

AN EXPLORATION OF VOLUNTEERS' MOTIVATIONS FOR AND BENEFITS OF
PARTICIPATING IN A GALÁPAGOS ISLANDS EARTHWATCH EXPEDITION

by

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List of Abbreviations

CDRS	Charles Darwin Research Station
ERB	Environmentally Responsible Behavior
EWI	Earthwatch Institute

Abstract

Conservation science and service projects benefit from the participation of thousands of volunteers each year. Yet little is known about these volunteers and particularly, about ones that participate internationally. I sought to address this gap by studying the motivations of volunteers who participated in an Earthwatch Expedition in the Galápagos Islands (the “Expedition”), the subsequent benefits they derived, and the likelihood of further engagement in conservation behaviors as a result of their participation. Two groups of volunteers were surveyed and interviewed. One group (n=27) was surveyed and interviewed before the Expeditions that occurred during fall 2006, immediately after these Expeditions, and over 14 months later. Another group (n=27) was surveyed and interviewed over 14 months after their spring 2005 to spring 2006 Expeditions. Factor analyses of the study’s quantitative data revealed a range of motivations and benefits including self-interested (learning and personal growth, exploration, social interaction, breaking out of the routine, and professional growth) and altruistic ones (contributing to future generations, making a difference, and meaningful involvement). Qualitative results suggested that traveling to a unique location was also an important aspect of this particular volunteer experience and that volunteers associated the above listed motivations and benefits with the Expedition providing an alternative to traditional tourism. There were few differences among volunteers with the exception that older volunteers placed greater importance on altruistic motivations and benefits, particularly contributing to future generations and making a difference. Results also revealed that the volunteers who participated in the Expedition already engaged in a number of conservation behaviors which may help to explain why there was limited evidence that their conservation behaviors increased as a result of the Expedition. Several recommendations are made that are aimed at providing organizations such as Earthwatch with the understanding necessary to attract and retain volunteers as well as to better meet their goal of fostering further conservation behaviors.

Introduction

International conservation-based volunteer research projects provide opportunities for natural scientists to obtain field assistance and financial resources to conduct conservation research around the world. In these projects, volunteers assist researchers with collecting baseline data on species composition, distribution, and abundance, donating thousands of hours of field work and millions of dollars annually to conservation research. An emerging sector of the tourism industry, volunteer tourism has increased steadily in recent years. According to the Travel Industry Association of America, more than 55 million Americans have participated in a volunteer vacation (NTA 2006). Over 100 million travelers say that they are considering taking a volunteer vacation, and in 2006 more than one in ten (11%) said that they were more interested compared to five years ago. In addition, according to a poll by travel web site Travelocity, the percentage of travelers planning to volunteer during their travel in 2007 was nearly double that of 2006 respondents (Forbes Traveler 2007). While volunteer vacations can encompass a broad range of types of volunteering, many of these experiences involve participation in conservation or scientific field research.

Despite the growing interest and participation of volunteers in conservation science projects abroad, hundreds of research projects continue to be underfunded. The gap between current participation levels and the potential of these projects to support more wide-spread conservation research led me to this question: How do we foster participation in international volunteer conservation science projects? To add to an understanding of the motivations for and benefits of participation in international conservation science projects, this study endeavored to answer the questions: what motivates these volunteers to participate, and once they do, what benefits do they derive from their participation? Further, what do volunteers need in order to fulfill their motivations for participating?

There is little research on volunteer motivations for and benefits of participation specific to conservation or science-based volunteering abroad, however, some studies on volunteer tourism in general provide a useful background for understanding volunteer motivations and benefits. Volunteer vacationers at orphanages, hospitals, and Habitat for Humanity projects identified cultural immersion, giving back, seeking camaraderie, and seeking educational and bonding opportunities as important motivations (Brown 2005). The same volunteers reported receiving benefits such as meeting people with shared interests, interacting with the local culture, a sense of self-fulfillment and appreciation for privilege, and personal growth. In the case of families volunteering together, educating children was identified as an important aspect of the volunteer experience. Brown further observed that volunteer vacationers appear to be motivated by a sense of adventure and exploration.

There is there is little research on the topic of volunteer travel and conservation research. One such study, a study examining the motivations and demographics of

“Research Ecotourists”, defines “Research Ecotourists” as those who volunteer with scientists working together on research or conservation tasks in the field (Galley & Clifton 2004). The researchers found that the most frequent reasons for participating in overseas Expeditions were “personal development” and “academic achievement”. A study on the values of volunteers in sea turtle research in Costa Rica showed that contributing to science, gaining fieldwork or research experience, and interactions with wildlife were important values to these volunteers (Campbell & Smith 2006).

A more broadly explored area of volunteering is that in the context of local environmental stewardship. Based on recent literature on the subject, we now know that volunteers in local environmental stewardship projects are motivated by and derive benefits that include helping the environment, learning, social interaction, making a difference, exploration, a chance to be away, meaningful action, personal growth, and spirituality, among others (Ryan et. al 2000; Grese et al. 2001; Schroeder 2000; Aull 2004; Miles et al. 2000). Further, volunteers in a loggerhead sea turtle project in Florida identified helping and protecting sea turtles as their main motivation. However, some were also driven by a desire to advance their careers and to help others (Bradford & Israel 2004).

Given that volunteering in international conservation science projects may be considered a form of environmentally responsible tourism and thus a form of environmentally responsible behavior (ERB), it’s important to consider the motivations for such activities in the context of ERB. While much of the literature on motivations for and benefits of ERB has focused on altruism, this perspective limits an understanding of the full range of motivations for these behaviors (Kaplan 2000; De Young 2000). In an effort to broaden the understanding of the range of possible motivations for ERB, research has attempted to distinguish self-interest from selfishness (Perloff 1987). In contrast to selfish behavior, considered to occur with no regard for others, self interest may be defined as taking care of yourself and your own needs, but may extend to taking care of the needs of others (De Young 2000). While much of the literature has focused on appealing to altruistic motivations to promote environmental behavior, it has overlooked many compelling self-interested motivations for such behavior, such as self-preservation, personal well-being, and personal enjoyment.

The role of self-interest in ERB has received more attention in recent years, and may be an important aspect of international volunteer experiences. The above studies in local environmental stewardship activities suggest that multiple motivations underlie environmental stewardship activities, and while some of them are may be characterized as altruistic (e.g. making a difference, helping), many suggest the importance of self-interest (e.g. learning, exploration, social interaction, academic achievement, career advancement). Other research suggests that volunteers who participate for self-interested reasons (such as esteem enhancement and personal development) are more likely to volunteer for a longer

period of time than volunteers that participate for social-issue or value based reasons (Clary & Snyder 1999).

Another possible self-interest motivation for volunteering in international conservation projects may be that volunteers consider their participation as leisure. Beyond the elements of the experience that relate to travel, volunteering is a use of one's discretionary time as thus may be considered leisure (Tedrick & Henderson 1989; Aull 2004). Volunteers may associate the benefits that they receive with leisure, such as socializing, being useful, and being physically rejuvenated (Grese et al. 2001). Conservation science projects abroad give volunteers the opportunity to combine two perceived leisure activities: travel and volunteering.

The Travel Industry Association of America reports that interest in volunteer vacations is stronger among Baby Boomers than any other age group (NTA 2006). Given the aging population in developed nations where volunteer tourists normally come from, the average age of volunteers in international conservation projects abroad is likely to increase. In addition, in 2006 the first of the United States 76 million Baby Boomers turned 60 (U.S. EPA 2006). Further, in the U.S., Baby Boomers are largest and wealthiest demographic. Many Baby Boomers are retired, indicating that this group may have the time and financial resources to travel and/or volunteer. In addition to having the resources to participate in these kinds of volunteer experiences, research suggests an increase in environmental values after middle age. Older adults are more likely than their middle age counterparts to express concern for the welfare of future generations and to purchase environmentally friendly products (Wright & Lund 2000). However, little is known about the participation of Baby Boomers in environmental stewardship, despite the fact that this growing segment of the population presents a unique opportunity for engaging the public in conservation. For the purpose of this study, seniors are therefore defined as being 50 and above, the age at which persons are eligible for membership with the American Association of Retired Persons (AARP), the nation's largest organization for older Americans.

In recent years, the number of organizations that offer conservation-science based volunteer work abroad has increased dramatically. The Earthwatch Institute (EWI) is the largest organization of this kind, engaging over 3,000 volunteers a year in 130 conservation science projects around the world. EWI estimates that, since its inception in 1971, more than 90,000 volunteers have contributed 11 million hours and \$67 million to scientific field work (EWI 2008).

Earthwatch seeks to foster conservation behaviors in its volunteers when they return from their Expedition. As indicated on Earthwatch's website, the organization's goal over the next decade is to "inspire our volunteers to create 35,000 local community action projects". In light of this goal, I also wanted to explore to what extent volunteers were more

likely to engage in environmental stewardship behaviors as a result of their Earthwatch experience.

Research suggests that the fulfillment of personal goals may lead to conservation behavior. Covitt (2002) explored the role of motive fulfillment in service learning and found that fulfillment of personal goals plays a significant role in whether or not students reported intentions to engage in environmentally responsible behaviors after their environmental education experience. Social support may be another agent for affecting changes in conservation behaviors. In a study of Earthwatch volunteers, McGehee (1999) found that participation in Earthwatch Expeditions had a positive effect on volunteers' social movement participation, their awareness of social issues, their networks, and their ability to overcome obstacles, although it did not have an effect on activism support (McGehee 1999).

To learn about volunteers' motivations for and benefits of participation in conservation science projects abroad, I focused on an Earthwatch Expedition in the Galápagos Islands, the *Galápagos Invasion* Expedition ("Expedition"). I examined stewardship volunteering at this specific location primarily because I worked as a Research Assistant for the Expedition. The Expedition was located on Santa Cruz Island and focused on the conservation of the *Scalesia* forest, an endangered forest located only on four islands in the archipelago. Eleven *Galápagos Invasion* Expeditions took place. Each Expedition was two weeks in length and occurred between May 2005 and November 2006, and involved over 70 Earthwatch volunteers. Volunteers were involved in a number of activities that primarily involved data collection on invasive species distribution and abundance. Volunteer activities also included pulling small invasive weeds by hand and cutting or girdling larger invasive trees as plant control measures. A typical field day involved six hours of hiking, data collection, and invasive tree control. The volunteers spent ten days in the field, with two days off in the middle to pursue leisure activities including day trips to other islands. As part of the expedition, a couple of naturalist guides also gave guided tours of the research site as well as several lectures on the natural history of the Galápagos. The first two days of the expedition were used for training purposes.

The study's primary goal was to determine the motivations for, benefits of, and needs of volunteers participating in the *Galápagos Invasion* Earthwatch Expedition. One theory describes motivation as deriving from real or perceived needs (Burns and Holden, 1995). As such, I also determined it valuable to examine the needs volunteers have for this type of volunteer experience. A secondary goal was to begin to explore to what extent the Expedition affected volunteers' conservation behaviors and to what extent volunteers' motivations and benefits can help to explain changes in these behaviors. The study was based on the assumption that that if more is known about volunteers and their motivations, organizations like Earthwatch can offer experiences that are more likely meet volunteers' needs and thereby maintain or increase their participation.

Methods

Sampling and response rates

Eleven two-week Expeditions took place over the course of four field seasons: spring and fall of 2005, and spring and fall of 2006. This study collected and analyzed data from two sets of individuals who volunteered in the Expedition. One set consisted of volunteers who participated in October or November of the fall 2006 field season (“Group 1” N=27). The other set of volunteers participated in Expeditions that occurred prior to the fall 2006 field season (“Group 2” N=43) from spring 2005 to spring 2006.

Group 1 volunteers were surveyed at three different time periods, while Group 2 volunteers were surveyed only 14 months or more after their participation in the Expedition. Sample sizes and response rates for the surveys are identified in Table 1.

Table 1. Survey sample sizes and response rates.

	Pre-Expedition	Immediately After Expedition	Over 14 Months After Expedition
Group 1	n=27, response rate=100%	n=27, response rate=100%	n=14, response rate=52%
Group 2	N/A	N/A	n=28, response rate=65%

Each time volunteers were surveyed, they were also invited to participate in an interview. Sample sizes and response rates for the interviews are listed in Table 2.

Table 2. Interview sample sizes and response rates.

	Pre-Expedition	Immediately After Expedition	Over 14 Months After Expedition
Group 1	n=23, response rate=85%	n=25, response rate=93%	n=11, response rate=100%
Group 2	N/A	N/A	n=9, response rate=100%

In total, 54 respondents completed the surveys and 36 participated in the interviews.

Data collection instruments

Each pre-, post-, and follow-up survey asked volunteers about 34 potential volunteer motivation/benefits (e.g. Please indicate to what extent the following motivated you to participate in the Expedition...Please indicate to what extent the following were benefits that you received from participating in the Expedition, with 1=Not at All to 5=Very Much a motive or a benefit). The motive/benefit measures in the surveys were primarily selected and adapted from two past studies (Ryan et al. 2000; Grese et al. 2001). For example, the measures “helping to restore the natural areas of the Galápagos” and “learning about the

unique plants and animals of the Galápagos” were adapted from Ryan’s (2000) survey of ecological restoration volunteers, which included the measures “helping to restore natural areas” and “learning about specific plants/animals.”

To measure changes in volunteers’ conservation behaviors, the pre-Expedition survey included eight questions about past conservation behaviors (e.g. In the past I have...), 11 about intentions to act (e.g. Within the next six months I intend to...), and four about membership in conservation organizations (e.g. I am currently a member of the following organizations...). The immediate post-Expedition survey and follow-up survey about 14 months later included 11 questions about subsequent behaviors (e.g. Within the last six months I have...) and four about membership in conservation organizations. The immediate and follow up surveys also included five questions about volunteers’ perceived knowledge gains (e.g. As a result of participating in this Expedition, I know more about...) and one question sought to assess volunteers’ satisfaction with the Expedition. Last, seven demographic and background questions were asked to test for differences in volunteers’ motivations, benefits and conservation behaviors. Before data collection, I pilot-tested the survey instrument with about five graduate students and members of the volunteers in other organizations, which lead to several editorial changes. Copies of the pre-, post-, and follow-up questionnaires are included in Appendices 2, 3, and 4.

The semi-structured interviews were conducted to enhance our understanding of participants’ responses to the questionnaires. Before data collection, I pilot tested the interview guide with about 20 volunteers from the fall 2005 Expedition. These pilot tests assisted with the development of the questionnaires and interview questions.

The interviews built on the survey by asking two questions. First, volunteers were asked to describe in more detail any measure which they scored a “5”, that is to say “Very Much” a motive or a benefit. This allowed us to gain a more in-depth understanding of what each measure meant to volunteers, why that motive or benefit was perceived as particularly important, and how it was connected to other motivations/benefits. The second question asked whether volunteers had additional motivations/benefits that were not identified in the survey. Last, the follow-up interview guide included a question about volunteers’ expectations for participating in the Expedition, so that I could learn about volunteers’ needs.

The interviews that took place before and immediately after participation in the Expedition were conducted in person, while the interviews that occurred over 14 months later were conducted by phone. All interviews were recorded and the recordings transcribed. It should be noted that I conducted and coded the interviews and served as the Research Assistant for the project.

Analysis

I used SPSS to perform factor analysis with Varimax rotation and Kaiser normalization on the 34 motive/benefit measures and the 11 intention/behavior questions. I performed various significant difference testing to determine differences in pre, post, and follow up responses as well as to explore differences in responses based on volunteers' demographics. These tests included paired-*t*, independent-*t*, and Chi-square tests. Results were interpreted as statistically significant at $\alpha = 0.05$ and in some instances, at 0.10.

Interview transcripts were coded using NVivo software by a single coder. A three part analysis of the qualitative data was performed, informed by the methodology put forth in Miles & Huberman (1994). This analysis consisted of: (1) qualitative data reduction through coding of interview transcripts and theme identification, (2) the design of data displays, including matrices and cognitive maps, and (3) conclusion drawing and verification. The process of theme identification and grouping occurred as an iterative process with the quantitative analysis. Motive and benefit measures were treated the same in the coding structure, resulting in the identification of overarching themes related to participation in the Expedition.

Quantitative Results

Characteristics of respondents

The following paragraphs describe the combined characteristics of both Group 1 and 2 respondents (total n=54), except where noted, because respondents in the two samples did not differ in most of their demographic or background characteristics (i.e., statistical tests did not identify significant differences).

The majority of the respondents were female (71%). Respondents' ages ranged from 19 to 78 with a mean of 52. Over half of respondents were over 50 (59%), many were over 60 (40%) and almost one third were "Baby Boomers" (31%); i.e., born after 1946 but before 1964 and thus, age 42-60 at the time of this study. Consistent with these data, slightly over one third of all respondents were retired (36%). While the two samples did not differ significantly in their numbers of retirees, almost half of Group 1 participants were retired (48%), compared to a quarter in Group 2 (25%). Respondents came from different countries and regions, including North America, Eastern and Western Europe, Africa, and Australia (Appendix Table 12 provides a complete list), however, the majority came from the US (60%) and quite a few from the UK (15%). Respondents were engaged in or retired from a range of professions, with the majority being business professionals (38%), followed by educators (26%), natural science professionals (16%), health professionals (13%), and artists (7%) (Appendix 11 provides a complete list).

Before the Expedition, Group 1 respondents were asked to share how often they participated in a variety of environmental stewardship behaviors (with 1=never to 5=very frequently). The most frequently engaged in behaviors were planting native species (mean=3.96) and weeding invasive species (mean=3.76). In contrast, few had written letters to support native species protection (mean=1.26) (Table 9).

In addition, Group 1 respondents were asked about their membership in environmental organizations prior to the Expedition. Slightly over half reported being members in local and national organizations that protect the environment (54% and 52%, respectively). About one third were members in international organizations that protect the environment (32%) and only a very few were members of an organization that supports the conservation of the Galápagos (8%).

