of at least 0.75 (except where noted).

As the study entailed a large number of independent variables, linear multiple regression analyses were used to determine their contribution in explaining each of the dependent variables.

Results and Discussion

What Constitutes Ongoing Volunteering?

We were interested in looking at volunteers in terms of how long they had served, how frequently they volunteered and also how strongly committed they were to these activities. The strength of commitment was assessed by combining ratings of two items: 'volunteer on a regular basis' and 'volunteering is a high priority for me' (Cronbach α of 0.74).

The duration of volunteering ranged widely: although about one-third (30%) had volunteered for 1 year, some had volunteered for as long as 20 years. Two years was the median length of time that participants had volunteered with their respective programmes. For the purposes of analysis, duration was coded as a 5-point scale, with the highest level for those who had volunteered for 6 years or more.

Frequency of volunteering also had a large variation. On average, participants volunteered three times per year, although 20% volunteered only once a year and 20% as often as once a month. Frequency of volunteering was also converted to a 5-point scale, with 12–144 times a year coded as 5.

Frequency and volunteer commitment were highly correlated ($r = 0.61$). Duration, on the other hand, was not correlated with frequency or commitment. This result suggests that volunteer commitment is more related to the frequency of participation than to the length of time that the volunteer has been participating in a programme. For volunteer stewardship co-ordinators, this result may

suggest that the goal for volunteer retention is not to maintain volunteers over a long period of time, but to increase the frequency with which people can participate within a programme. Having regular and frequent volunteer opportunities may be important for building commitment.

What Factors Lead to Ongoing Volunteering?

Participants' ages, how far they travel to their volunteering site and whether their volunteering depended on having time or on the specific activity were all not related to their commitment or frequency or duration of volunteering.

By contrast, expertise and type of participation were related to ongoing volunteering. Participants were asked to indicate their 'experience/knowledge' of each of 11 domains (e.g. invasive species, natural history of the area and wildlife habitats/mapping), both when they began volunteering and currently. While we intended to look at the ratings separately in terms of time and to divide the different kinds of experiences into categories, the correlations between all these items were too high to create meaningful separate measures. Hence the single 'expertise' score combines the ratings across experiences and the two times (based on a 5-point scale where 5 = high level of expertise).

Factor analysis of the question "How often do you participate in the following volunteer stewardship efforts?" led to three themes with α greater than 0.70. The native plant restoration theme included 'invasive species control', 'brush removal' and 'trail construction/maintenance'. The stream theme consisted of 'stream quality monitoring' and 'ecosystem or stream mapping'. The clean-up theme included 'trash' and 'stream' clean-up activities. Correlations between expertise and the three activity measures were all less than 0.35.

Participation in native plant restoration and stream activities as well as the expertise index accounted for a substantial amount of the variance (31%) in commitment (Table 1). Native plant restoration and stream activities were also significant predictors of frequency of participation. By contrast, longer duration of volunteering was related to participation in clean-up activities as well as greater experience or knowledge ($R^2 = 0.17$).

The results in Table 1 indicate that the two more proactive activities, related to stream and native plant restoration, are stronger factors in frequency of participation and strength of commitment. These activities may be seen as more engaging than clean-up activities, often allowing participants to develop their

Table 1. Experience and activities as predictors of commitment

Predictor (β coefficients)	Commitment	Frequency	Duration
Expertise	0.26	—	0.32
Native plant restoration	0.46	0.30	—
Stream	0.36	0.28	—
Clean-up	—	—	0.20
R^2	0.31	0.16	0.17
F	12.97	5.63	6.53
p	0.001	0.001	0.001

skills in identifying native plant or aquatic species. The clean-up activities showed a stronger association with duration, reflecting the fact that such efforts have been part of volunteer programmes for a longer period of time for the organizations in our study. The role of knowledge or expertise as a significant factor in both commitment and duration suggests that the investment in learning increases the desire to continue to volunteer. At the same time, increased participation is likely to foster further learning and understanding about the environment.