While some Group 1 respondents reported having volunteered in a local (mean=2.83) or international (mean=2.52) environmental stewardship project, fewer had volunteered in a national environmental stewardship project (mean=1.91). In addition to being asked about the frequency of their volunteering, Group 1 respondents were asked how recently they had volunteered in an environmental stewardship program. Very few had volunteered within the

past month (9%), slightly over half within the past year (55%), few within the past two years (9%), and quite a few more than two years ago (18%). The remaining few had never done so (9%). Last, prior to going on the Expedition, 25% of respondents had participated “very frequently” in a prior Earthwatch Expedition, while 46% reported never having participated in one.

As a result of participating in the Expedition, the majority of respondents in Group 1 and Group 2 (who again did not significantly differ in their responses to these set of questions) agreed (with 1=strongly disagree to 7=strongly agree) that they had increased in relevant knowledge (about invasive species: mean=6.5, endangered species: mean=6.09, Galápagos conservation issues: mean=6.80), skills (mean=5.85), and that they were satisfied with the Expedition (mean=6.52). I had also asked Group 1 respondents these questions immediately after the Expedition and there were no significant differences in their responses between that time and 14 months later when I asked them these questions again.

Motivations for volunteering

One of the main objectives of this study was to determine what motivates volunteers to participate in an Earthwatch Expedition in the Galápagos Islands, and in particular, how the motivations of older volunteers may differ compared to those of younger volunteers.

Through the responses provided by volunteers in Group 1 I learned that individuals had several motivations for participating in the Expedition. Factor analysis of responses to the 34 questionnaire measures grouped the motivations into six different categories. I named these categories as: (1) Contributing to future generations, (2) Learning and personal growth, (3) Breaking out of the routine, (4) Making a difference, (5) Professional growth, and (6) Exploration (Table 3).

In combination, I believe these motivations can be characterized as both altruistic (i.e., Contributing to future generations, Making a difference) and self-interested (i.e., Learning and personal growth, Professional growth, Breaking out of the routine, and Exploration).

All six motivations appeared to be similarly important (mean range: 2.88-4.06, with 1 = not at all to 5 = very much of a motive). Contributing to future generations had the highest and Professional growth had the lowest mean (4.06 and 2.88, respectively), the remaining four motivations had means higher than 3.0. It is not surprising that professional growth was the least important motive given that the majority of respondents were older and many were retired.

Table 3. Motivations for participating in the Galápagos Invasion Earthwatch Expedition.

Motive Factor	Loading
Factor 1: Contributing to future generations	
<i>Cronbach's α (n=7): .922</i>	
<i>Average Factor Loading: .785</i>	
Helping to restore the natural areas of the Galápagos	0.913
Contributing to scientific knowledge	0.655
Preserving the Galápagos for future generations	0.898
Contributing to the conservation of the Galápagos	0.857
Contributing to the protection of a world heritage site	0.832
Leaving a legacy for future generations	0.708
Contributing my own skills and talents to the conservation of the Galápagos	0.633
Factor 2: Learning and personal growth	
<i>Cronbach's α (n=6): .883</i>	
<i>Average Factor Loading: .726</i>	
Achieving personal growth	0.655
Working alongside scientists	0.760
Working with others to achieve shared goals	0.664
Doing something challenging	0.782
Learning new skills	0.794
Interacting with different age groups	0.703
Factor 3: Breaking out of the routine	
<i>Cronbach's α (n=5): .859</i>	
<i>Average Factor Loading: .746</i>	
Rejuvenating my physical and mental well-being	0.670
Breaking out of the routine	0.807
Meeting people	0.687
Having a sense of purpose	0.794
Doing something with my hands	0.772
Factor 4: Making a difference	
<i>Cronbach's α (n=4): .785</i>	
<i>Average Factor Loading: .669</i>	
Feeling a sense of accomplishment	0.739
Being useful	0.501
Seeing the results of my efforts	0.647
Making a noticeable difference	0.787
Factor 5: Professional growth	
<i>Cronbach's α (n=3): .773</i>	
<i>Average Factor Loading: .709</i>	
Exploring a potential new career	0.853
Understanding the conservation issues that are facing the Galápagos	0.544
Gaining field experience	0.731
Factor 6: Exploration	
<i>Cronbach's α (n=5): .726</i>	

Average Factor Loading: .623

Interacting with the local culture	0.531
Learning about the unique plants / animals of the Galápagos	0.769
Being in nature	0.625
Having close encounters with wildlife	0.551
Exploring the Galápagos at my own pace	0.641

Percent of Variance Explained by all six factors: 72%

In addition to identifying the above motive factors, I also reviewed which of the 34 individual motive measures were rated highest (i.e., those that had a mean of 4.0 or above with 4=much to 5=very much of a motive). Table 4 identifies these measures and also indicates which motive factor these measures loaded on.

Table 4. Individual motive measures with a mean of 4.0 or higher.

Measure	Mean	Motive Factor
Traveling to a unique location	4.74	None
Learning about the unique plants / animals of the Galápagos	4.59	Exploration
Being in nature	4.42	Exploration
Preserving the Galápagos for future generations	4.41	Contributing
Helping to restore the natural areas of the Galápagos	4.33	Contributing
Learning about the natural or cultural history of the Galápagos	4.31	None
Contributing to the protection of a world heritage site	4.30	Contributing
Contributing to the conservation of the Galápagos	4.26	Contributing
Being useful	4.22	Difference
Working alongside scientists	4.11	Learning
Feeling a sense of accomplishment	4.00	Difference
Understanding the conservation issues that are facing the Galápagos	4.00	Professional
Having close encounters with wildlife	4.00	Exploration

As suggested by Table 4, over a third of the potential individual motivations were rated highly (13 of 34 measures or 38%). Four of the measures loaded on Contributing to future generations, three of them on Exploration, two of them on Making a difference, one on Learning, and one on Professional growth. Two additional measures were not included in any of the six motive factors because they were not correlated with any of them. Consistent with the earlier factor analysis results, responses to these individual measures also suggested that participants were motivated by a combination of self-interest (7 of 13 measures, 54%) and altruistic motivations (6 of 13 measures, 46%). Reviewing responses to these individual motive measures suggests that, in addition to the six motivations identified through the factor analysis and as would be expected, respondents were very much motivated to participate in this Expedition because of its location in the Galápagos. Almost half of the measures that were rated highly focused on the Galápagos (6 of 13 measures, 45%).

How did motivations differ based on participants' demographics/background?

There were few significant differences in motivations based on participants' demographics. However, in light of the study's questions about the influence of age, it is interesting to note that there were two relevant significant differences at an $\alpha = .05$ and one at an $\alpha = .10$. First, respondents who were over 60 differed significantly from those under 60 in one motive factor. Those over 60 identified Contributing to future generations as a more important motive than those under 60 (mean 4.43 versus 3.78, $p=0.033$). Consistent with these results, retirees identified Contributing to future generations as a more important motive than did non-retirees (mean=4.45 versus 3.76, $p=0.032$). Third, although respondents did not differ in their factor motivations based on their professions at $\alpha = .05$, there was one significant difference at an $\alpha = .10$ ($p=0.071$). For the Exploration motive, health professionals had the highest mean (4.44), followed by natural science professionals (4.25), education professionals (3.97), artists (3.80) and last, business professionals (3.26). Last, no differences in motive factors were found based on respondents' citizenship, gender, being part of the Baby Boomer generation, being over or under age 50, or based on how recently they volunteered as part of an environmental stewardship project.

Benefits from volunteering

Another one of the study's main objectives was to determine volunteers' perceived benefits from participating in an Earthwatch Expedition in the Galápagos Islands and again, if seniors' perceived benefits differed compared to those of younger volunteers.

For Group 1 participants, I was able to measure perceived benefits at two times, immediately after the Expedition and 14 months later. For Group 2 participants, I was able to measure perceived benefits only at a single time, between 14 and 27 months after the Expedition.

Next, I describe the benefits expressed by Group 1 participants immediately after the Expedition. After this, I describe the combined benefits for Group 1 and Group 2 participants expressed over 14 months after the Expedition. I present the combined results for these two groups because their responses to the individual measures did not differ substantially.

Perceived benefits immediately after the Expedition

I learned that individuals in Group1 felt they benefited from participating in several different ways immediately after the Expedition. More specifically, a factor analysis identified four immediate perceived benefits that I characterized as: (1) Contributing to future generations, (2) Learning and personal growth, (3) Exploration, and (4) Making a difference (Table 5).

As suggested by these results, respondents felt they benefited in altruistic (i.e., Contributing to future generations, Making a difference) and self-interested (i.e., Learning and personal growth, Exploration) ways. All four factor benefits appeared to be similarly important (mean range: 3.16-4.04 with 1 = not at all to 5 = very much of a benefit). Contributing to future generations had the highest and Learning and personal growth had the lowest mean, the remaining two benefits had means higher than 3.0.

Table 5. Perceived benefits immediately after participating in the Expedition.

Benefit Factor	Loading	Motive Factor
Factor 1: Contributing to future generations <i>Cronbach's α (n=10): .93</i> <i>Average Factor Loading: .745</i>		
Helping to restore the natural areas of the Galápagos	0.656	Contributing
Contributing to scientific knowledge	0.778	Contributing
Feeling a sense of accomplishment	0.663	Difference
Being useful	0.744	Difference
Preserving the Galápagos for future generations	0.712	Contributing
Fulfilling my responsibility to future generations	0.731	None
Contributing to the conservation of the Galápagos	0.562	Contributing
Contributing to the protection of a world heritage site	0.878	Contributing
Having a sense of purpose	0.844	Breaking Out
Leaving a legacy for future generations	0.879	Contributing
Factor 2: Learning and personal growth <i>Cronbach's α (n=7): .88</i> <i>Average Factor Loading: .723</i>		
Achieving personal growth	0.729	Learning
Gaining field experience	0.735	Professional
Working with others to achieve shared goals	0.866	Learning
Doing something challenging	0.676	Learning
Learning new skills	0.510	Learning
Interacting with different age groups	0.808	Learning
Meeting people	0.735	Breaking Out
Factor 3: Exploration <i>Cronbach's α (n=5): .86</i> <i>Average Factor Loading: .747</i>		
Being in nature	0.682	Exploration
Having close encounters with wildlife	0.899	Exploration
Traveling to a unique location	0.699	None

Having fun	0.620	None
Exploring the Galápagos at my own pace	0.833	Exploration

Factor 4: Making a difference

Cronbach's α (n=4): .79

Average Factor Loading: .632

Seeing the results of my efforts	0.659	Difference
Doing something with my hands	0.820	Breaking Out
Contributing my own skills and talents to the conservation of the Galápagos	0.535	Contributing
Making a noticeable difference	0.513	Difference

Percent of Variance Explained by all four factors: 58%

Note: The far right column identifies the name of the motive factor this measure was found to load on earlier (see previous section).

In addition to identifying the above factors, I also again reviewed which of the 34 individual benefit measures were rated highest (i.e., those that had a mean of 4.0 or above with 4=much to 5=very much of a benefit). Table 6 identifies these measures and also indicates the benefit and motive factors these measures loaded on.

Table 6. Individual perceived benefit measures with a mean of 4.0 or higher and above.

Measure	Mean	Benefit Factor	Motive Factor
Traveling to a unique location*	4.70	Exploration	None
Learning about the unique plants / animals of the Galápagos*	4.56	None	Exploration
Learning about the natural or cultural history of the Galápagos*	4.41	None	None
Being in nature*	4.30	Exploration	Exploration
Understanding the conservation issues that are facing the Galápagos*	4.26	None	Professional
Having fun	4.11	Exploration	None
Being useful*	4.04	Contributing	Difference
Helping to restore the natural areas of the Galápagos*	4.00	Contributing	Contributing
Meeting people	4.00	Learning	Breaking Out
Contributing to the conservation of the Galápagos*	4.00	Contributing	Contributing

Note: The eight benefit measures with a * also had a mean of 4.0 or higher as a motive, indicating that these measures were both strong motivations and strong immediate benefits.

As suggested by results in Table 6, almost one third of the potential benefit measures fell into this highly rated category (10 of 34 measures or 29%). Three of the measures loaded on Exploration, two of them on Contributing to future generations, one of them on Learning and personal growth. Three additional measures were not included in any of the four benefit factors because they were not correlated with them (see Table 6). Consistent with earlier factor analysis results, responses to these individual measures also suggested that participants benefited in both altruistic and self-interested ways. However, self-interested benefits were identified more often than altruistic ones (7 of 10 measures or 70%, versus 3 of 10 or 30%).

As with the individual motive measures, these responses suggest that respondents derived benefits from this Expedition because of its location in the Galápagos. Above half of the measures that were rated highly focused on the Galápagos (6 of 10 measures, 60%).

How did benefits differ based on participants' demographics/background?

Results of significant difference testing suggest that there were few differences in immediate benefits based on participants' demographics. However, in light of the research interest in the influence of age, it is interesting to note two significant differences, one at $\alpha = .05$ and one at $\alpha = .10$. The first difference was between respondents who were retired and those who were not. Retirees identified Contributing to future generations as a more important benefit than non-retirees (mean=4.18 vs. 3.51, $p=0.032$). The second difference was between respondents who were Baby Boomers and those who were not ($p=0.058$). Baby Boomers reported Learning and personal growth as less of a benefit (mean=3.00 versus 3.73) than those who were not. No differences in immediate benefit factors were found based on respondents' profession, citizenship, gender, being over or under 50 or 60, or based on how recently they volunteered as part of an environmental stewardship project.

What was the relationship between participants' motivations and perceived benefits immediately after the Expedition?

One of the questions I was also curious about was about the relationship between participants' motivations and perceived benefits. To answer this question, I examined the correlations between motivations before, and perceived benefits immediately after the Expedition.

Recall that earlier analyses identified six motive factors and four perceived benefit factors immediately after the Expedition. Analyses indicated that all four of the benefit factors were significantly correlated with their respective motive factors. In order from highest to lowest, these were the correlations for the benefit/motive factors: Learning and personal growth ($r=.73$, $p<.001$), Contributing to future generations ($r=.56$, $p=.038$), Making a difference ($r=.49$, $p=.010$), and Exploration ($r=.42$, $p=.031$). Thus it appears that these four motivations were at least partially fulfilled. In contrast, it does not appear that participants' motivations for Breaking out of the routine and Professional growth were fulfilled as these were not identified as benefits.

Perceived benefits 14 months or more after the Expedition

As a way to assess perceived benefits from participating in the Expedition over time, volunteers were surveyed 14 months or more after their participation.

For the following set of analyses, I combined the perceived benefits reported by Group 1 and Group 2 volunteers because their responses to the individual measures did not differ substantially. I found only four out of 34 possible significant differences between Group 1 and Group 2 means. In addition, the actual differences in these means were quite small with the largest difference between the groups' means being only .96 (on a 5 point scale).

A factor analysis for combined data from Group 1 and Group 2 respondents identified four later benefits that I characterized as: (1) Contributing to future generations, (2) Social interaction, (3) Meaningful involvement, and (4) Learning through exploration (Table 7). Consistent with earlier immediate benefit results, respondents continued to feel that they benefited in altruistic (i.e., Contributing to future generations, Meaningful involvement) and self-interested (i.e., Social interaction and Learning through exploration) ways. All four benefits appeared to be similarly important (mean range: 3.77-4.41 with 1 =not at all to 5 =very much of a benefit). In contrast with benefits reported immediately following the Expedition, however, “learning through exploration” replaced “contributing to future generations” as the benefit with the highest mean, and “social interaction” replaced “learning and personal growth” as the benefit with the lowest mean. The remaining two benefits had means higher than 3.0.

Table 7. Perceived benefits 14 months or more after participating in the Expedition.

Benefit 2 (B2) Factor	Loading	Motive (M) Benefit (B1) Factors
Factor 1: Contributing to future generations		
<i>Cronbach's α (n=9): .94</i>		
<i>Average Factor Loading: .775</i>		
Helping to restore the natural areas of the Galápagos	0.764	Contributing (M, B1)
Contributing to scientific knowledge	0.644	Contributing (M, B1)
Preserving the Galápagos for future generations	0.930	Contributing (M, B1)
Fulfilling my responsibility to future generations	0.793	Contributing (B1)
Contributing to the conservation of the Galápagos	0.912	Contributing (M, B1)
Contributing to the protection of a world heritage site	0.859	Contributing (M, B1)
Leaving a legacy for future generations	0.803	Contributing (M, B1)
Seeing the results of my efforts	0.622	Difference (M, B1)
Contributing my own skills and talents to the conservation of the Galápagos	0.671	Contributing (M)
Factor 2: Social interaction		
<i>Cronbach's α (n=4): .78</i>		
<i>Average Factor Loading: .717</i>		
Breaking out of the routine	0.660	Breaking Out (M)
Meeting people	0.708	Br. Out (M) Learn (B1)

Having fun	0.771	Exploration (B1)
Interacting with different age groups	0.730	Learning (M, B1)

Factor 3: Meaningful involvement

Cronbach's α (n=5): .84

Average Factor Loading: .676

Working with others to achieve shared goals	0.607	Learning (M, B1)
Feeling a sense of accomplishment	0.653	Diff. (M) Contrib. (B1)
Being useful	0.727	Diff. (M) Contrib. (B1)
Having a sense of purpose	0.766	Br. Out (Contrib. (B1)
Doing something with my hands	0.628	Breaking Out (M), Difference (B1)

Factor 4: Learning through exploration

Cronbach's α (n=5): .77

Average Factor Loading: .646

Working alongside scientists	0.722	Learning (M)
Being in nature	0.746	Exploration (M, B1)
Learning about the natural or cultural history of the Gal.	0.664	None
Learning about the unique plants/animals of the Gal.	0.537	Exploration (M)
Understanding the conservation issues facing the Gal.	0.563	Professional (M)

Percent of Variance Explained by all four factors 50%

Note: The far right column identifies the name of the motive factor (M) as well as the benefit factor immediately after the Expedition (B1) this measure was found to load on earlier (see previous sections).

In addition to identifying the above factors, I again also reviewed which of the 34 individual benefit measures were rated highest (i.e., those that had a mean of 4.0 or above with 4=much to 5=very much of a benefit). Table 8 identifies these measures and also indicates which benefit and motive factors these measures loaded on.