Reasons for Volunteering

As discussed earlier, we hypothesized that volunteers’ motivations for continued participation in environmental stewardship programmes may centre around particular themes. Factor analysis of the 19 items related to reasons for volunteering yielded five factors (Table 2). The Cronbach α coefficients of internal reliability ranged between 0.75 and 0.80.

The motivations given the highest ratings centred around two themes, helping the environment (mean = 4.09) and learning (mean = 3.98). The two items constituting helping the environment suggest tangible rewards that are unique to environmental stewardship. In a content analysis of volunteer newsletters, Schroeder (1998, 2000) also found the tangible results of ecological restoration work to be an important motivation for volunteers.

Table 2. Motivations for continued participation: factor solution

	Cronbach α	Mean	Standard deviation
Helping the environment	0.79	4.09 ^d	1.02
Seeing improvements to the environment			
Helping to restore natural areas			
Learning	0.77	3.98 ^d	0.89
Nature observation			
Learning about specific plants/animals			
Learning new things	0.75	3.26 ^b	0.92
Project organization			
Projects are well organized			
Feeling needed			
Knowing what is expected of me			
Working with a good leader	0.79	3.14 ^{b,c}	0.95
Social			
Seeing familiar faces			
Meeting new people			
Having fun	0.80	3.05 ^c	0.80
Reflection			
Having a chance to reflect			
Opportunities to work at my own pace			
Doing something physical			
Feeling peace of mind		4.39	2.10 ^{b,c}
Individual items			
Feeling of doing something useful			
Making decisions about projects			

Note: Same superscripts are not significantly different at $p < 0.05$.

The second theme, learning, was related to the opportunities that volunteering provides for learning new things, such as understanding more about specific plants and animals. A similar factor related to learning new things was also a highly rated motivation in our earlier study (Grese *et al.*, 2000). This was especially true for those who indicated a greater expertise with wildlife habitats and species identification. Thus, it appears that the opportunities for exploration provided by volunteer stewardship programmes continue past one's initial volunteer experience and are perceived to be an ongoing benefit.

The third highest motivation category involved the project organization (mean = 3.26). Individual items revealed that volunteers are concerned that 'projects are well organized' and that they have the opportunity of 'working with a good leader'. Furthermore, volunteers need to be clear about what is expected of them. This factor shows that characteristics of a well run volunteer programme (i.e. organization, leadership and communication) can be critical to encouraging continued participation by volunteers.

The next category, with a mean of 3.14, relates to the social motivations for volunteering. The individual items in this category include 'seeing familiar faces', 'meeting new people' and 'having fun'. Thus, while volunteers may be working to help the environment, the social benefits of meeting new people and developing a core group of repeat volunteers are important to their experience.

The final category involves personal or emotional benefits from volunteering that we call reflection. We felt that this motivation might come from the intimate contact with nature which is provided by environmental stewardship programmes. This factor included items such as 'having a chance to reflect' and having 'opportunities to work at my own pace'. One reason for the relatively low score for this factor (mean = 3.05) may be that volunteer activities are generally carried out in a social context which may be less conducive to contemplation.

The empirically derived factors incorporated all but two items. One of these was the item with the highest mean (4.39), 'feeling of doing something useful'. Although related to the category of helping the environment, it reflects a motivation that is perhaps less tangible and more altruistic. The other item was the lowest-rated, 'making decisions about projects' (mean = 2.10). While volunteers may be interested in participating in a well run programme, they are not necessarily motivated to run the programme themselves. This insight runs counter to much of the volunteer literature (Knoke, 1981) that suggests that volunteer programmes can retain volunteers by integrating them into leadership positions.