Table 8. Individual benefit measures with a mean of 4.0 or higher and above.

Measure	Mean	Benefit 2 Factor	Benefit 1Factor	Motive Factor
Traveling to a unique location*	4.85	None	Exploration	None
Learning about the natural or cultural history of the Galápagos*	4.62	Learning/Exploration	None	None
Learning about the unique plants / animals of the Galápagos*	4.59	Learning/Exploration	None	Exploration
Being in nature*	4.57	Learning/Exploration	Exploration	Exploration
Understanding the conservation issues that are facing the Galápagos*	4.48	Learning/Exploration	None	Professional
Feeling a sense of accomplishment*	4.26	Meaningful involvement	Contributing	Difference
Contributing to the conservation of the Galápagos*	4.24	Contributing	Contributing	Contributing
Preserving the Galápagos for future generations*	4.22	Contributing	Contributing	Contributing
Having close encounters with wildlife*	4.17	None	Exploration	Exploration
Helping to restore the natural areas of the Galápagos*	4.13	Contributing	Contributing	Contributing

Being useful*	4.13	Meaningful involvement	Contributing	Difference
Contributing to the protection of a world heritage site*	4.13	Contributing	Contributing	Contributing
Working with others to achieve shared goals	4.07	Meaningful involvement	Learning	Learning
Having fun	4.02	Social interaction	Exploration	None

Note: The twelve benefit measures with a * also had a mean of 4.0 or higher as a motive, indicating that these measures were both strong motivations and strong later benefits.

As suggested by the results in the above table, over one third of the potential benefit measures fell into this highly-ranked category (14 of 34 measures or 41%). Four of the measures loaded on Learning through exploration, four on Contributing to future generations, three on Meaningful involvement, and one on Social interaction. Two additional measures were not included in any of the four later benefit factors because they were not correlated with them. Consistent with earlier factor analysis results, responses to these individual measures also suggested that participants benefited in both altruistic and self-interested ways. Self-interested were equally likely as altruistic measures to be identified (7 of 14 measures or 50%).

As with the individual motive and immediate benefit measures, these responses suggested that respondents derived later benefits from this Expedition because of its location in the Galápagos. Half of the measures that were rated highly focused on the Galápagos (7 of 14 measures, 50%).

How did benefits 14 months or more after the Expedition differ based on participants' demographics/background?

Test results suggested that there were six significant differences in benefit factors 14 months or more after the Expedition based on participants' demographics, five at $\alpha=.05$ and one at $\alpha .10$. Respondents over 50 identified two benefits as being more important benefits than those under 50: Meaningful involvement (mean=4.22 vs. 3.60, $p=.032$) and Contributing to future generations (mean=4.15 vs. 3.60, $p=.043$). Likewise, respondents over 60 were also more likely to identify Meaningful involvement as a benefit than those under 60 (mean=4.35 vs. 3.67, $p=.005$). Also consistent with these results, respondents who were retired were more likely to identify Meaningful involvement as a benefit compared to non-retirees (mean=4.31 vs. 3.74, $p=.029$). In contrast, non-Baby Boomers were more likely to identify Meaningful involvement as a benefit than were Baby Boomers (mean=4.14 vs. 3.58, $p=.041$). The final significant difference at an $\alpha =.10$ level was between respondents who had recently volunteered as part of an environmental stewardship project and those who had not.

Respondents who had never volunteered for such a project or had done so more than one year ago identified Social interaction as a more important benefit than did those who had volunteered more recently (mean=4.50 vs. 4.04, $p=.072$). Last, no differences in these benefit factors were found based on respondents' profession, citizenship, or gender.

What was the relationship between participants' motivations and perceived benefits 14 months or more after the Expedition?

Another question I wanted to explore was to what extent participants' motivations were related to perceived benefits 14 months or more after the Expedition. I answered this question using benefit data from both Groups and motive data from Group 1 respondents. I did this because the perceived benefits by the two groups did not significantly differ, because of the relatively small number of Group 1 respondents who provided data on their later perceived benefits, and because I collected pre-data only from Group 1 respondents. I analyzed both significant differences between individual motive and later benefit measures as well as the correlations between motive and benefit factors.

Testing revealed seven significant differences between individual motive and later benefit measures at $\alpha=.05$, all of which were reported as more important over 14 months later than before participation in the expedition: (1) interacting with the local culture (mean=3.37 vs. 3.95), (2) breaking out of the routine (mean=3.11 vs. 4.00), (3) working with others to achieve shared goals (mean=3.70 vs. 4.02), (4) doing something with my hands (mean=2.89 vs. 3.52), (5) gaining field experience (mean=3.00 vs. 3.32), (6) meeting people (mean=3.44 vs. 3.86), and (7) interacting with different age groups (mean=3.11 vs. 3.20). There were two significant differences at $\alpha=.10$, both of which were more important later on: (8) traveling to a unique location (mean=4.74 vs. 4.84), and (9) seeing the results of my efforts (mean=3.11 vs. 3.53). Appendix 6 shows mean scores of all the 34 motivation/benefit measures.

Also recall that the motive factors were Contributing to future generations, Learning and personal growth, Breaking out of the routine, Making a difference, Professional growth, and Exploration. The benefit factors 14 months later were Contributing to future generations, Social interaction, Meaningful involvement, and Learning through exploration. Thus, there were some similarities but also some differences between these motive and later benefit factors. Contributing to future generations was a motive before and a benefit after the Expedition (before mean=4.06, after mean=4.04). These two were significantly correlated ($r=.47$, $p=.056$) and thus at least partially fulfilled. In addition, the motive Making a difference was significantly correlated with the benefit Contributing to future generations ($r=.55$, $p=.021$) and Meaningful involvement ($r=.74$, $p=.002$) and thus again, at least partially fulfilled. Last, although Learning and personal growth and Exploration loaded as separate

motive factors, respondents did not view them as distinct benefits 14 months after the Expedition. Consistent with these factor analysis results, the motive Exploration was correlated with the benefit Learning through exploration ($r=.61$, $p=.019$). In addition the same motive Exploration was also correlated with the benefit Social interaction ($r=.56$, $p=.031$) which was not identified as a motive for participating in the Expedition. In contrast to the motivations and benefits just described, the motivations Breaking out of the routine, Learning and personal growth, and Professional growth and were not correlated with benefits perceived 14 months after the Expedition and thus not likely to have been fulfilled.

Volunteers' environmental stewardship behavior

The last set of survey questions focused on learning about volunteers' environmental stewardship behaviors, mainly to determine what changes may have occurred as a result of the Expedition. I was interested in several questions:

- What environmental stewardship behaviors did volunteers report engaging in over 14 months after the Expedition?
- How did environmental stewardship behaviors over 14 months later differ based on participants' demographics/background?
- Were there differences in the environmental stewardship behaviors Group 1 participants engaged in before (Time 1) and after participating in the Expedition (Time 3)?
- What were the relationships between participants' intentions immediately following participation in the Expedition (Time 2) and their self-reported behaviors 14 months or more later (Time 3)?
- What were the relationships between respondents' perceived benefits from participating in the Expedition and their self-reported environmental stewardship behaviors 14 months or more later (Time 3)?

Each of the above questions will be addressed in the text that follows.

What environmental stewardship behaviors did volunteers report engaging in over 14 months after the Expedition?

To answer this question, I first determined if there were significant differences in the mean frequency with which respondents in Group 1 and Group 2 reported to be engaging in environmental stewardship behaviors (see Table 9 Behavior at Time 3 means for both groups

and last column for p values). I found significant differences between the two groups in only two of the 11 possible measures: wrote letters to support native species protection (p=0.009) and became a member of an organization that supports the conservation of the Galápagos (p=0.035). In both instances Group 2 respondents reported engaging in these two behaviors more frequently than Group 1 (Group 2 means=1.27, 1.40), Group 1 means=2.61, 2.77) (Table 9). However, because the differences in the two groups' means were substantively small (response options ranged from 1-7), I decided it would be appropriate to conduct subsequent analyses based on combining data from Groups 1 and 2.

Table 9. Significant difference between intentions and behaviors at different times and between the two groups.

Intention / Behavior Questions	Behavior at Time 1*(Group 1)	Intention at Time 1	Intention at Time 2**	Behavior at Time 3*** (Group 1)	Behavior at Time 3 (Group 2)	Behavior Time 1 vs. Behavior Time 3 (Group 1)	Time 1 vs. Time 2 Intentions	Time 2 Intention vs. Time 3 Behavior (Group 1)	Grp. 1 vs. Grp. 2 Behaviors at Time 3
Write letters to support native species protection	1.26	2.92	3.30	1.27	2.61	ns	ns	p=.006	p=.009
Become a member of an organization that supports conservation of the Galápagos	1.25	4.08	4.81	1.40	2.77	ns	ns	p=.000	p=.035
Weeded invasive species from my yard	3.79	5.28	5.93	4.20	5.25	ns	ns	p=.081	ns
Planted native species in my yard	3.96	5.60	5.67	4.47	4.68	ns	ns	ns	ns
Participated in another Earthwatch Expedition	2.67	4.81	4.78	2.80	3.86	ns	ns	p=.027	ns
Volunteered in an environmental stewardship project: locally (within the state where I live)	2.83	4.21	4.81	3.43	4.08	ns	p=.092	ns	ns
Volunteered in an environmental stewardship project: nationally	1.91	3.35	4.07	2.00	2.58	ns	p=.032	p=.036	ns
Volunteered in an environmental stewardship project: internationally	2.52	4.65	4.44	2.43	3.24	ns	ns	p=.053	ns

Shared my experiences of the Expedition through: speaking informally	N/A	5.36	4.78	6.33	5.59	N/A	p=.056	p=.024	ns
Shared my experiences of the Expedition through: news media	N/A	3.13	2.37	2.20	2.27	N/A	p=.069	ns	ns
Shared my experiences of the Expedition through: presentations	N/A	4.61	3.89	2.67	3.07	N/A	ns	p=.001	ns

*Time 1 = Pre-Expedition

**Time 2 = Immediately after Expedition

***Time 3 = Over 14 months after Expedition

Next, I conducted a factor analysis of the 11 behavior measures for both groups. This analysis revealed three reliable environmental stewardship behavior factors that I characterized as (1) Volunteering away from home, (2) Local individual behavior, and (3) Citizen behavior (Table 10). The factor analysis also suggested that two measures loaded on a factor that I initially characterized as Formally sharing experiences (i.e., Sharing experiences through news media, Sharing experiences through presentations). The reliability for this later factor, however, was low (Cronbach's $\alpha = .36$). I thus conducted all subsequent analyses by examining results for these two measures individually.

Table 10. Self reported environmental behaviors over 14 months after participating in the Expedition.

In the past six months I have:

Behavior	Loading
Factor 1: Volunteering away from home	
<i>Cronbach's α (n=3): .80</i>	
<i>Average Factor Loading: .785</i>	
Volunteered in an environmental stewardship project: nationally	0.720
Volunteered in an environmental stewardship project: internationally	0.849
Participated in another Earthwatch Expedition	0.785
Factor 2: Local individual behavior	
<i>Cronbach's α (n=4): .80</i>	
<i>Average Factor Loading: .724</i>	
Weeded <u>invasive</u> species from my yard	0.886
Planted <u>native</u> species in my yard	0.831
Volunteered in an environmental stewardship project: locally	0.730
Shared my experiences of the Expedition through: speaking informally	0.447
Factor 3: Citizen behavior	
<i>Cronbach's α (n=2): .83</i>	
<i>Average Factor Loading: .865</i>	

Written letters to support native species protection	0.882
Become a member of an organization that supports conservation of the Gal.	0.848
Single measure: Sharing experiences through news media	0.582
Single measure: Sharing experiences through presentations	0.357
Percent of Variance Explained by the three factors 60%	

Also note that respondents were asked to report the frequency of their participation in various behaviors with 1=never to 7=very frequently. Given our relatively limited sample size, I decided to reduce these to two options dividing those less likely to engage in the behavior and those more likely to engage in the behavior for subsequent analyses. To determine the cut off for each factor or measure, I examined the factors' and measures' response distributions. The cut offs I selected are listed in Table 12.

As a result of all of the above, I ultimately determined that the majority of participants were likely to engage in Local individual behavior (72%) followed by Sharing experiences through presentations (55%), Volunteering away from home (54%), and Citizen behavior (48%). Relatively fewer participants were likely to Share Experiences through the News Media (33%). Based on interview data, I learned that many of these presentations were given to coworkers (to meet the requirements of a company scholarship to go on the Expedition), or were to members of organizations the volunteer belonged to such as the local Kiwanis Club. Volunteers who shared their experiences through news media often did so through local newspapers, and sometimes through online publications.

How did environmental stewardship behaviors over 14 months later differ based on participants' demographics/background?

After determining what environmental stewardship behaviors respondents reported engaging in over 14 months after the Expedition, I explored to what extent there were significant differences based on participants' demographics/background. These analyses identified only two significant differences in environmental stewardship behaviors at $\alpha = .10$. Non-Baby Boomers were more likely to report sharing their experience through news media than Baby Boomers (mean=2.42 versus 1.46, $p=0.066$). Our data also suggest that older individuals (those over 60) are probably more likely to share their experiences through news media than Baby Boomers (age 46-60) and other younger participants. While the difference was not statistically significant, the mean frequency of those over 60 reporting that they shared their experiences through news media was higher than those for under 60 (mean=2.65 versus 1.67). In addition, I learned that there was a difference in Local individual behavior among participants with different professions ($p=0.060$). Natural science professionals reported participating in Local individual behavior (mean=6.34) more frequently than respondents from other professions (business professionals: mean=4.56, education

professionals: mean=4.23, health professionals 4.13, no artists responded to relevant questions). No differences in environmental stewardship behaviors were found based on respondents' citizenship, gender, being over or under 50, being retired, or based on how recently they volunteered as part of an environmental stewardship project (Table 11).

Table 11. Self-reported behaviors 14 months or more after participating in the Expedition.

Behavior Factors or Measures	% that was likely to participate	Gender	Retirement Status	Profession	Baby Boomers	Over 50	Over 60	Stewardship	Citizenship
Volunteering (Away From Home) (0-1.9)	54	ns	ns	ns	ns	ns	ns	ns	ns
Individual Behavior (Locally) (0-3.9)	72	ns	ns	p=.060	ns	ns	ns	ns	ns
Citizen behavior (0-1.9)	48	ns	ns	ns	ns	ns	ns	ns	ns
Sharing experiences through news media (0-1)	33	ns	ns	ns	p=.066	ns	ns	ns	ns
Sharing experiences through presentations (0-1)	55	ns	ns	ns	ns	ns	ns	ns	ns

Were there differences in environmental stewardship behaviors Group 1 participants' engaged in before (Time 1) and over 14 months after participating in the Expedition (Time 3)?

After determining the extent to which participants engaged in a number of environmental stewardship behaviors over 14 months after the Expedition and exploring differences based on demographic and background characteristics, I proceeded with exploring if there were changes in the frequency with which Group1 respondents reported engaging in these behaviors before and after the Expedition.

In addition to testing for significant differences based on the behavior factors, I tested for significant differences between each of the 11 individual behavior measures and found none (Table 9). Note however, that with the exception "Volunteering Internationally," means were higher after the Expedition than before on (Table 9).

Interestingly, however, participating in the Expedition appears to have prompted respondents' to change their membership in environmental organizations. Before the Expedition, only a few Group 1 respondents reported being a member of an organization that supports the conservation of the Galápagos (8%). After the Expedition, many Group 1 and

Group 2 respondents who did not significantly differ in their responses indicated that they had become a member of such an organization (66%). The fact that this change in membership may have occurred and an explanation for why was offered by a participant as part of our interviews:

“I like supporting the worthwhile well run projects, so having no knowledge of the Galápagos, if someone came and, if I got something in the mail and it said save the *Scalesia* forest, I wouldn’t even read it. So now I have a little more personal interest, and now the Galápagos is part of me. And now I would consider mild support of an existing well-run project. It’s made it more personal.”

In contrast, respondents’ membership in international organizations that protect the environment did not appear to change (32% versus 34%) and their membership in local and national organizations that protect the environment may have declined (54% to 43% and 52% to 32% respectively).

What were the relationships between participants’ intentions immediately following participation in the Expedition (Time 2) and their self-reported behaviors 14 months or more later (Time 3)?

I explored the relationships between respondents’ intentions immediately after participation and their self-reported environmental stewardship behaviors 14 months or more after the Expedition.

As noted in the table below (Table 12), there were significant correlations between intentions before and immediately after the Expedition.

Table 12. Intention and behavior correlations.

Intention / Behavior Questions	Intention Time 1 & Intention Time 2 (Grp 1)		Intention Time 2 & Behavior Time 3 (Grp 1)		Behavior Time 1 & Behavior Time 3 (Grp 1)	
	r	p-value	r	p-value	r	p-value
Write letters to support native species protection	.645	.001	.138	ns	-.434	ns
Become a member of an organization that supports conservation of the Galápagos	.469	.018	.010	ns	a	.000
Weeded invasive species from my yard	.665	.000	.111	ns	.661	.019
Planted native species in my yard	.815	.000	.276	ns	.322	ns

Participated in another Earthwatch Expedition	.537	.005	.355	ns	-.465	ns
Volunteered in an environmental stewardship project: locally (within the state where I live)	.714	.000	.158	ns	.565	.070
Volunteered in an environmental stewardship project: nationally	.849	.000	-.191	ns	-.283	ns
Volunteered in an environmental stewardship project: internationally	.826	.000	.096	ns	.195	ns
Shared my experiences of the Expedition through: speaking informally	.843	.000	.332	ns	N/A	N/A
Shared my experiences of the Expedition through: news media	.626	.001	-.017	ns	N/A	N/A
Shared my experiences of the Expedition through: presentations	.552	.006	.778	.001	N/A	N/A

In contrast, I found only one significant correlation between Group 1 respondents' intentions immediately after the Expedition and their self-reported behaviors over 14 months or more (Table 12): the intention to “Share my experiences of the Expedition through presentations” was highly correlated with the behavior ($r=0.78$, $p=.001$).