Motivations that Predict Commitment

While the five motivation factors provide useful insights about reasons for volunteering, they do not directly address the question of what motivates committed volunteers. To examine this question, multiple regression analysis was used with the five motivation factors as independent variables and the commitment index as the dependent variable. Two of the five motivation factors were significant positive predictors of commitment to volunteering, while one was a negative predictor ($R^2 = 0.17$). The results (Table 3) indicate that those who were more oriented to social reasons for volunteering and for whom project organization played an important role were more likely to consider volunteering

Table 3. Motivation factors as predictors of commitment

Predictors (β coefficients)	Commitment
Project organization	0.33
Social	0.20
Learning	-0.23
Helping the environment	—
Reflection	—
R^2	0.17
F	5.06
P	0.001

a frequent, high-priority activity. Perhaps less expected was the negative relation between the importance of learning as a benefit of volunteering and commitment ($\beta = -0.23$). In other words, for this group of participants, strong commitment was not driven by a strong desire to learn more, but rather related to a well run organization and a sense of feeling needed as well as the social dimensions of volunteering.

Neither the reflection nor the helping the environment theme was a significant predictor of volunteer commitment. Furthermore, the motivation factors were not significant predictors of either frequency or duration of volunteering.

The negative relationship between the desire to learn more about natural areas and volunteer commitment makes sense when one considers that expertise was also a strong predictor of commitment. Those who already consider themselves to be more expert in their knowledge and skills of natural areas may be less motivated to learn new things as part of their volunteer activities. This pattern of findings would suggest an important opportunity for volunteer organizations to use effectively the experienced volunteers' greater knowledge while at the same time fostering their social needs. For example, asking those with more knowledge to help newer volunteers with plant identification would acknowledge their greater expertise, give them some recognition in front of the group and enhance their sense of feeling needed.

The three motivation factors that were related to commitment showed no relationship with the participants' choice of activities. By contrast, the other two motivation factors, helping the environment and reflection, which were not related to commitment, were both significantly related to the activities to which participants devoted most time. Both individuals who spent their time on native plant restoration and those engaged in clean-up activities were more likely to indicate helping the environment and reflection as motivations. It could be that these activities provide more 'visible' benefits to the environment and give participants a more tangible proof of the way in which their work has helped the environment.

Changes in Environmental Outlook and Actions

It has been suggested by some proponents of volunteer stewardship programmes (Jordan, 1989; Ross, 1994) that involvement in ecological restoration builds a stronger connection between people and the environment. In addition,

Leopold (1949) suggested that human involvement in restoring or healing nature might develop a much needed environmental ethic. On a more personal level, volunteer restoration activities involve a close, active relationship with a specific natural area. This relationship may create an emotional connection, or attachment, between people and a specific natural area (Ryan, 1997; Schroeder, 1998). Our study looked at whether participation in stewardship activities resulted in any transformations in volunteers' lives beyond the immediate task. More specifically, did long-term volunteering have any impact on volunteers' outlook and behaviours? Furthermore, were these changes in outlook and behaviour related to their reasons for volunteering and commitment to it?

Participants in the study were asked how much their outlook and actions toward the environment had changed over the past few years. They were asked to use a 5-point Likert scale, where 1 = much less, 3 = about the same and 5 = much more. The 27 items in this measure were analysed using factor analysis. The resulting categories revealed four themes or factors relating to changes in volunteers' outlook and actions (Table 4).

Table 4. Changes in volunteers' environmental outlook and actions: factor solution

	Cronbach α	Mean	Standard deviation
Creating native landscapes	0.78	3.86 ^c	0.53
Landscape with native plants			
Help protect native landscapes wherever they may occur			
Create backyard wildlife habitats			
Recognize specific plants/animals			
Recognize unhealthy landscapes			
Discourage my friends and neighbours from using invasive exotic species			
General natural area appreciation	0.84	3.61 ^b	0.57
Visit natural areas and preserves			
Enjoy myself in the outdoors			
Take vacations in natural areas			
Feel at home in natural areas			
Explore new areas within nearby parks and preserves			
Consider volunteer activities as part of my recreation			
Attachment to volunteer site	0.64	3.52 ^{a,b}	0.79
Would miss my volunteer site if I moved away			
The natural area where I volunteer has become one of my favourite places			
Environmental activism	0.62	3.50 ^a	0.57
Write letters about environmental issues			
Interest in protecting natural areas nationally			
Tell my friends about environmental issues			
Discouraged about environmental degradation			
Individual items			
Developed an attachment to local natural areas		3.91 ^c	
Interest in protecting <i>local</i> natural areas		4.16	

Note: Same superscripts are not significantly different at $p < 0.05$.

The most significant transformation in volunteers' lives was that they were creating native landscapes in their own gardens (mean = 3.86). Individual items in this theme related to 'landscape with native plants' and 'creating backyard wildlife habitats'. The effect also extended beyond one's own yard and included helping to 'protect native landscapes wherever they may occur'. The creating native landscapes factor also involved having the knowledge to recognize specific plants and animals, including 'unhealthy landscapes'.

The other three factors, though thematically distinct, were similar in their mean ratings (between 3.50 and 3.61). The first of these categories dealt with an increase in general natural area appreciation. This category had a recreational component, including an increase in visits to natural areas and preserves, enjoyment of the outdoors and vacationing in natural areas. Interestingly, this theme also included an item which related volunteer activities themselves to recreation. This result corroborates the preliminary findings of our earlier study (Grese *et al.*, 2000), in which volunteers' motivations for participation in volunteer activities paralleled their motivations for participation in recreation activities.

The next theme reflects participants' attachment to their volunteer site. The two items comprising the factor deal with the volunteering site becoming a favourite place and the perceived sense of loss if moving from the area. Interestingly, an item which did not factor with this category, 'developed an attachment to local natural areas', was rated significantly higher (mean = 3.91). This result suggests that volunteer restoration activities may be more important in developing an attachment to local natural areas in general rather than specifically to one's volunteer site. This finding is supported by the studies of one of the authors (Ryan, 1997, 2000), in which volunteers were found to have more of a conceptual attachment to natural areas in general rather than to their specific volunteer site.

The fourth category of changes in volunteers' outlook and behaviours focused on becoming more involved in environmental activism, in a broader sense. Items in this category included writing letters and telling friends about environmental issues, as well as having an increased 'interest in protecting natural areas nationally'. By contrast, an item about 'interest in protecting local natural areas' received the highest endorsement of any of the items (mean = 4.16) and was not included in this factor. The strong increased interest at the local level is reinforced by the frequent requests by volunteers to be shown other local natural areas where groups are working. These volunteers seem very committed to supporting the general protection of natural areas locally and want to know where these places exist.

These results show that volunteer stewardship activities have an impact on participants' appreciation of and advocacy for local natural areas. This is an important finding, because efforts to preserve local natural areas often get overshadowed by the more 'glamorous' efforts to protect the rainforest and other distant, endangered landscapes. This research supports the claims of restoration advocates, such as Jordan (1989), who have proposed that restoration projects play a vital role in reconnecting people to their local natural areas.

Attachment to the Volunteer Site

The results discussed in the previous section show that over the past few years, some participants have developed an attachment to the natural areas where they

Table 5. Volunteers' attachment to their volunteer sites as measured by response to hypothetical change: factor solution

	Cronbach α	Mean	Standard deviation
Personal loss	0.78	4.17	0.79
Experience some sense of loss			
Feel a reduction in quality of life			
Environmental advocacy	0.73	4.00	0.83
Become involved in preserving remainder of this place			
Strongly protest changes			
Substitute this place	0.74	3.25	0.99
Look for another nearby natural area in which to <i>recreate</i>			
Look for another nearby natural area in which to <i>volunteer</i>			
Stop visiting this place			

participate in stewardship activities. However, it also appears that participants were even more likely to indicate that they had developed an attachment to local natural areas in general. If, indeed, participation in volunteer stewardship activities helps to build a connection between people and local natural areas, what are the characteristics of this attachment to place? How strong is volunteers' attachment to their volunteer sites and what manifestations does it have in their feelings and actions?