In addition to examining these correlations, I tested for significant differences in the mean frequency with which respondents intended to engage in environmental stewardship behaviors and their self-reported behaviors. There were significant differences in eight of the 11 possible measures (Table 9). As might be expected, in all but one case, respondents' intentions were greater than their subsequent self-reported behaviors. The one exception was “Sharing my experiences of the Expedition through speaking informally”. Respondents reported engaging in this behavior more frequently than they had intended to (intention mean=4.78 versus behavior mean=6.33, $p=.024$, with 1=extremely unlikely to 7=extremely likely for intentions and 1=never to 7=very frequently for behaviors). Last, participants' intentions and self-reported behaviors did not significantly differ for (1) plant native species in my yard, (2) volunteer in an environmental stewardship project locally, and (3) share my experiences of the Expedition through news media.

In addition to examining differences between individual intention and self-reported behavior measures, I tested for significant differences between the factors. I conducted factor analyses of intentions (immediately following participation) and the resulting factors were very similar to the behavior factors. In other words, factor analysis of the intention measures produced factors similar to those from analysis of the behavior measures. I therefore created intention factors based on the measures I found to lead to the different behavior factors. Consistent with the above results for individual measures, respondents had

significantly greater intentions than their subsequent self-reported behaviors: (1) Volunteering away from home (mean before=4.14, mean after=2.45) ($p=.065$), (2) Citizen behavior (mean before=3.56, mean after=1.33) ($p=.003$), and (3) Sharing my Experiences of the Expedition through Presentations (mean before=3.89, mean after=2.39) ($p=.002$).

In summary, volunteers' intentions to engage in behaviors related to environmental stewardship were not correlated with subsequent behaviors, with the exception of sharing experiences through presentations. Further, volunteers had higher intentions to engage in behaviors than they reported engaging in. The exception was sharing experiences through speaking informally, which volunteers engaged in more frequently than they intended to.

What were the relationships between respondents' perceived benefits from participating in the Expedition and their self-reported environmental stewardship behaviors 14 months or more later (Time 3)?

Last, I was curious about the relationships between respondents' perceived benefits from participating in the Expedition and their self-reported environmental stewardship behaviors. I explored these relationships by examining Group 1 and Group 2 respondents' perceived benefits and environmental stewardship behaviors 14 months or more after the Expedition. As described earlier, factor analyses suggested that respondents perceived four benefits and reported engaging in five types of environmental stewardship behaviors at this particular time. Out of the twenty possible correlations between benefits and behaviors, only three were significant at $\alpha = .05$ and one at $\alpha = .10$. The first three significant correlations were between the perceived benefits Contributing to future generations, Meaningful involvement, and Learning through exploration and Local individual behavior ($r=.52$, $p=.001$, $r=.54$, $p<.001$ and $r=.34$, $p=.034$ respectively). The remaining perceived benefit, Social interaction, was not significantly correlated with this behavior. The fourth significant correlation was between the perceived benefit of Contributing to future generations and Citizen behavior ($r=.27$, $p=.094$). Overall, I therefore found some evidence that there may be a moderate relationship between perceived benefits and Local individual behavior and some evidence to suggest a relationship between the specific benefit of Contributing to future generations and Citizen behavior. In all other cases, however, I did not identify results to suggest a strong relationship between perceived benefits and environmental stewardship behaviors.

Qualitative Results

This section describes select results from the interviews with participants before the Expedition, after the Expedition as well as over 14 months later. These interviews were conducted to gain additional, and more in-depth, insight into participants' motivations and benefits and to learn more about volunteers' needs.

Additional insights into volunteers' motivations and benefits

Results from the interview largely confirmed the results from the quantitative analyses. For example, the many of motivations and benefits identified as important based on the factor analyses were also mentioned frequently as part of the interviews (Table 13). Moreover, volunteers' quotes were illustrative of the motivations and benefits that I felt the factors represented (Table 14). Contributing to future generations is related to a perceived inherent value in preserving the Galápagos, and volunteers benefited by feeling good about having given back to the place they visited and offsetting the negative impacts of tourism, such as the degradation of the natural environment. Learning and personal growth is experienced as a benefit in that volunteers receive a richer learning experience than they would as regular tourists. Breaking out of the routine involves mental rejuvenation and having new and challenging experiences. Making a difference involves being useful and seeing the results of one's efforts. Social interaction is related to meeting like-minded people, working with a team, and being able to travel without friends and family but still as part of a group. Exploration describes volunteers' interest in being in nature, experiential learning, exploring the Galápagos at one's own pace, being able to go places and see things that regular tourists are not able to, and even improving cognitive function and decision-making.

Table 13 identifies the different types of motivations/benefits discussed by volunteers during the interviews and the frequency with which these motivations/benefits were raised.

Table 13. Motivation/benefit themes for participating in the Expedition.

Motive/Benefit	# ¹	# ²	%
Theme 1: Alternative to tourism			
Theme 1a: Contributing to future generations			
Helping to restore the natural areas of the Galápagos	27	44	40
Contributing to scientific knowledge	16	18	24
Preserving the Galápagos for future generations	40	60	59
Contributing to the protection of a world heritage site	10	16	51
Making a contribution to the planet in exchange for exploring it*	35	67	51
Increasing others awareness about environmental issues	24	46	35
Theme 1b: Learning and personal growth			
Learning about the natural or cultural history of the Galápagos	34	46	50
Learning new skills	19	30	28
Learning about the unique plants and animals of the Galápagos	47	64	69
Learning about the realities of the Galápagos*	36	73	53
Working alongside scientists	13	20	19
Achieving personal growth	8	13	12
Theme 1c: Breaking out of the routine			
Doing something challenging	25	36	37
Rejuvenating my physical and mental well-being	24	42	35
Seeing things from a different perspective*	17	27	25
Doing something with my hands	10	12	15
Theme 1d: Making a difference			
Feeling a sense of accomplishment	22	44	32
Being useful	17	29	25
Seeing the results of my efforts	12	22	18
Making a small contribution to a big effort*	9	13	13
Having a sense of purpose	8	9	12
Theme 1e: Social interaction			
Meeting people	33	58	49
Working with others to achieve shared goals	30	63	44
Having fun	29	38	43
Interacting with different age groups	17	20	25
Theme 1f: Exploration			
Having new experiences*	37	59	54
Being able to see things and go places that tourists normally don't*	41	65	60
Being in nature	45	73	66
Close encounters with wildlife	24	29	35
Exploring the Galápagos at my own pace	14	15	21
Theme 2: Traveling to a unique location*			
Interacting with the local culture	28	43	41
Birthplace of evolutionary biology	19	36	28
Reputation and lifetime dream	25	39	37
Unique wildlife	25	40	37

Note: The “#¹” column refers to the number of interviews in which each motive or benefit was mentioned, #² refers to the number of references to the motive or benefit, and the “%” column refers to the percent of 68 interviews in which it was mentioned. *Indicates a new motive or benefit, not identified as part of the questionnaire.

Table 14. Illustrative quotes for each of the motivations and benefits identified by volunteers.

Theme	Illustrative Quote
Theme 1: Alternative to tourism	
Theme 1a: Contributing to future generations	<p>I sort of felt that we took something away from the islands, just in terms of, any time you go to a place like that, you are making a mark on it. But we also helped the islands while we were there so, you know, and it gave me a nice feeling.</p> <p>Saving the Galápagos, as unique as it is, saving it’s wildlife, you know the tortoises, the sea lions, the lizards... everything that was there initially, and not letting them be overrun, it’s got to be an imperative... we gotta try to preserve it. And to have tried to do a tiny bit, it makes me feel good.</p>
Theme 1b: Learning and personal growth	<p>I would go (as a tourist), probably, but I would go on a tour that wouldn’t get half of the information or half of the experience. And I’m not saying that they wouldn’t tell you about the birds or whatever, but you’re not going to get hands on. You’re going to go get the look and then walk off.</p> <p>I’ve got possibly a more realistic view of the position that the Galápagos are in. Paul’s talks have been enormously helpful as a really valuable part of the experience.</p>
Theme 1c: Breaking out of the routine	<p>Coming here just two weeks, making these simple routines every day, going up in the field, doing something useful, looking how people live here far more simpler. And just enjoying a moment in the sun, or playing in the water, or watching an iguana. It’s very important for me. It brings me back to the essentials of life that we tend to forget.</p> <p>Other motivations? Well, I guess one is that it’s a vacation. I work really hard, every three months I am needing a break...so although I like to work hard here, it’s not the same mental stress – something very mentally stressful would not be a suitable Earthwatch trip for me. Physical stress is great, not mental.</p> <p>Every so often I get this urge to move and this urge to discover something new and to get out of the norm and leave my comfort zone. Earthwatch projects allow me to do that, without having to commit to two years overseas like with Peace Corps. It gives you kind of that little taste that you wouldn’t be able to get from a normal vacation.</p>
Theme 1d: Making a difference	<p>Being useful in the sense that it just takes manpower to clear all those weeds up there. A lot of manpower, so I did contribute to that in a way...I could do it and perhaps others couldn’t do it.</p> <p>Kind of along that same line is that everyone had a role to play. I didn’t feel like I was just following someone around and didn’t have anything to do. Like the Mongolia trip, I was just following the researcher, and he was doing the telemetry and he was taking the notes and he was doing everything. And we were just standing there. And this one you were definitely being useful.</p> <p>I think this more than any other project that I’ve been on so far, you can see the tangible benefits right away as far as actually cutting down the trees and seeing them fall. As opposed to the dolphin study where I were just counting and the benefit would be later. But</p>

	<p>this was I think the most tangible because you could actually see what was happening.</p>
Theme 1e: Social interaction	<p>I think one of the things that Earthwatch provides is the opportunity to meet people, where immediately on day one you have something in common because of the fact that you're choosing to take a vacation where you're volunteering.</p> <p>Always the Earthwatch people are such an interesting collection of world travelers.</p> <p>Most volunteers that join Earthwatch are individuals. I don't have any close friends that would go on trips like this. I mean I have friends that I've gone on trips to Europe with, but people that I know don't want to do anything really like this. This is nice to be able to go somewhere by myself, and meet other people who are also traveling by themselves, and then contribute and be doing something in an interesting place. .</p> <p>It's one of the things I think we are starting to lose. Enjoying being with others. Just being with other human beings. And I don't have time for this anymore at home. The time I've spent here talking with (name omitted) about her grandsons, or (name omitted) sister, I would probably have spent less with my good friends at home. Because everyone is running and rushing.</p> <p><i>But you feel that you got that here?</i></p> <p>Yeah. When you are in an isolated place with people who have the same goal, you have far more opportunities to exchange goals. You have the time and the patience. I enjoyed that everybody was working hard in the field, giving everything. Nobody was trying to cheat or to let the other do it, I don't care or something. This says a lot. People came here because they really think they have a job to do, and they believe in what they do. So it's a sense of community.</p> <p>Working with the team...you got the possibility of doing more things like that.</p>
Theme 1f: Exploration	<p>I have found from experience that taking a place at <i>your</i> own pace enables you the space and opportunity to just see how the people who are living here live, and how they make do, and how they interact and just how they live their daily lives.</p> <p>Just going out there, I mean I don't think I'll ever forget the smell of sauco (laughs) and what it looks like, and the blackberry and the <i>passiflora</i> and all those plants and the quinine and then of course the animals themselves. And be able to be in their habitat. And have the finches come by and the mocking birds and all that. It was great.</p> <p>Something that's always brought me inner peace is just being out in nature and I think the thing that the Galápagos trip offered that you can't typically get is the fact that I were going in areas that people just don't go into. I think that made that even more special, knowing that I could have been the first person walking in an area.</p> <p>You can read books, you can study in university or elsewhere, but when you are in the field, you have to decide what to cut, what to write, what to see, what to do... You have to see with a new point of view the nature all around you.... and try to understand why I have to do this. And this was very, very important for me.</p>
Theme 2: Traveling to a unique location	
Theme 2: Traveling to a unique location (Galápagos)	<p>When I chose a project, location is the first thing I look at. And that's more important to me than what the work is. While I know that the work is with invasive plants, I can look over here at this bird and also be seeing these other things. And that was the primary motivator, was the location here.</p> <p>Anything that gets closer to the native cultural experience is good. You could go to Hawaii and watch a hula dance, because that's sort of a cultural thing, but that's not what I'm talking</p>

	<p>about. I really want to know how present day rural people live.</p> <p>When I went to Nepal, one of the Principal Investigators was Nepalese. Because I had a Nepalese native, who spoke and knew subtle cultural differences, I think I had an experience that was not otherwise attainable</p> <p>It was a life-building experience in getting to go somewhere like that, and just in terms of broadening your own experience, that's one of the things that I very much took from it. Galápagos was like nowhere else, I've traveled fairly extensively, I've been to like thirty or forty countries, I've never seen anywhere like Galápagos, so, from that point of view, it was just mind blowing.</p> <p>Well, particularly the Galápagos, their reputation for being unafraid of humans. I don't think of them as pets, but I would guess that animals that are not afraid of humans are going to provide special sort of encounters.</p> <p>Galápagos is iconic...it's a name that everyone recognizes.</p> <p>For me the Galápagos is the Mecca for Biology teachers. All biology is here, at hand. It is the seat of Darwin's observations.</p> <p>It's been a lifelong journey to here I think. It's been an ambition of mine, and a dream to get here.</p>
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Importantly, the interviews also provided a number of new insights into participants' motivations and benefits. Each of these will be identified and described in turn.

Traveling to a unique location

First, the interviews highlighted just how important traveling to the Galápagos was to these particular volunteers (Table 13/14). As indicated by their quotes, the Galápagos' reputation and wildlife as well as the opportunity to interact with the local culture all contributed to what volunteers considered traveling to a unique location (Table 13/14). While the factor analysis had not revealed traveling to this unique location as a distinct motive or benefit, analyses of the highest ranked individual measures suggested that this motive and benefit may have been important to volunteers and interviews confirmed this theme.

Alternative to tourism

Second, the interviews highlighted that volunteers perceived the Expedition to provide them with an alternative to traditional tourism. In fact, with the exception of traveling to a unique location, this particular motive and benefit appeared to be one that

volunteers associated the remaining motivations and benefits with. Consider the following quotes:

“Really what they [Earthwatch] have to sell, I think, is that you don’t have to be a tourist. I don’t want to be a tourist anymore. I’ve traveled enough, been a tourist enough, I find it very boring. Earthwatch gets you down to a level where you are closer to the culture. Interesting trips, interesting places, great people that come on the trips.”

Other volunteers suggested that they would consider typical tourism, but that they prefer travel experiences with Earthwatch because they see them as providing richer experiences than typical tourism. For example, while volunteers indicated that they broadly associate traveling with learning (“I *love* traveling and finding out about new things, landscapes, and people and plants and different cultures”), they associate Earthwatch Expeditions as providing richer learning experiences than traditional tourist experiences:

“I would go (as a tourist), probably, but I would go on a tour that wouldn’t get half of the information or half of the experience. And I’m not saying that they wouldn’t tell you about the birds or whatever, but you’re not going to get hands on. You’re going to go get the look and then walk off.”

Last, with regard to perceiving the Expedition as an alternative to tourism, several individuals expressed concern about how traditional traveling might impact local cultures or the environment. These particular individuals viewed their participation in the Expedition as a means to help offset or mitigate the impact of their travels, particularly in the context of climate change. For example,

“I sort of felt that we took something away from the islands, just in terms of, any time you go to a place like that, you are making a mark on it. But I also helped the islands while we were there so, you know, and it gave me a nice feeling.”

“I wanted to visit the Galápagos, and I hope my contribution to the project will help offset or justify the increase in CO₂ between that and the travel.”

“I feel very guilty about traveling long distance via craft. And so I just want to do something to give something back, so I’m not feeling so guilty. There’s quite a movement in Britain about the changes in the climate and things, and what you are giving up. And I was on a demonstration one time and somebody said to me, “Have you given up your holidays by air?” And I thought, “I couldn’t do that”. And then I thought, I must be positive, and try and think of another way around that.”

“Well I am concerned about air travel, and yet I love to go and visit other places, and the only way to do it in a short time is to fly. So I am trying to make a balance.”

Some volunteers had planned other trips in South America to follow their Earthwatch trip, and stated that they viewed their Earthwatch trip as justifying the other, purely for pleasure, trips:

“Well, it’s been a working thing, so I feel we’ve earned a bit of holiday now, because that was one of the first reasons why we’ve looked to Earthwatch. I feel guilty traveling all this way and not giving something back. And so now I feel now that we’ve earned our trip around the islands, you know?”

Third, another new set of insights provided by the interviews consisted of them highlighting additional dimensions of the motive and benefit factors revealed through the factor analysis and confirmed through the interviews. These additions can be found in Tables 13/14. For example, contributing to the planet in exchange for exploring it and increasing the environmental awareness of others upon their return from the Expedition were identified as additional motivations and benefits associated with contributing to future generations.

To summarize the qualitative results described so far (Figure 1), volunteers were motivated by and derived benefits from the Expedition in that it presented an opportunity to travel to a unique location and an alternative to traditional tourism.