The dimensions of attachment were assessed by posing a question about environmental change (Ryan, 1997). Participants were asked to indicate their response (on a 5-point Likert scale, where 1 = not at all and 5 = very much) should decisions be made that changed the natural area where they volunteered in a negative manner. Factor analysis of the list of possible responses to this hypothetical situation revealed three categories (Table 5). The most highly rated factor (mean = 4.17) involved two items reflecting personal loss, 'experience some sense of loss' and 'feel a reduction in quality of life'. The second category revealed that volunteers' attachment to their sites also has the potential to spur them into environmental advocacy. This highly rated category (mean = 4.00) included items related to taking action, such as protesting negative changes to their natural area and becoming involved in preserving the remaining undisturbed sections of it. The third category involved the idea that if a place changes drastically, people may look for another place to recreate or volunteer. This factor, substitutability of this natural area, was rated significantly lower (mean = 3.25) than the other two factors, indicating that participants were more likely to take action to protest negative changes to their natural areas rather than to look for another natural area to recreate or visit.

The results of this measure show that volunteers do indeed have a strong attachment to their volunteer sites, which appears to be a result of their volunteer efforts, and, furthermore, that this attachment is manifested in both personal feelings for these natural areas and a readiness to defend them from negative changes.

Does Commitment Relate to Volunteers' Environmental Outlook and Attachment?

It would be reasonable to expect that continued participation in volunteer stewardship activities would have an impact on volunteers' outlook and behaviour. To examine these relationships, multiple regression analyses were conducted using as outcome variables the factors based on environmental outlook and responses to a potential negative change. Since the commitment measure and frequency of participation were strongly correlated, they were not included in the same regression analysis. Rather, separate analyses were carried out using either commitment and duration or frequency and duration as the predictors. One of the analyses of the outlook and action factors was significant, showing that commitment (and not frequency) was strongly predictive of attachment to the volunteer site ($R^2 = 0.19$, $F = 12.66$, $p < 0.001$). Thus, more committed volunteers felt that their volunteer site was one of their favourite places and that they would miss it if they moved away.

The analyses examining volunteers' attachment as measured by their responses to a hypothetical, negative change to their volunteer site revealed that duration was a significant predictor of environmental advocacy. Those who have volunteered longer were more likely to think they would engage in environmental advocacy if their volunteer site changed in a negative way ($R^2 = 0.06$, $F = 3.89$, $p < 0.05$). Neither frequency of participation nor commitment, however, was a significant predictor of these factors. Long-term volunteering, therefore, appears to help build environmental advocates, or at least constituents who are willing to defend their local natural areas. While the opposite may be the case, we suspect that volunteering led to greater advocacy. The connection between long-term volunteering and growing environmental advocacy makes sense, considering that these volunteers have spent many years nurturing and restoring their volunteer sites and thus have more at stake in how these areas are managed.

Relationship between Motivations for Participating and Changes in Outlook and Actions

It would be interesting to know if the changes that volunteers experienced in their outlook and actions toward the environment were associated with their motivations for participation in volunteer stewardship activities. Table 6 shows that the motivations for volunteering were indeed strong predictors of changed environmental outlook and actions. Those with high social reasons for volunteering were much more likely to show attachment to the volunteer site, although none of the motivation factors was a significant predictor of participants' potential responses to a negative change to their volunteer site.

Those for whom reflection was a strong reason for volunteering were significantly more inclined to help create native landscapes wherever possible and to express greater general appreciation of natural areas. Recognition and likelihood of making changes to landscapes were also more likely to happen if individuals were motivated by learning. In addition, the general appreciation of natural areas was also more likely if participants were positive about the project organization.

As discussed earlier, reflection was not one of the stronger motivations for volunteering. Nonetheless, these results suggest that reflection can be a powerful

Table 6. Motivation factors as predictors of changed environmental outlook and actions (β coefficients)

Reason for volunteering	Change in environmental outlook and actions			
	Creating native landscapes	General natural area appreciation	Attachment to volunteer site	Environmental activism
Helping the environment				
Learning	0.22*			
Project		0.23**		
organization				
Social			0.38****	
Reflection	0.27**	0.30**		
Adjusted R ²	0.21****	0.27****	0.19****	0.11*
F	6.79	9.78	5.15	2.98

Note: Significance levels: * $p < 0.05$; ** $p < 0.01$; *** $p < 0.005$; **** $p < 0.001$.

force in changing people’s relationship to the environment. Those who felt that reflection was an important part of their volunteer activities might also have found some of these peaceful qualities when visiting natural areas, as indicated by their increased appreciation and exploration of such areas. Furthermore, in creating native landscapes, participants may also be creating personal places that allow them to reflect on nature as well as their own lives.

Learning new things was also associated with transformations in participants’ actions. Those who indicated that learning new things was an important benefit of volunteering were more likely to create native landscapes, such as backyard wildlife habitats, and recognize specific plants. Thus, it appears that the informal educational benefits of volunteering are helpful in building a cadre of environmental advocates who are able to create new native habitats beyond the borders of their volunteer sites.

The relationship between the social reasons for volunteering and the stronger attachment to the volunteer site broadens our understanding of attachment to include a connection to the place as well as to the other members of the volunteer group. Many of the volunteer activities are, in fact, social events. For some individuals the familiar faces are a source of satisfaction, while for others there is a joy from simply seeing that so many others are attracted to the stewardship activities. Thus, the social aspects of volunteering may play an important role in developing an attachment to the natural area where they volunteer.

Conclusion: Implications for Volunteer Stewardship Programmes

Volunteer stewardship activities create a reciprocal relationship between people and the environment with significant impacts for both partners. The environment is improved and the volunteers receive many benefits. This is a self-reinforcing relationship. Volunteers are transformed in their outlook toward the environment, becoming more likely to landscape with native plants, more apt to want to protect natural areas and more attached to local natural areas.

Participation in volunteer stewardship efforts has a multiplicative effect on volunteers' outlook and actions toward the environment that goes far beyond the specific volunteer tasks. As one participant commented, "Volunteering has filled in a part of that place we all have that isn't selfish, and needs to do the right thing. It has made me more aware, and both happier and sadder for my new knowledge about the environment and its condition."

The results of our previous studies (Grese *et al.*, 2000) showed that intrinsic rewards, such as concern for the environment and personal growth, were important motivations for volunteering initially. The current study expands on this finding by showing that these motivations, such as helping the environment and learning new things, continue to be important for long-term volunteers as well. These studies suggest that stewardship programmes that take into consideration volunteers' motivations at different stages of their participation have the opportunity to nurture both individual growth and the environment.

Our findings also point to the importance of considering volunteers as people with a deep commitment to their work. They are not free labour, but individuals who will keep coming if their needs are fulfilled. Programme co-ordinators need to recognize the engagement with the environment, the learning opportunities and the benefits that volunteers gain from contributing their time. Moreover, for organizational policy and planning, it is important to recognize that people have different needs at different times, and that there are many diverse motivations to consider (Table 7).

Programme co-ordinators concerned about volunteer retention should strategize ways to provide learning opportunities that appeal to a range of volunteer experience. For example, one restoration group in south-east Michigan includes a plant identification walk after a work day of clearing exotic plant species. Long-term volunteers might be engaged to lead these plant walks or the programme might offer a more advanced walk to appeal to their more experienced volunteers. Fortunately for volunteer co-ordinators, the natural world presents a myriad of opportunities for life-long learning.