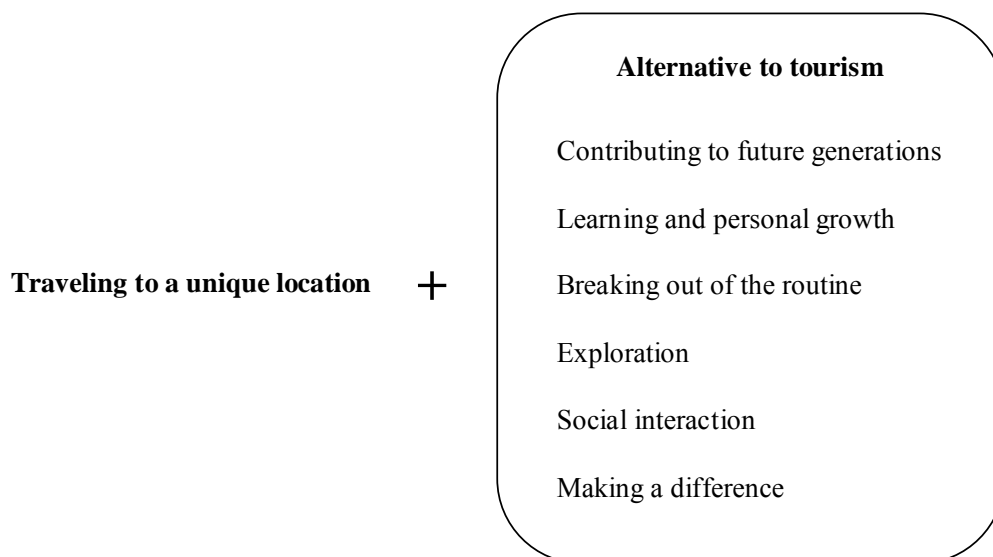


Figure 1. Motivations and benefits for participating in the Expedition.

Association between the benefits learning and personal growth, exploration, and contributing to future generations

Another insight obtained through the interviews was that volunteers closely associated the benefits of learning and personal growth, exploration, and contributing to future generations, and that they view these as supporting each other (Figure 2).

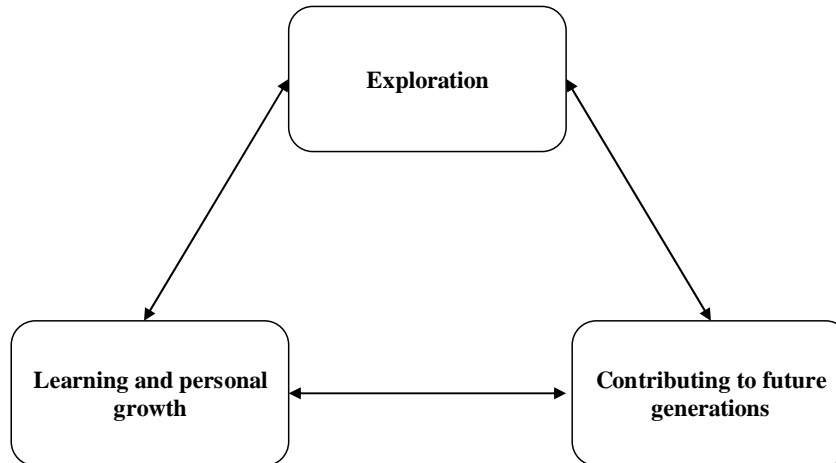


Figure 2. Associations between benefits: Learning and personal growth, Exploration, and Contributing to future generations.

How are learning and exploration associated?

Volunteers indicated that the combination of learning through lectures and exploration through being in the field provided them with an experience that enhanced the benefits of both:

“Like knowing what sauco smells like is still very vivid in my memory, and I even can remember that – the name of that plant. So, you know, things like that really get implanted because you’re actually there doing it, you’re actually out there involved with it, more than you would be if you were just listening to somebody talk about it on a boat or something like that. So I think that because of how Earthwatch is put together as far as the briefing and then the presentation, then actually being out there doing something and being close to nature, really helps you to learn about the ecosystem in ways you wouldn’t normally learn.”

Similar to the above example, other volunteers also commented on learning from nature-based experiences provided by the Expedition:

“You couldn’t have really got the awareness of the invasive plants you see to the extent that we got it, without going into the field like we did.”

“Paul’s (the naturalist guide’s) lectures were very stimulating. The field wasn’t quite as stimulating, but it also gave you a lot of time to think about what you were doing out there.”

How are learning and exploration associated with contributing?

The statement below summarizes the sentiments of many volunteers on the association between learning and contributing:

“I like to learn. And if you learn your world, you know. When you know, you help.”

In addition to contributing time, money, and labor to the Expedition, volunteers perceive that they contribute through their increased awareness of environmental issues. In particular, they perceived themselves as being advocates for the Galápagos:

“Well I think all learning is valuable, and I must say that having had an experience like this you’re a far better advocate for Galápagos than your average tourist, because you’ve actually left something there. There’s a sense of accomplishment there that is quite unique.”

“I tend to be sort of lazy in my reading and it’s not that I couldn’t have learned a lot about the Galápagos if I had been motivated to read on my own, but somehow or another, being there, seeing it, listening to people talk about it, makes it very real and it makes it much more easy to absorb. Because everyone’s heard about it, but they really don’t know what it’s like. And they don’t even realize that there are problems with invasive species. They think it’s just the way Darwin discovered it. And it’s good for me to tell people, hey you know, that’s not the reality of it anymore.”

In fact, one volunteer went so far as to suggest that his increasing awareness about invasive species was a more important contribution than his work in the field:

“It was rewarding in that sense you were doing something to help, and the help might have been more in raising awareness as opposed to stopping invasive species in that forest particularly.”

How is contributing associated with learning and exploration?

As just indicated above, volunteers believe that as a result of being more aware of conservation issues facing the Galápagos such as invasive species, they will be more likely to advocate for their protection. Such advocacy is seen as an important component of the contribution that volunteers make through their participation in Earthwatch Expeditions. They further associated the importance of their participation with contributing to current and future generations:

“Well, it is a laboratory and it’s a spectacular teaching tool and it does need to be kept in pristine condition for future generations to learn and to benefit from what’s there.”

“We were able to learn so much and appreciate so much from what we’re able to see. If we don’t leave it there, learning about it from a book isn’t nearly as effective as to actually have it really be there. I mean, what we know about the saber-toothed tiger is not nearly what we know if we still had a saber-toothed tiger around. So all is lost and diminished when you lose a species, or you lose a chunk of the world. You can’t learn from it anymore, and you can’t have it be of value as much to you anymore, because there isn’t as much information available. For the world to be able to see what Darwin saw, it needs to be intact. There ought to be something left for them to look at and discover on their own, as opposed to if it’s gone, then it’s not there available for someone to learn from and to do their own investigative work on.”

Another volunteer noted that he viewed his participation as contributing an increased awareness of environmental issues in those around him:

“It’s not that I can really do very much, but sometimes just by in a sense, setting an example you can often motivate others to do it. And I think people will think, “Oh, well, he’s done it”, and put it in people’s minds. That perhaps, it’s a worthwhile thing to do.”

The importance of self-interest as a motive and benefit

Quantitative results suggested that volunteers had both self-interested and altruistic motivations for participating in the Expedition and that they experienced both types of benefits. Moreover, volunteers distinguished between their self-interested and altruistic goals. Consider the following quote, which also illustrates that volunteers may view Earthwatch’s goals as altruistic:

“First of all, I wanted to come to the Galápagos. And then while I’m there, I think, my goodness, maybe I can help do some research ’cause you need bodies, basically, Earthwatch needs bodies for the projects. The whole point in having Earthwatch is that the scientist needs help, period. And I thought, well maybe I can help.”

Not only did volunteers distinguish between self-interest and altruistic goals but they also stressed the importance self-interest played relative to altruistic motivations and benefits:

“An enormous amount of that motivation would be my own pleasure – which isn’t a very high-level purpose. So I was very wary of some of your questions that could give the impression that you are very worldly and very purposeful, when in fact, a lot of the motivation was I wanted to see the Galápagos. That’s personal, rather than saving the world. There is that other side to it.”

“Maybe I’m quite shallow. I don’t think I actually thought about it that much. I just thought Galápagos, South America. I’ve always wanted to go to South America, the Galápagos have always appealed. There’s a lot on television about the Galápagos Islands – they’re very well known. I know I didn’t specifically think what contribution I was going to give. My motivation was I want to go somewhere, I want to go somewhere different, and this is somewhere different. And it could’ve been a project on your tortoises or it could’ve been a project on something completely different and I probably still have come here.”

Differences in motivations and benefits based on age and significance to motive fulfillment and benefit enhancement

Overall, there were few differences in motivations and benefits of volunteers of different demographics and backgrounds. However, the quantitative analysis showed that at all three time periods, contributing to future generations and making a difference were identified as more important motivations and benefits to older volunteers than to younger ones. The statements below illustrate the importance of these altruistic motivations and benefits to older and retired volunteers:

“After retiring, I couldn’t sit around and twiddle my thumbs. I didn’t want to travel just to travel. I wanted to get involved.”

“That I could go. At my age I could go and do something. And be useful. Be able to participate in a project that would benefit who ever or whatever.”

The above quote also highlights the importance of being useful to this volunteer and suggests she was concerned about being able to contribute. In fact, the most commonly cited concern senior volunteers had prior to participating in the Expedition was over their ability to perform the field research and contribute as they intended to. All of the quotes below are from volunteers age 50 and over:

“Well, I think my first feeling is: Am I able to make the grade and contribute as I want to? Because this is a totally new area for me – the work in the field like that.”

Beyond the challenge of doing something new, some volunteers were apprehensive about participating based on their age:

“Eventually I phoned them and said, “I am too old?” And she said “No”. So then I felt, “Ok, this is what I’d like to do”.”

“I thought we’d be sort of in the geriatric section. But in fact, I’ve noticed that people are our age or older.”

Importantly, volunteers reported that their participation in the Expedition increased their confidence in their ability to participate in similar field research activities:

“I think the challenge was at the beginning, because you didn’t know what you were going into. And not having been involved in an Earthwatch project before...There was the challenge of going into something new and there was the concern whether you’d be up to the physical challenge of it. A challenge that was quite challenging, wasn’t it? But, the fact that I was up to it was of great benefit because it meant, well, that you’re 65, but you’re...I’m able to do other, other similar things, which opened up more sorts of possibilities. The one that we’re going on later this year I think will be quite demanding. Certainly we’ll be less physically comfortable than the Galápagos in that we’ll be staying in tents all the time. It will be quite hard work, physically, I think. But, you know, it’s given us the confidence to do that.”

“I would never have done that if I hadn’t had to. I’m not sure that I knew that I could lift trees and throw them down. But I did – so I know that I can. You wind up, “Hey, I can do these things.” So you learn your strengths. You develop new abilities.”

Supporting volunteers' motive fulfillment or benefit enhancement

How could Earthwatch volunteers' experience be changed to more likely lead to motive fulfillment or benefit enhancement? This was a final question I wanted to explore as part of this study. To do so, I asked participants, as part of the interviews, to share if they had any expectations for the Expedition that weren't met, and if so, what could have been done to better meet their needs. Table 15 presents an overview of the responses that volunteers gave to this question. The themes in Table 15 represent the expected benefit that wasn't fulfilled, while the subthemes represent the volunteers' responses about how the experience could have been changed to assist them in deriving the benefits they desired.

As shown in Table 15, many of the subthemes were identified by a small number of respondents. This is because in general, respondents stated that there were no or few expectations for the Expedition that we're met, a finding that is reflected in the high satisfaction rating given on the questionnaire (see pg. 12). In contrast, many volunteers believed that being ill during the Expedition greatly hindered their ability to contribute to the research. The most frequently cited feature of the Expedition that would have allowed for greater motive fulfillment was the opportunity for continual learning throughout the Expedition (cited by 19% of respondents). For example, many volunteers felt that the benefits they derived from learning were limited to the beginning of the research project and tapered off near the end.

Table 15. Volunteers' suggestions and needs for supporting their motive fulfillment or benefit enhancement.

Needs	# ¹	# ²	%
Theme 1: Alternative to tourism			
Theme 1a: Contributing to future generations			
Being well	11	15	16
Physical preparedness	10	11	15
Prior confidence in my ability to perform field research	5	7	7
Theme 1b: Learning and personal growth			
Continual learning throughout the Expedition	13	23	19
Involvement in the scientific process, not just field work	5	7	7
Theme 1c: Breaking out of the routine			
Opportunities for personal restoration	4	6	6
Single supplement option	2	2	3
Hotel accommodations	2	2	3
Theme 1d: Making a difference			
Confidence that the research efforts make a difference	12	14	18
Follow-up on report on project results	7	7	10
Being useful	5	8	7
Seeing the results of my efforts	4	6	6

Theme 1e: Social interaction			
Cultural experience	6	13	9
Camaraderie with other group members	5	7	7
Large enough group for social interaction	3	5	4
Theme 1f: Exploration			
Day trips organized	6	6	9
Opportunities for exploration	4	7	6
Theme 2: Traveling to a unique location			
Expeditions in locations that I haven't traveled to yet	1	2	1

Note: The “#¹” column refers to the number of interviews in which each motive or benefit was mentioned, #² refers to the number of references to the motive or benefit, and the “%” column refers to the percent of 68 interviews in which it was mentioned.

In addition to the suggestions for motive fulfillment, a significant number of volunteers cited certain experiences that they attributed with receiving certain benefits. First, many volunteers identified the lectures, presentations, and interpretive guiding given by naturalist guides during the Expedition as being integral to receiving learning as a benefit (cited by 35% of respondents). Second, volunteers felt that having two days off of field work allowed them to experience exploration as a benefit (cited by 13% of respondents).

Table 16 offers representative quotes that illustrate how volunteers expressed their suggestions related to motivations and benefits.

Table 16. Illustrative quotes for each of the volunteers' suggestions and needs for supporting their motive fulfillment or benefit enhancement.

Theme	Illustrative quote
Theme 1: Alternative to tourism	
Theme 1a: Contributing to future generations	I was so fearful that could I do the job. So I was really pleased to be actually, be part of the teamwork. Well I've done four Expeditions, well this will be my fourth. The middle two I didn't like as much, and the first one I liked very much. And it wasn't because of the project or location, it was the contribution factor. I think that that has a lot to do with my motivation. To feel like I am actually contributing something. Like the project that I was on last year, I were just following researchers around. I weren't really...you know I were helping to measure but it didn't seem like...it was something that they were just standing there watching us. I didn't feel like as a volunteer I was doing anything to help them. And that's important to me whenever I do a project like this.
Theme 1b: Learning and personal growth	I thought Paul was an important part of the Earthwatch trip. If the only thing I did was cut plants, people would be a little, and myself included, like it wasn't a very well-rounded experience. He helped make it a well-rounded experience....There is no reason we need to know about the history, the geology, those aspects, that's sort of extra. It augments the tourist part of the experience. Often times you feel like you are a tourist, as well as being just a worker. If we just did the project – we learn to identify plants, we learn to use GPS – I think people would feel

	<p>perhaps like there was something missing. They are missing things all around them that they don't have time to appreciate. So there was time in the experience to sample a variety of things present all around us. It's not important to the trip, it's morale, basically. Depending on what your objective is. If your objective is to run a successful Earthwatch trip, it's important. If your objective is to chop plants, they're not important. It's moral building. It's important.</p> <p>I could happily have done a day or a day and a half of controlling weeds, and after that the experience was...not a lot there really...chopping sauco from an educational experience, was a short lived thing.</p> <p>The repetitiveness of the work. But I don't want to sound too negative there because it had to be done, but there was a small learning curve in the skills.</p>
Theme 1c: Social interaction	<p>Not getting the cultural experience. Like on my Mongolian project, we actually had a Mongolian barbecue and we went over to some of the folks houses in the area. They're Yurts and we saw actually where they lived and that kind of thing. We didn't get actually get a chance to visit one of the people who lived in the Galápagos.</p> <p>I expected a bigger range of people from the Earthwatch program itself, but that was just the particular of the dates that we were going, there were only three of us.</p>
Theme 1d: Breaking out of the routine	<p>One of my needs when I come back is to rest as soon as I can. So any chance I can do that, as a hard-working professional that's going to be attractive to me. I need a break...doing something that's not mentally stressful...For instance, here's a pet peeve with Earthwatch: I've been in situations where the daily cost for our accommodations was \$3/day. They still doubled people up. I think it's kind of nice, with Earthwatch, when you are working with someone all day long, to have your own space. So, I don't know what the finances are, here, but when there was an option for a single supplement I was all over it. Because I knew, for that respite, I can't have a roommate for which things are not happening well. I can't even risk it. It would probably be fine, I usually like meeting other people. But, to help guarantee that this would be a good experience, for my roommate as well as me, a single supplement would make it.</p> <p>I think, right at the beginning, it felt as though every single moment was timetabled. One of the reasons for taking a break from teaching for me was not to be timetabled. And it's just, for a short while. But I personally have to have a cut-off point, then it's my time...a quiet, contemplative time.</p>
Theme 1e: Making a difference	<p>What I really needed is: it would have been good to have seen some plotted results. Or if we could have found time to look at one of the earlier transects. What is it like, six months on, or something like that. What I'm hoping for is lots of information with results and so on. When we were waiting and made the decisions and signed up to come, we were always hoping to see something in the Earthwatch bulletin about the project, but there wasn't compared to the others, there was nothing about you know...updates and volunteers. I mean, I know it would have been superficial, "eliminated 10,000 sauco" or something....To see where the project is so far, rather than focusing our little transects and hacking away....And some reasons for optimism, but I'll be looking for those hopefully, that we're going to be kept in touch, with a follow-up.</p>
Theme 1f: Exploration	<p>I needed more help before I went to plan my own private, personal activity so that I could maximize my experience in the Galápagos.</p> <p>Well, I'm just very happy that we were given those weekends to do the day trips. But also just being out in the field. And you know there was that day we were just sitting there after lunch waiting for the taxi and that flycatcher was right here, it was really neat to be able to have those types of birds be right there.</p>

Theme 2: Traveling to a unique location	
Theme 2: Traveling to a unique location	I've run out of places I want to go that have Earthwatch trips. So, I want to go to Scotland, but they don't have one there, I want to go to Ireland, they don't have one there. They have one in England, it's a Roman Fort I might try. And I don't have my Scuba certificate anymore, and I don't want to go through that to do the Giant Clams of Tonga.

Discussion

I designed this study primarily to explore the motivations of the participants in the Galápagos EW Expedition and learn how individuals benefited from this experience. I found that the participants volunteered for several reasons and benefited in numerous ways. Specifically, volunteers wanted to learn about the natural environment, explore a new location at their own pace, contribute to the conservation of the Galápagos, make a difference, see the results of their efforts, be part of a group, meet likeminded people, and increase others' awareness of environmental issues. While some of these motivations and benefits were identified at all three time periods, others were not (Table 17).