Volunteer restoration projects provide people with the opportunity to help the environment in a very tangible way. Informal interviews during the pre-test of this study at a local arboretum work day revealed that long-term volunteers continued to participate in ecosystem restoration projects because it gave them a chance to help the environment in a concrete manner: seeing the tangible benefits of their efforts was more rewarding than sending a cheque to a national environmental organization. The results of our study showed that this

Table 7. Recommendations to stewardship programmes for improving their relationship with volunteers

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- Consider volunteer motivations at different stages of participation.
 - Provide learning opportunities, e.g. have volunteers participate and lead plant walks.
 - Show volunteers how their work has helped the environment, e.g. have field trips or slide shows that highlight improved habitat and other programme successes as part of work day.
 - Create time for volunteers to socialize and have 'fun' as part of work days.
 - Allow volunteers a chance to reflect on their work, e.g. provide some individual tasks that volunteers can do at their own pace.
 - Improve project organization:
train participants so they know what is expected of them;
make sure all volunteers are used effectively; do not over-staff work days or jobs.
-

motivation was very important to volunteers, regardless of the length of time that they had been involved in the programme or the frequency of volunteering. Programme co-ordinators need to remember to incorporate time during the busy work days to show volunteers how their work has improved the local habitat. Slide shows or field trips to project sites before, during and after restoration can help reinforce the positive results of stewardship activities.

At first glance, the social benefits did not appear as important as some of the other benefits of volunteering. However, the social factors were found to be more important to highly committed volunteers. In a study of volunteers in a hiking trail organization, Dresbach (1992) also found personal benefits (e.g. 'having fun' or 'meeting new people') to be the single greatest predictor of volunteer commitment. For programme co-ordinators intent on fostering volunteer commitment, these findings suggest that the social aspects of stewardship programmes should not be overlooked. Thus, while participants may be committed to helping the environment, work days are also seen as a time to have fun or socialize. In describing a stream monitoring programme, one participant wrote: "We've had fun and learned about streams and insects."

It should be noted that each factor plays a different role in volunteer commitment. While some factors, such as helping the environment and learning new things, appeared more important by their overall mean scores, other factors, such as reflection and social factors, were associated with changes in volunteers' attitudes and actions toward the environment. Thus, these motivations are not hierarchical or able to be excluded from consideration by volunteer co-ordinators or in organizational planning and policy.

Unlike the case in much of the literature on volunteer programming (Knoke, 1981), our volunteers did not indicate that they wanted to become leaders in the organization. This may be because the participants already felt too busy to take on these leadership roles or it could be related to different kinds of volunteering contexts. However, the importance of programme organization and policy must not be overlooked. Given the many demands on people's time, if a programme is disorganized, participants may feel that their time is being wasted. In fact, comments on our survey indicated that poor organization was a major reason for dropping out of a programme. For example, a participant stated that he left programmes that "did not respect the volunteer's time or the volunteer's need to feel that their time was valuably spent". Programme organizers need to train participants so that they know what is expected of them. In addition, programmes should be organized in such a way that everyone's participation is necessary and not superfluous. Feeling that one's presence is needed encourages participation (Gump & Barker, 1982).

An important finding from this study is that participation in volunteer stewardship activities produces an increased appreciation of and attachment to local natural areas and builds a constituency for preserving and protecting these precious bits of nearby nature. Local natural areas need advocates, because they are often less well known or glamorous than more distant threatened environments such as the rainforest. Environmental educators have begun to realize that ecosystem restoration projects also provide opportunities to teach children about the environment, while at the same time furthering rehabilitation of urban natural areas (Tanner *et al.*, 1992). It appears that these same benefits accrue regardless of the age of the participants.

This study has shown that there are numerous benefits that volunteers derive

from their ongoing participation in environmental stewardship programmes. Programmes that take into consideration these motivations can help build a strong volunteer base. Perhaps even more importantly for addressing environmental issues as a whole, this study has shown that participation in volunteer stewardship programmes can transform the way that people view the natural environment and environmental issues. In the words of one of our study participants, "It [volunteering] has opened up a whole new world for me and for my family. It has also greatly increased my love and respect for this area and for many of the wonderful people with strong ethical values about the environment." Volunteer stewardship programmes, therefore, have a critical role, not merely for the important habitats that are restored or monitored, but also for their influence in building a potentially powerful constituency of knowledgeable advocates for the environment.

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