Table 17. Expedition volunteers' motivations, immediate benefits, and later benefits.

	Motive	Immediate Benefit	Later Benefit
Contributing to future generations	X	X	X
Learning and personal growth	X	X	Learning through exploration
Exploration	X	X	
Making a difference	X	X	Meaningful involvement
Breaking out of the routine	X		
Professional growth	X		
Social interaction			X

Contributing to future generations was consistently reported as a motive, an immediate benefit, and a benefit later. Initially, learning and personal growth and exploration were identified as distinct motivations/benefits, but later they were viewed as interlinked benefits.

While participants expressed making a difference as an important motive and early benefit, they later expressed deriving related benefits in terms of being meaningfully involved. These two benefits are similar in that they both involve being useful and feeling a sense of accomplishment. However, volunteers associated making a difference with seeing the results of one's individual efforts, whereas later they felt they benefited by meaningfully engaging in a group effort. These benefits appear to describe a similar construct characterized as meaningful action by Kaplan and Kaplan (2003) in the Reasonable Person Model. The experiences volunteers describe relating to participating effectively and feeling a sense of competence (e.g. "I think the challenge was at the beginning, because you didn't know what you were going into...but, you know, it's given us the confidence to (participate in another expedition)") serve as examples of what Kaplan and Kaplan might characterize as meaningful action. The authors suggest that individuals are motivated to participate, to meaningfully engage, and desire a sense of self-efficacy. Further, meaningful action plays an important role in fostering environmental responsible behavior.

Note that while breaking out of the routine and professional growth were reported as motivations (although less important ones than the others), participants did not identify these motivations as benefits either immediately after the Expedition or later. Last, social interaction was not initially recognized as a distinct benefit (although certain social measures loaded on learning and personal growth), but emerged as one over time. As suggested by the above, volunteers' motivations and benefits consisted of a mix of both self-interest and altruism.

These motivations and benefits were in fact quite consistent across volunteers' demographics and background with only a few differences between younger and older volunteers. Older volunteers placed greater importance on altruistic motivations and benefits than younger ones. Specifically, seniors were more likely to want to make a difference and contribute to the conservation of the Galápagos for future generations. These findings are consistent with Wright and Lund's (2000) overview of the studies that have examined aging and the environment. The authors argue that while most of the discussions about issues of gerontology have focused on economics and health care, stewardship of natural resources should also be considered. They cite a study by the AARP that found that respondents over the age of 65 were significantly more likely to strongly agree that a clean environment is one of the most important legacies they can leave their children than respondents aged 50-64. Additionally, the study showed that individuals age 65 or older were more likely to purchase environmentally friendly products than any of the younger age groups.

While I learned that this group of volunteers engages in a range of conservation behaviors, there were limited data to suggest that participation in the Expedition changed their behaviors. While intentions to engage in environmental behaviors were higher than what volunteers reported to engage in following the Expedition, self-reported behavior means were higher in almost all instances after the Expedition than before (although not significantly so). The exception was that they reported sharing their experiences through speaking informally more frequently than they intended to. The reason for few significant differences in behavior before and after may have been due to the study's small sample size.

In addition, some data suggested that volunteers may have been more likely to join an organization that supports the Galápagos. Possibly, however, by foregoing membership in local or national conservation organizations. Further, as a result of their experience, volunteers perceived themselves as advocates for the conservation of the Galápagos, an advocacy that extends to sharing their understanding of conservation issues with others. These results are consistent with research that shows a link between participation in volunteer stewardship and attachment to natural areas and a desire to protect these areas (Ryan 1997; Ryan et al. 2000). These types of volunteer experiences may foster an attachment to the areas where they take place, and thus a commitment to their preservation.

As suggested by the above results, many of this study's findings are consistent with past research on volunteers. For example, the motivations/benefits related to contributing, learning, personal growth, interactions with wildlife, and professional growth were also important values to other international conservation volunteers (Campbell & Smith 2006; Galley & Clifton 2004).

This study's findings also provide some new insights into volunteers who participate in international conservation science and service projects. These volunteers have many of the same motivations and experience many of the same benefits as volunteers who participate in local conservation projects, such as the desire to learn and explore, contribute, and engage in meaningful activity (Ryan et al. 2000; Grese et al. 2001; Schroeder 2000; Aull 2004; Miles et al. 2000). However, they also differ from volunteers in local environmental stewardship in some significant ways. In this study, volunteers were very much attracted to participating in the Expedition because it enabled them to travel to a unique location without undesirable impacts to the natural or cultural environment that they associate with traditional tourism. Moreover, the motive to travel to a unique location suggests that volunteers in the Expedition view their participation as leisure. Additionally, volunteers emphasized the importance of learning, which has also been considered a leisure activity (Roggenbuck 1991). Research suggests there is an increase in interest in tourism that emphasizes learning about the natural environment (Eagles et al. 2002). By extension, this suggests that benefits associated with leisure are important aspects of the experience.

This thesis provides the basis for a more solid understanding of what motivates volunteers to participate in conservation science and service and how they benefit from these experiences. As a result of this study, we also have greater insight into how international volunteers' motivations and benefits may differ from those of local volunteers and into how older volunteers' motivations and benefits may differ from those of younger volunteers. However, this study's results have limited generalizability because they were obtained from a relatively small number of volunteers, in a particular Expedition, and in a unique location. More research on these types of volunteers is thus warranted. Given the growing number of seniors and Baby Boomers with the strong interest in volunteer tourism (NTA 2006), learning more about how to meet their specific needs seems particularly appropriate. For example, this study suggested that seniors may be reluctant to consider volunteering in conservation science and service projects because they are not confident that they can perform the necessary tasks. This finding is consistent with research on information processing that shows that people desire environments which they can easily navigate, which are understandable, and in which they feel competent (Kaplan 2000). Volunteers appear to have to balance their desire to explore and have new experiences with their uncertainty about their ability to be competent in a new environment. An understanding of these conflicting desires may allow organizations to address and resolve these concerns to support the greater

involvement and satisfaction of volunteers in general and that of senior volunteers specifically.

In addition to learning more about the needs of different types of volunteers such as seniors, it would be beneficial to learn more about what particular aspects of conservation science or service projects enable volunteers to experience different benefits. In this study, for example, many volunteers attributed their rich learning experience with the naturalist's lectures and interpretations.

Last, there are also a number of important questions surrounding volunteers' conservation behaviors that have not been addressed by researchers. To the best of my knowledge, for example, this study was the first that sought to determine if volunteer conservation experiences change participants' conservation behaviors. This study found limited evidence for such changes, suggesting that volunteer experiences per se may not lead to changes in participants' behaviors. Given that organizations like Earthwatch desire such changes among their volunteers, how can they change their Expeditions or the support they provide after these Expeditions to reach their goal? In this study, for example, several perceived benefits were correlated to self-reported conservation behaviors (e.g. the benefit contributing to future generations was linked with local individual and citizen behaviors). It would thus be interesting to learn more about the extent to which motive fulfillment or particular benefits may lead to changes in volunteers' conservation behaviors.

Implications

This study provided insights into volunteer motivations for, and benefits of, and needs presented by participation in the *Galápagos Invasion* Expedition as well as into their conservation behaviors. In light of these insights, I offer several recommendations for Earthwatch (EWI) and other organizations that involve volunteers in scientific field research internationally. The recommendations are aimed at providing these organizations with the understanding necessary to attract and retain volunteers as well as to better meet their goal of fostering further conservation behaviors. First, EWI may want to consider changing how it markets its Expeditions. Given that EWI's volunteers are likely to see themselves as tourists first and volunteers second, EWI should consider highlighting how its Expeditions enable volunteers to travel to unique locations and how these Expeditions provide richer learning opportunities than traditional tourism experiences. Moreover given these volunteers' concerns about the impacts of their travels, EWI could highlight how its Expeditions are less likely to degrade the environment or culture of the place volunteers visit. Similar to the carbon offset trend, EWI could consider marketing its Expeditions as "travel offsets." This concept builds on volunteers' desire to offset the environmental impacts of their travel, particularly in the context of climate change. Volunteers' attribute many of the benefits that they receive with Earthwatch providing an alternative to tourism, and these benefits could be highlighted given increasing interest in such benefits amongst travelers.

As indicated by these suggestions, I believe it is important that EWI not only continue to market the altruistic benefits associated with its Expeditions, but also focus on the personal benefits individuals may derive from these experiences. While there is no question that volunteers participate in these Expeditions for altruistic reasons (e.g., "The whole point in having EWI is that the scientist needs help"), they also participate in these experiences, for example, to learn and grow and break out of their routines. By highlighting both the altruistic and personal benefits volunteers may experience as a result of participating in its Expeditions, EWI may be able to attract and retain more volunteers.

Importantly, EWI should of course only market those benefits that it feels volunteers in its Expeditions are likely to experience. While many of the benefits desired by volunteers are likely to be inherent to particular Expeditions, other benefits may not be experienced without specific programming. In the case of the *Galápagos Invasion* Expedition, for example, volunteers' desire to break out of their routines was not fulfilled. Despite research revealing the restorative power of nature (Kaplan & Kaplan 2003), the results indicate that being in a natural environment was not sufficient for recovering volunteers' mental or physical fatigue, despite their interest in receiving benefits such as "rejuvenating my physical and mental well-being" related to breaking out of the routine. This is likely to have occurred due to insufficient opportunities for personal restoration, the physical intensity of the field

work, the demand on volunteers' attention during data collection, or the monotony of the field research. As suggested by one volunteer, more opportunities for personal exploration and reflection might have assisted volunteers in realizing this benefit. Given that restoration of mental fatigue has been linked with improving information processing (Kaplan & Kaplan 2003), it may be that ensuring experiences that meet this need also facilitate volunteers in realizing other learning-related benefits.

With regard to both its marketing and programming, EWI should also consider focusing more on the needs of senior volunteers. Baby Boomers are a growing and wealthy segment of the population that may have shown strong interest in participating in international volunteer opportunities (NTA 2006). This study confirms this finding, and suggests that while seniors are particularly interested in contributing to future generations and in making a difference but they are also concerned with their ability to perform physical outdoor research activities. Incorporating pictures of senior citizens engaged in Expedition activities and including encouraging quotes from past senior citizen participants may help to alleviate potential senior citizens' concerns. Research projects that offer a range of activities with differing levels of physical intensity may also give volunteers confidence that they will be able to participate and contribute.

As suggested by the study's results and the above suggestions, I highly recommend that EWI definitely consider the Galápagos again for future Expeditions. Volunteers reported being highly motivated by, and deriving many benefits from this particular Expedition's location in the archipelago. In particular, volunteers valued the Galápagos as a world renowned birthplace of evolutionary biology and the many opportunities for close encounters with tame wildlife. An EWI Expedition to the Galápagos is thus likely to attract volunteers.

Last, EWI states that the organization's goal is to "inspire volunteers to create 35,000 local community action projects." Based on this study's results it is not clear that the organization is currently meeting this goal. In other words, EWI should not assume that volunteers will engage in more conservation actions after the Expedition including in community action projects. The volunteers in this study already engaged in a variety of conservation behaviors and there was insufficient evidence to conclude that their actions changed as a result of participating in the Expedition. At the same time, EWI could capitalize on volunteers' interest to serve as advocates by sharing their experiences through different media and other means. EWI could consider exploring how it can support volunteers to engage in these and other conservation behaviors after the Expedition such that volunteers are more likely to follow through on the behavioral intentions EWI's Expeditions appear to inspire.

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Appendices

Appendix 1: Additional Behavior Results.

Were there differences in intentions prior to participating in the Expedition (Time 1) and intentions immediately following participation in the Expedition (Time 2)?

In addition to determining if there were differences in the frequency of self-reported environmental stewardship behavior before and after the Expedition, I wanted to explore the relationships between participants' intentions and their behaviors. I therefore first focused on this question on respondents' intentions.

I explored if there were differences in participants' intentions immediately before and after the Expedition (Time 1 versus Time 2) and also determined the correlations between these intentions. I learned that individuals' intentions to engage in environmental stewardship behavior immediately before and after the Expedition were similar. Out of 11 possible measures, I found only four significant differences (Table 9), two of these increases at ALPHA=.05 and two decreases at ALPHA=.10. The two intentions that increased were "Volunteer in an environmental stewardship project: nationally" (after mean=4.07 versus before mean=3.35, $p=.032$) and "Volunteer in an environmental stewardship project: locally (within the state where I live)" (after mean=4.81 versus before mean=4.21, $p=.092$). The two intentions that decreased were "Sharing my experiences of the Expedition through: speaking informally" (after mean=4.78 versus before mean=5.36, $p=.056$) and "Sharing my experiences of the Expedition through: news media" (after mean=2.37 versus before mean=3.13, $p=.069$). Not surprisingly in light of these results, I found that all of respondents' 11 intentions were significantly correlated and highly so (correlation range: .54 to .85) (Table 12).

Appendix 2. Pre-expedition questionnaire.

What motivated you to participate in this Earthwatch Expedition?

This questionnaire is designed to answer a research question that a University of Michigan graduate student is hoping to answer as part of her Master's Thesis. By answering the following questions, you will further the understanding of the motivations for participation in Expeditions such as the Earthwatch Galápagos Invasion Expedition, particularly with regard to differences in motivations among different age groups. Participation is voluntary, and your answers will be kept confidential.

Please indicate to what extent that the following motivated you to participate in this Expedition.

Circle one response for each item.

	Not at All	Somewhat	Moderately	Much	Very Much	
1	1	2	3	4	5	helping to restore the natural areas of the Galápagos
2	1	2	3	4	5	contributing to scientific knowledge
3	1	2	3	4	5	feeling a sense of accomplishment
4	1	2	3	4	5	interacting with the local culture
5	1	2	3	4	5	rejuvenating my physical and mental well-being
6	1	2	3	4	5	being useful
7	1	2	3	4	5	preserving the Galápagos for future generations
8	1	2	3	4	5	achieving personal growth
9	1	2	3	4	5	learning about the unique plants / animals of the Galápagos
10	1	2	3	4	5	working alongside scientists
11	1	2	3	4	5	being in nature
12	1	2	3	4	5	learning about the natural or cultural history of the Galápagos
13	1	2	3	4	5	seeing the results of my efforts
14	1	2	3	4	5	exploring a potential new career
15	1	2	3	4	5	understanding the conservation issues that are facing the Galápagos

16	1	2	3	4	5	traveling to a unique location
17	1	2	3	4	5	breaking out of the routine
18	1	2	3	4	5	working with others to achieve shared goals
19	1	2	3	4	5	fulfilling my responsibility to future generations
20	1	2	3	4	5	gaining field experience
	Not at All	Somewhat	Moderately	Much	Very Much	
21	1	2	3	4	5	doing something challenging
22	1	2	3	4	5	having close encounters with wildlife
23	1	2	3	4	5	contributing to the conservation of the Galápagos
24	1	2	3	4	5	exploring the Galápagos at my own pace
25	1	2	3	4	5	contributing to the protection of a world heritage site
26	1	2	3	4	5	meeting people
27	1	2	3	4	5	having a sense of purpose
28	1	2	3	4	5	doing something with my hands
29	1	2	3	4	5	leaving a legacy for future generations
30	1	2	3	4	5	contributing my own skills and talents to the conservation of the Galápagos
31	1	2	3	4	5	learning new skills
32	1	2	3	4	5	making a noticeable difference
33	1	2	3	4	5	having fun
34	1	2	3	4	5	interacting with different age groups
35	1	2	3	4	5	other (please describe):

	Extremely Unlikely	Quite Unlikely	Slightly Unlikely	Neither	Slightly Likely	Quite Likely	Extremely Likely	Not Applicable	
36	1	2	3	4	5	6	7	NA	<u>Within the next 6 months I intend to:</u> write letters to support native species protection
37	1	2	3	4	5	6	7	NA	become a member of an organization that supports conservation of the Galápagos
38	1	2	3	4	5	6	7	NA	weed <u>invasive</u> species from my yard
39	1	2	3	4	5	6	7	NA	plant <u>native</u> species in my yard
40	1	2	3	4	5	6	7	NA	participate in another Earthwatch Expedition

	Extremely Unlikely	Quite Unlikely	Slightly Unlikely	Neither	Slightly Likely	Quite Likely	Extremely Likely	Not Applicable	
									<u>Within the next 6 months I intend to:</u> volunteer in an environmental stewardship project:
41	1	2	3	4	5	6	7	NA	locally (within the state where I live)
42	1	2	3	4	5	6	7	NA	nationally
43	1	2	3	4	5	6	7	NA	internationally
									share my experiences of the Expedition through:
44	1	2	3	4	5	6	7	NA	speaking
45	1	2	3	4	5	6	7	NA	news media
46	1	2	3	4	5	6	7	NA	presentations

	NEVER	RARELY	OCCASIONALLY	OFTEN	Very Frequently	
47	1	2	3	4	5	written letters to support native species protection
48	1	2	3	4	5	become a member of an organization that supports conservation of the Galápagos
49	1	2	3	4	5	weeded <u>invasive</u> species from my yard
50	1	2	3	4	5	planted <u>native</u> species in my yard
51	1	2	3	4	5	participated in another Earthwatch Expedition volunteered in an environmental stewardship project:
52	1	2	3	4	5	locally (within the state where I live)
53	1	2	3	4	5	nationally
54	1	2	3	4	5	internationally

In the past, I have:

I am currently a member of the following organizations:

	No	Yes	
55	1	2	an organization that supports the conservation of the Galápagos
56	1	2	a <u>local</u> organization that protects the environment
57	1	2	a <u>national</u> organization that protects the environment
58	1	2	an <u>international</u> organization that protects the environment

About you:

Are you retired? No _____ Yes _____

What is / was your profession? _____

What year were you born? _____

What is your gender? Male _____ Female _____

What is your country of citizenship? _____

Were you participating in the Expedition as part of a teacher or corporate fellowship? No _____ Yes _____

If so, please describe: _____

When was the last time you volunteered with an environmental stewardship program? Check one:

- _____ within the past month
- _____ within the past year
- _____ within the past two years
- _____ more than two years ago

Other comments:

Thank you for participating in this survey.

Appendix 3. Immediate post-expedition questionnaire.

What benefits did you receive from participating in this Earthwatch Expedition?

This questionnaire is designed to answer a research question that a University of Michigan graduate student is hoping to answer as part of her Master's Thesis. By answering the following questions, you will further the understanding of the benefits of participation in expeditions such as the Earthwatch Galapagos Invasion expedition, particularly with regard to differences in motivations among different age groups. Participation is voluntary, and your answers will be kept confidential.

Please indicate to what extent that the following were benefits you received from participating in this expedition.

Circle one response for each item.

	Not at All	Somewhat	Moderately	Much	Very Much	
1	1	2	3	4	5	helping to restore the natural areas of the Galápagos
2	1	2	3	4	5	contributing to scientific knowledge
3	1	2	3	4	5	feeling a sense of accomplishment
4	1	2	3	4	5	interacting with the local culture
5	1	2	3	4	5	rejuvenating my physical and mental well-being
6	1	2	3	4	5	being useful
7	1	2	3	4	5	preserving the Galápagos for future generations
8	1	2	3	4	5	achieving personal growth
9	1	2	3	4	5	learning about the unique plants / animals of the Galápagos
10	1	2	3	4	5	working alongside scientists
11	1	2	3	4	5	being in nature
12	1	2	3	4	5	learning about the natural or cultural history of the Galápagos
13	1	2	3	4	5	seeing the results of my efforts
14	1	2	3	4	5	exploring a potential new career
15	1	2	3	4	5	understanding the conservation issues that are facing the Galápagos

16	1	2	3	4	5	traveling to a unique location
17	1	2	3	4	5	breaking out of the routine
18	1	2	3	4	5	working with others to achieve shared goals
19	1	2	3	4	5	fulfilling my responsibility to future generations
20	1	2	3	4	5	gaining field experience
	Not at All	Somewhat	Moderately	Much	Very Much	
21	1	2	3	4	5	doing something challenging
22	1	2	3	4	5	having close encounters with wildlife
23	1	2	3	4	5	contributing to the conservation of the Galápagos
24	1	2	3	4	5	exploring the Galápagos at my own pace
25	1	2	3	4	5	contributing to the protection of a world heritage site
26	1	2	3	4	5	meeting people
27	1	2	3	4	5	having a sense of purpose
28	1	2	3	4	5	doing something with my hands
29	1	2	3	4	5	leaving a legacy for future generations
30	1	2	3	4	5	contributing my own skills and talents to the conservation of the Galápagos
31	1	2	3	4	5	learning new skills
32	1	2	3	4	5	making a noticeable difference
33	1	2	3	4	5	having fun
34	1	2	3	4	5	interacting with different age groups
35	1	2	3	4	5	other (please describe):

	Extremely Unlikely	Quite Unlikely	Slightly Unlikely	Neither	Slightly Likely	Quite Likely	Extremely Likely	Not Applicable	<u>Within the next 6 months I intend to:</u>
36	1	2	3	4	5	6	7	NA	write letters to support native species protection
37	1	2	3	4	5	6	7	NA	become a member of an organization that supports conservation of the Galápagos
38	1	2	3	4	5	6	7	NA	weed <u>invasive</u> species from my yard
39	1	2	3	4	5	6	7	NA	plant <u>native</u> species in my yard
40	1	2	3	4	5	6	7	NA	participate in another Earthwatch Expedition

	Extremely Unlikely	Quite Unlikely	Slightly Unlikely	Neither	Slightly Likely	Quite Likely	Extremely Likely	Not Applicable	<u>Within the next 6 months I intend to:</u>
									volunteer in an environmental stewardship project:
41	1	2	3	4	5	6	7	NA	locally (within the state where I live)
42	1	2	3	4	5	6	7	NA	nationally
43	1	2	3	4	5	6	7	NA	internationally
									share my experiences of the expedition through:
44	1	2	3	4	5	6	7	NA	speaking
45	1	2	3	4	5	6	7	NA	news media
46	1	2	3	4	5	6	7	NA	presentations

	Strongly Disagree	Disagree	Slightly Disagree	Neutral	Slightly Agree	Moderately Agree	Strongly Agree	Not Applicable	<u>As a result of participating in this expedition:</u>
									I know more about:
47	1	2	3	4	5	6	7	NA	invasive species
48	1	2	3	4	5	6	7	NA	endangered species
49	1	2	3	4	5	6	7	NA	conservation issues of the Galápagos
50	1	2	3	4	5	6	7	NA	other (describe):
51	1	2	3	4	5	6	7	NA	I am more skilled in (describe):
52	1	2	3	4	5	6	7	NA	I am satisfied with this Earthwatch expedition

Willingness to participate in a telephone call:

We would like to follow up with you. Are you willing to talk with us so we can learn more about your experience?

_____ No

_____ Yes → Name: _____

Telephone number: _____ Email address: _____

Best days/times to call: _____

Thank you for participating in this survey.

Appendix 4. Follow-up post-expedition questionnaire.

What benefits did you receive from participating in this Earthwatch Expedition?

This questionnaire is designed to answer a research question that a University of Michigan graduate student is hoping to answer as part of her Master's Thesis. By answering the following questions, you will further the understanding of the benefits of participation in expeditions such as the Earthwatch Galapagos Invasion expedition, particularly with regard to differences in motivations among different age groups. Participation is voluntary, and your answers will be kept confidential.

Please indicate to what extent the following were benefits that you received from participating in the expedition?

Circle one response for each item.

	Not at All	Somewhat	Moderately	Much	Very Much	
1	1	2	3	4	5	helping to restore the natural areas of the Galápagos
2	1	2	3	4	5	contributing to scientific knowledge
3	1	2	3	4	5	feeling a sense of accomplishment
4	1	2	3	4	5	interacting with the local culture
5	1	2	3	4	5	rejuvenating my physical and mental well-being
6	1	2	3	4	5	being useful
7	1	2	3	4	5	preserving the Galápagos for future generations
8	1	2	3	4	5	achieving personal growth
9	1	2	3	4	5	learning about the unique plants / animals of the Galápagos
10	1	2	3	4	5	working alongside scientists
11	1	2	3	4	5	being in nature
12	1	2	3	4	5	learning about the natural or cultural history of the Galápagos
13	1	2	3	4	5	seeing the results of my efforts
14	1	2	3	4	5	exploring a potential new career
15	1	2	3	4	5	understanding the conservation issues that are facing the

Galápagos

	1	2	3	4	5	
	Not at All	Somewhat	Moderately	Much	Very Much	
16	1	2	3	4	5	traveling to a unique location
17	1	2	3	4	5	breaking out of the routine
18	1	2	3	4	5	working with others to achieve shared goals
19	1	2	3	4	5	fulfilling my responsibility to future generations
20	1	2	3	4	5	gaining field experience
21	1	2	3	4	5	doing something challenging
22	1	2	3	4	5	having close encounters with wildlife
23	1	2	3	4	5	contributing to the conservation of the Galápagos
24	1	2	3	4	5	exploring the Galápagos at my own pace
25	1	2	3	4	5	contributing to the protection of a world heritage site
26	1	2	3	4	5	meeting people
27	1	2	3	4	5	having a sense of purpose
28	1	2	3	4	5	doing something with my hands
29	1	2	3	4	5	leaving a legacy for future generations
30	1	2	3	4	5	contributing my own skills and talents to the conservation of the Galápagos
31	1	2	3	4	5	learning new skills
32	1	2	3	4	5	making a noticeable difference
33	1	2	3	4	5	having fun
34	1	2	3	4	5	interacting with different age groups
35	1	2	3	4	5	other (please describe):

	Never						Very Frequently	Not Applicable	
	1	2	3	4	5	6	7	NA	
36	1	2	3	4	5	6	7	NA	<u>In the past 6 months I have:</u> written letters to support native species protection
37	1	2	3	4	5	6	7	NA	become a member of an organization that supports conservation of the Galápagos
38	1	2	3	4	5	6	7	NA	weeded <u>invasive</u> species from my yard
39	1	2	3	4	5	6	7	NA	planted <u>native</u> species in my yard
40	1	2	3	4	5	6	7	NA	participated in another Earthwatch Expedition volunteered in an environmental stewardship project:
41	1	2	3	4	5	6	7	NA	locally (within the state where I live)
42	1	2	3	4	5	6	7	NA	nationally
43	1	2	3	4	5	6	7	5	internationally

	Never						Very Frequently	Not Applicable	
	1	2	3	4	5	6	7	NA	
									<u>In the past 6 months I have:</u> shared my experiences of the expedition through:
44	1	2	3	4	5	6	7	NA	speaking informally
45	1	2	3	4	5	6	7	NA	news media
46	1	2	3	4	5	6	7	NA	presentations

	No	Yes	
47	1	2	<u>I am currently a member of the following organizations:</u> an organization that supports the conservation of the Galápagos
48	1	2	a <u>local</u> organization that protects the environment
49	1	2	a <u>national</u> organization that protects the environment
50	1	2	an <u>international</u> organization that protects the environment

	Strongly Disagree	Disagree	Slightly Disagree	Neutral	Slightly Agree	Moderately Agree	Strongly Agree	
								<u>As a result of participating in this expedition:</u>
								I know more about:
51	1	2	3	4	5	6	7	invasive species
52	1	2	3	4	5	6	7	endangered species
53	1	2	3	4	5	6	7	conservation issues of the Galápagos
54	1	2	3	4	5	6	7	other (describe):
55	1	2	3	4	5	6	7	I am more skilled in (describe):
56	1	2	3	4	5	6	7	I am satisfied with this Earthwatch expedition

Thank you for participating in this survey.

Appendix 5. Informed Consent Form.

Informed Consent Form
University of Michigan Institutional Review Board (IRB)

What motivates individuals to volunteer to conserve nature? What benefits do individuals derive from such volunteer experiences? How can experiences like the Galápagos Invasion Earthwatch expedition best meet volunteers' needs? In particular, how do motivations for participation and benefits received differ amongst volunteers of different ages? These are among the questions that Jennifer Young, a graduate student at the University of Michigan, seeks to answer through her thesis research. You are invited to be a part of this study due to your participation in the Galápagos Invasion Earthwatch expedition. All volunteers of the expedition (about 70) will also be invited to participate.

Your participation is voluntary. Participation involves questionnaires and interviews totalling approximately 2 hours of your time. This includes 40 minutes at the beginning of the expedition, 40 minutes at the end of the expedition, and we would like to follow-up with you about six months after the completion of the expedition requiring an additional 40 minutes of your time.

Your answers will be kept confidential. Only Jennifer Young and her academic advisors will have access to your responses. Your responses will not be linked to you personally; they will be reported anonymously with those of the entire group. Data will be coded to connect the pre, post, and 6 month follow-up data. The interview will be audio-taped. Within one year of the final interview and questionnaire the audiotape and interview notes will be destroyed; data will not be used in future studies. Only the results from the study will be shared with Earthwatch Institute.

You are free to decline to participate in the questionnaire and interview without penalty. You may also decline to answer any question or stop the interview at any time. You are free to decline to participate in the follow-up interview and questionnaire at the end of the expedition, as well as six months after. Even after you sign this form, you are free to withdraw from the study at any time. Declining to participate in the study or withdrawing from the study will not result in any negative consequences for you.

Essentially your participation poses no more than minimal risk to you as you will be completing a questionnaire and participating in an interview which will ask you questions about your volunteer experiences. The insights you will provide by participating will increase the value of the thesis and the scientific community will ultimately benefit from the knowledge obtained through this study.

If you have questions about the study, you may contact Jennifer Young (734) 262-4684, youngjen@umich.edu, or Dr. Michaela Zint, her lead academic advisor, at zintmich@umich.edu. Should you have questions regarding your rights as a participant in research, please contact the Institutional Review Board, Behavioral Sciences, 540 E. Liberty #202, Ann Arbor, MI 48104, (734) 936-0933, email: irbhsbs@umich.edu.

You will be given a copy of this form.

I have read and understand the information above. Jennifer Young has offered to answer any questions I may have concerning the study. I hereby consent to participate in this study.

Participant Signature

Date

I grant permission to be contacted regarding this study at the end of the expedition, as well as six months after for the follow-up study.

Participant Signature

Date

Also, please initial here ____ if you agree to the audio-taping of the interview. You may still participate in this study if you are not willing to have the interview recorded.

IRB: Behavioral Sciences

IRB Number: HUM00005221

Document Approved On: 9/24/2006

Appendix 6. Means and frequency tables: motive and benefit measures.

		Scale	%	%	%	%	%	n	mean	median	std	range	min	max
		1-5	1	2	3	4	5							
Q1	Pre	1-5	0	7	15	15	63	27	4.33	5	1.00	3	2	5
	Post	1-5	0	4	30	30	37	27	4.00	4	0.92	3	2	5
	Follow-up Grp 1 & 2	1-5						44	4.14					
Q2	Pre	1-5	4	4	22	41	30	27	3.89	4	1.01	4	1	5
	Post	1-5	0	26	22	30	22	27	3.48	4	1.12	3	2	5
	Follow-up Grp 1 & 2	1-5						44	3.84					
Q3	Pre	1-5	7	4	11	37	41	27	4.00	4	1.18	4	1	5
	Post	1-5	4	4	33	37	22	27	3.48	3	0.94	3	2	5
	Follow-up Grp 1 & 2	1-5						44	4.25					
Q4	Pre	1-5	4	26	26	19	26	27	3.37	3	1.25	4	1	5
	Post	1-5	0	15	37	33	15	27	3.48	3	0.94	3	2	5
	Follow-up Grp 1 & 2	1-5						44	3.95					
Q5	Pre	1-5	22	11	19	22	26	27	3.19	3	1.52	4	1	5
	Post	1-5	11	15	26	26	22	27	3.33	3	1.30	4	1	5
	Follow-up Grp 1 & 2	1-5						44	3.57					
Q6	Pre	1-5	4	0	11	41	44	27	4.22	4	0.93	4	1	5
	Post	1-5	4	4	15	37	37	26	3.56	4	2.71			
	Follow-up Grp 1 & 2	1-5						44	4.11					
Q7	Pre	1-5	0	7	7	22	63	27	4.41	5	0.93	3	2	5
	Post	1-5	0	4	30	37	30	27	3.93	4	0.87	3	2	5
	Follow-up Grp 1 & 2	1-5						44	4.23					
Q8	Pre	1-5	15	15	19	22	30	27	3.37	4	1.45	4	1	5
	Post	1-5	11	11	48	30	0	27	2.96	3	0.94	3	1	4
	Follow-up Grp 1 & 2	1-5						44	3.41					
Q9	Pre	1-5	0	0	4	33	63	27	4.59	5	0.57	2	3	5
	Post	1-5	0	0	4	37	59	27	4.56	5	0.58	2	3	5
	Follow-up Grp 1 & 2	1-5						44	4.57					
Q10	Pre	1-5	0	0	22	44	33	27	4.11	4	0.75	2	3	5
	Post	1-5	0	11	26	48	15	27	3.67	4	0.88	3	2	5
	Follow-up Grp 1 & 2	1-5						44	3.91					
Q11	Pre	1-5	4	0	15	12	69	26	4.42	5	1.03	4	1	5
	Post	1-5	4	0	19	19	59	27	4.30	5	1.03	4	1	5
	Follow-up Grp 1 & 2	1-5						44	4.57					
Q12	Pre	1-5	0	0	23	23	54	26	4.31	5	0.84	2	3	5
	Post	1-5	0	0	11	37	52	27	4.41	5	0.69	2	3	5
	Follow-up Grp 1 & 2	1-5						43	4.60					
Q13	Pre	1-5	7	26	22	37	7	27	3.11	3	1.12	4	1	5
	Post	1-5	7	4	33	41	15	27	3.52	4	1.05	4	1	5
	Follow-up Grp 1 & 2	1-5						43	3.53					
Q14	Pre	1-5	67	15	11	4	4	27	1.63	1	1.08	4	1	5
	Post	1-5	78	15	7	0	0	27	1.30	1	0.61	2	1	3
	Follow-up Grp 1 & 2	1-5						44	1.45					
Q15	Pre	1-5	0	4	26	37	33	27	4.00	4	0.88	3	2	5
	Post	1-5	0	0	19	37	44	27	4.26	4	0.76	2	3	5
	Follow-up Grp 1 & 2	1-5						44	4.45					
Q16	Pre	1-5	0	0	4	19	78	27	4.74	5	0.53	2	3	5
	Post	1-5	0	4	0	19	78	27	4.70	5	0.67	3	2	5
	Follow-up Grp 1 & 2	1-5						44	4.84					
Q17	Pre	1-5	22	19	7	30	22	27	3.11	4	0.53	4	1	5
	Post	1-5	11	4	15	26	44	27	3.89	4	1.34	4	1	5
	Follow-up Grp 1 & 2	1-5						44	4.00					
Q18	Pre	1-5	7	11	15	37	30	27	3.70	4	1.24	4	1	5
	Post	1-5	7	7	7	48	30	27	3.85	4	1.17	4	1	5
	Follow-up Grp 1 & 2	1-5						44	4.02					
Q19	Pre	1-5	4	11	22	33	30	27	3.74	4	1.13	4	1	5
	Post	1-5	7	15	26	33	19	27	3.41	4	1.19	4	1	5
	Follow-up Grp 1 & 2	1-5						44	3.68					
Q20	Pre	1-5	15	19	30	26	11	27	3.00	3	1.24	4	1	5
	Post	1-5	15	7	33	33	11	27	3.19	3	1.21	4	1	5
	Follow-up Grp 1 & 2	1-5						44	3.32					
Q21	Pre	1-5	7	15	11	33	33	27	3.70	4	1.30	4	1	5
	Post	1-5	7	15	19	30	30	27	3.59	4	1.28	4	1	5
	Follow-up Grp 1 & 2	1-5						43	3.79					
Q22	Pre	1-5	12	4	4	35	46	26	4.00	4	0.33	4	1	5
	Post	1-5	4	4	37	11	44	27	3.89	4	1.16	4	1	5
	Follow-up Grp 1 & 2	1-5						44	4.18					
Q23	Pre	1-5	0	7	11	30	52	27	4.26	5	0.94	3	2	5
	Post	1-5	0	4	30	30	37	27	4.00	4	0.92	3	2	5
	Follow-up Grp 1 & 2	1-5						44	4.25					
Q24	Pre	1-5	15	15	31	27	12	26	3.04	3	1.25	4	1	5
	Post	1-5	7	15	37	26	15	27	3.26	3	1.13	4	1	5
	Follow-up Grp 1 & 2	1-5						44	3.52					
Q25	Pre	1-5	0	7	7	33	52	27	4.30	5	0.91	3	2	5
	Post	1-5	0	4	26	41	30	27	3.96	4	0.85	3	2	5
	Follow-up Grp 1 & 2	1-5						44	4.14					
Q26	Pre	1-5	4	19	26	33	19	27	3.44	4	1.12	4	1	5
	Post	1-5	4	11	7	37	41	27	4.00	4	1.14	4	1	5
	Follow-up Grp 1 & 2	1-5						44	3.86					
Q27	Pre	1-5	7	19	19	22	33	27	3.56	4	1.34	4	1	5
	Post	1-5	7	7	11	48	26	27	3.78	4	1.16	4	1	5
	Follow-up Grp 1 & 2	1-5						44	3.77					
Q28	Pre	1-5	22	22	15	26	15	27	2.89	3	1.42	4	1	5
	Post	1-5	19	4	26	33	19	27	3.30	4	1.35	4	1	5
	Follow-up Grp 1 & 2	1-5						44	3.52					
Q29	Pre	1-5	4	8	24	36	28	25	3.76	4	1.09	4	1	5
	Post	1-5	4	15	19	41	22	27	3.63	4	1.12	4	1	5
	Follow-up Grp 1 & 2	1-5						44	3.66					
Q30	Pre	1-5	0	22	33	30	15	27	3.37	3	1.01	3	2	5
	Post	1-5	7	11	41	30	11	27	3.26	3	1.06	4	1	5
	Follow-up Grp 1 & 2	1-5						44	3.61					
Q31	Pre	1-5	12	8	15	35	31	26	3.65	4	1.33	4	1	5
	Post	1-5	7	15	26	37	15	27	3.37	4	1.15	4	1	5
	Follow-up Grp 1 & 2	1-5						44	3.66					
Q32	Pre	1-5	0	30	12	50	12	26	3.46	4	1.03	3	2	5
	Post	1-5	7	7	33	37	15	27	3.44	4	1.09	4	1	5
	Follow-up Grp 1 & 2	1-5						44	3.50					
Q33	Pre	1-5	4	15	22	22	37	27	3.74	4	1.23	4	1	5
	Post	1-5	4	7	11	30	48	27	4.11	4	1.12	4	1	5
	Follow-up Grp 1 & 2	1-5						44	4.02					
Q34	Pre	1-5	11	19	30	30	11	27	3.11	3	1.19	4	1	5
	Post	1-5	7	7	15	37	33	27	3.81	4	1.21	4	1	5
	Follow-up Grp 1 & 2	1-5						44	3.20					

Appendix 7. Means and frequency tables: intentions and behaviors.

		Scale	% 1	% 2	% 3	% 4	% 5	% 6	% 7	n	mean	median	std
Q36M	Pre Intention Grp 1	1-7	28	28	8	4	28	0	4	25	2.92	2	1.82
Q47M	Past Behavior Grp1	1-5	83	9	9	0	0	N/A	N/A	23	1.26	1	0.62
Q36B1	Post Intention Grp 1	1-7	19	27	19	4	19	12	0	26	3.12	3	1.73
Q36B2	Follow-up Behavior Grp	1-7									2.00		
Q37M	Pre Intention Grp 1	1-7	13	22	17	4	22	13	9	23	3.74	3	1.96
Q48M	Past Behavior Grp1	1-5	92	0	4	0	4	N/A	N/A	24	1.25	1	0.90
Q37B1	Post Intention Grp 1	1-7	8	12	4	8	31	27	12	26	4.69	5	1.81
Q37B2	Follow-up Behavior Grp	1-7									1.97		
Q38M	Pre Intention Grp 1	1-7	24	5	14	0	0	29	29	21	4.76	6	2.43
Q49M	Past Behavior Grp1	1-5	17	4	9	39	30	N/A	N/A	23	3.61	4	1.44
Q38B1	Post Intention Grp 1	1-7	20	0	5	0	5	30	40	20	5.2	6	2.35
Q38B2	Follow-up Behavior Grp	1-7									4.47		
Q39M	Pre Intention Grp 1	1-7	18	0	0	0	14	36	32	22	5.27	6	2.16
Q50M	Past Behavior Grp1	1-5	4	0	33	38	25	N/A	N/A	24	3.79	4	0.98
Q39B1	Post Intention Grp 1	1-7	14	5	9	5	5	23	41	22	5.14	6	2.25
Q39B2	Follow-up Behavior Grp	1-7									4.16		
Q40M	Pre Intention Grp 1	1-7	29	4	0	4	13	13	38	24	4.54	6	2.60
Q51M	Past Behavior Grp1	1-5	46	0	21	8	25	N/A	N/A	24	2.67	3	1.71
Q40B1	Post Intention Grp 1	1-7	23	8	4	4	4	23	35	26	4.65	6	2.51
Q40B2	Follow-up Behavior Grp	1-7									2.98		
Q41M	Pre Intention Grp 1	1-7	23	14	14	9	9	9	23	22	3.86	4	2.34
Q52M	Past Behavior Grp1	1-5	35	4	26	13	22	N/A	N/A	23	2.83	3	1.59
Q41B1	Post Intention Grp 1	1-7	12	20	4	4	12	20	28	25	4.56	5	2.29
Q41B2	Follow-up Behavior Grp	1-7									3.93		
Q42M	Pre Intention Grp 1	1-7	38	29	0	0	14	10	10	21	2.9	2	2.23
Q53M	Past Behavior Grp1	1-5	65	0	22	4	9	N/A	N/A	23	1.91	1	1.38
Q42B1	Post Intention Grp 1	1-7	16	20	8	16	20	8	12	25	3.76	4	2.01
Q42B2	Follow-up Behavior Grp	1-7									2.03		
Q43M	Pre Intention Grp 1	1-7	19	14	10	0	14	14	29	21	4.33	5	2.42
Q54M	Past Behavior Grp1	1-5	52	0	17	4	26	N/A	N/A	23	2.52	1	1.76
Q43B1	Post Intention Grp 1	1-7	8	28	8	4	20	12	20	25	4.16	5	2.14
Q43B2	Follow-up Behavior Grp	1-7									2.66		
Q44M	Pre Intention	1-7	5	9	14	5	9	5	55	22	5.36	7	2.11
N/A	N/A		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Q44B1	Post Intention	1-7	19	11	4	4	7	15	41	27	4.78	6	2.47
Q44B2	Follow-up Behavior Grp	1-7									5.81		
Q45M	Pre Intention	1-7	39	13	4	4	22	13	3	23	3.13	2	2.16
N/A	N/A		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Q45B1	Post Intention	1-7	48	15	15	4	15	0	4	27	2.37	2	1.74
Q45B2	Follow-up Behavior Grp	1-7									2.07		
Q46M	Pre Intention	1-7	13	9	17	0	9	30	22	23	4.61	6	2.19
N/A	N/A		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Q46B1	Post Intention	1-7	19	15	15	7	7	30	7	27	3.89	4	2.12
Q46B2	Follow-up Behavior Grp	1-7									2.88		

Appendix 8. Means and frequency tables: “As a result of participating in this Expedition...”

		Scale	1	2	3	4	5	6	7	n	mean	median	std
Q47B1	Post Grp 1	1-7	0	0	0	0	4	11	85	27	6.81	7	0.48
Q51B2	Follow-up Grp 1 & 2	1-7								44	6.5		
Q51B2	Follow-up Grp 1	1-7											
Q48B1	Post Grp 1	1-7	0	0	0	0	15	22	63	27	6.48	7	0.75
Q52B2	Follow-up Grp 1 & 2	1-7								44	6.09		
Q52B2	Follow-up Grp 1	1-7											
Q49B1	Post Grp 1	1-7	0	0	0	0	0	11	89	27	6.89	7	0.32
Q53B2	Follow-up Grp 1 & 2	1-7								44	6.8		
Q53B2	Follow-up Grp 1	1-7											
Q50B1	Post Grp 1	1-7	29	0	0	0	0	29	43	7	5	6	2.77
Q54B2	Follow-up Grp 1 & 2	1-7								13	6.54		
Q54B2	Follow-up Grp 1	1-7											
Q51B1	Post Grp 1	1-7	19	0	0	5	10	14	52	21	5.38	7	2.33
Q55B2	Follow-up Grp 1 & 2	1-7								39	5.85		
Q55B2	Follow-up Grp 1	1-7											
Q52B1	Post Grp 1	1-7	4	0	0	0	0	26	70	27	6.52	7	1.19
Q56B2	Follow-up Grp 1 & 2	1-7								44	6.52		

Appendix 9. Means and frequency tables: “I am currently a member of...”

Q55M	Past Membership Gr p 1	No.	2=Yes	92	8	N/A	N/A	N/A	N/A	N/A	25	1.08	1	2.77
Q47B2	Follow-up Membership Gr	No.	2=Yes	34	66	N/A	N/A	N/A	N/A	N/A	44	1.66		
Q47B2	Follow-up Membership Gr	No.	2=Yes			N/A	N/A	N/A	N/A	N/A				
Q56M	Past Membership Gr p 1	No.	2=Yes	46	54	N/A	N/A	N/A	N/A	N/A	24	1.54	2	0.51
Q48B2	Follow-up Membership Gr	No.	2=Yes	57	43	N/A	N/A	N/A	N/A	N/A	44	1.43		
Q48B2	Follow-up Membership Gr	No.	2=Yes			N/A	N/A	N/A	N/A	N/A				
Q57M	Past Membership Gr p 1	No.	2=Yes	48	52	N/A	N/A	N/A	N/A	N/A	25	1.52	2	0.51
Q49B2	Follow-up Membership Gr	No.	2=Yes	68	32	N/A	N/A	N/A	N/A	N/A	44	1.32		
Q49B2	Follow-up Membership Gr	No.	2=Yes			N/A	N/A	N/A	N/A	N/A				
Q58M	Past Membership Gr p 1	No.	2=Yes	68	32	N/A	N/A	N/A	N/A	N/A	25	1.32	1	0.48
Q50B2	Follow-up Membership Gr	No.	2=Yes	66	34	N/A	N/A	N/A	N/A	N/A	44	1.34		
Q50B2	Follow-up Membership Gr	No.	2=Yes			N/A	N/A	N/A	N/A	N/A				

Appendix 10. Means and frequency tables: Factors.

	Scale	n	mean	median	std	variable
<i><u>MOTIVES</u></i>						
Factor 1M	1-5	#	4.06	4.43	0.82	Contributing
Group 1						
Factor 2M	1-5	#	3.62	3.67	0.98	Learning
Group 1						
Factor 3M	1-5	#	3.24	3.4	1.12	Breaking Out
Group 1						
Factor 4M	1-5	#	3.70	4	0.84	Difference
Group 1						
Factor 5M	1-5	#	2.88	2.67	0.89	Professional
Group 1						
Factor 6M	1-5	#	3.88	4	0.78	Exploration
Group 1						
<i><u>BENEFITS_POST</u></i>						
Factor 1B1	1-5	#	3.82	4.05	0.81	Contributing
Group 1						
Factor 2B1	1-5	#	3.54	3.57	0.88	Learning
Group 1						
Factor 3B1	1-5	#	4.05	4.2	0.83	Exploration
Group 1						
Factor 4B1	1-5	#	3.38	3.5	0.90	Difference
Group 1						
<i><u>BENEFITS_FOLLOW_UP</u></i>						
Factor 1B2	1-5	#	4.04	4.33	0.92	Contributing
Groups 1 & 2						
Factor 2B2	1-5	#	3.77	4	0.85	Social Interaction
Groups 1 & 2						
Factor 3B2	1-5	#	3.94	4.3	0.89	Meaningful Involvement
Groups 1 & 2						
Factor 4B2	1-5	#	4.41	4.6	0.57	Learning through Explorat
Groups 1 & 2						

Appendix 11. Respondent professions.

Profession	Coded As
Dentist	Health Professional
Occupational Therapist - Health Service	Health Professional
Bookkeeper / Plant Pathologist	Natural Sciences Professional
High school Teacher / Counselor	Education Professional
RN	Health Professional
Hospital Dietitian	Health Professional
Dentist	Health Professional
Illustrator/Photographer	Artist
Forest Service Visitor Info Specialist & Volunteer Professional	Natural Sciences Professional
Consultant in Finance	Business Professional
Teacher	Education Professional
Teacher - Public School, Adults	Education Professional
Teaching	Education Professional
Lecturer in Science Education	Natural Sciences Professional
Manager - Disaster Recovery Services	Business Professional
Occupational Therapist, Nursing Home, Administrator, College Professor	Education Professional
Student	Education Professional
Police Officer	Business Professional
Farmer	Natural Sciences Professional
Free Lance Artist	Artist
Psychoanalyst	Health Professional
Research	Business Professional
Lawyer	Business Professional
Graphic Artist	Artist
Engineering / Manufacturing Management	Business Professional
Photographer	Artist
International Development Assistance, social and institutional development	Business Professional
HR	Business Professional
Student	Education Professional
Family Physician	Health Professional
Accountant/Teacher	Education Professional
Small Business Owner	Business Professional
Law / Environmental Conservation	Natural Sciences Professional
Corporate Responsibility Manager	Business Professional
Surgical Technology	Business Professional
Computer Programmer	Business Professional
Writer, Editor business, Finance	Business Professional

Biotech Lab Manager	Business Professional
Biology Professor	Natural Sciences Professional
Writer / Legislative Consultant	Business Professional
Teacher	Education Professional
Database Analyst	Business Professional
High School Counselor	Education Professional
Diplomat	Business Professional
Cook, Driver....Personal Assistant.	Business Professional
Teacher - college level	Education Professional
Court Reporter	Business Professional
Teacher	Education Professional
Environmental Scientist	Natural Sciences Professional
IT Manager	Business Professional
Teacher - 6th grade outdoor environmental center	Natural Sciences Professional
Business Consultant	Business Professional
Registered Nurse	Health Professional
Lecturer in Education	Education Professional
Physical Therapist and Raptor Rehabilitator	Natural Sciences Professional

Appendix 12. Respondent citizenship.

Citizenship	# Respondents
Australia	2
Canada	5
Czech Republic	1
Ireland	2
Romania	1
Russia	1
Scotland	1
Tanzania	1
UK	8
USA	33

Appendix 13. Group 1 motivation and benefit (at Time 2) factor correlations.

Factor		r	p-value
F1M & F1B1	Contributing to future generations	0.558	0.038
F2M & F2B1	Learning and personal growth	0.728	0.000
F6M & F3B1	Exploration	0.425	0.031
F4M & F4B1	Making a difference	0.494	0.010

Appendix 14. Intention and behavior correlations.

	Intention Time 1 & Intention Time 2 (Grp 1)		Intention Time 2 & Behavior Time 3 (Grp 1)		Behavior Time 1 & Behavior Time 3 (Grp 1)	
	r	p-value	r	p-value	r	p-value
Intention / Behavior Questions						
Write letters to support native species protection	.645	.001	.138	ns	-.434	ns
Become a member of an organization that supports conservation of the Galápagos	.469	.018	.010	ns	a	.000
Weeded invasive species from my yard	.665	.000	.111	ns	.661	.019
Planted native species in my yard	.815	.000	.276	ns	.322	ns
Participated in another Earthwatch Expedition	.537	.005	.355	ns	-.465	ns
Volunteered in an environmental stewardship project: locally (within the state where I live)	.714	.000	.158	ns	.565	.070
Volunteered in an environmental stewardship project: nationally	.849	.000	-.191	ns	-.283	ns
Volunteered in an environmental stewardship project: internationally	.826	.000	.096	ns	.195	ns
Shared my experiences of the Expedition through: speaking informally	.843	.000	.332	ns	N/A	N/A
Shared my experiences of the Expedition through: news media	.626	.001	-.017	ns	N/A	N/A
Shared my experiences of the Expedition through: presentations	.552	.006	.778	.001	N/A	N/A

Appendix 15. Significant difference: intentions and behaviors.

Intention / Behavior Questions	Behavior at Time 1 (Group 1)	Intention at Time 1	Intention at Time 2	Behavior at Time 3 (Group 1)	Behavior at Time 3 (Group 2)	Behavior Time 1 vs. Behavior Time 3 (Group 1)	Time 1 vs. Time 2 Intentions	Time 2 Intention vs. Time 3 Behavior (Group 1)	Grp. 1 vs. Grp. 2 Behaviors at Time 3
Write letters to support native species protection	1.26	2.92	3.30	1.27	2.61	ns	ns	p=.006	p=.009
Become a member of an organization that supports conservation of the Galápagos	1.25	4.08	4.81	1.40	2.77	ns	ns	p=.000	p=.035
Weeded invasive species from my yard	3.79	5.28	5.93	4.20	5.25	ns	ns	p=.081	ns
Planted native species in my yard	3.96	5.60	5.67	4.47	4.68	ns	ns	ns	ns
Participated in another Earthwatch Expedition	2.67	4.81	4.78	2.80	3.86	ns	ns	p=.027	ns
Volunteered in an environmental stewardship project: locally (within the state where I live)	2.83	4.21	4.81	3.43	4.08	ns	p=.092	ns	ns
Volunteered in an environmental stewardship project: nationally	1.91	3.35	4.07	2.00	2.58	ns	p=.032	p=.036	ns
Volunteered in an environmental stewardship project: internationally	2.52	4.65	4.44	2.43	3.24	ns	ns	p=.053	ns
Shared my experiences of the Expedition through: speaking informally	N/A	5.36	4.78	6.33	5.59	N/A	p=.056	p=.024	ns
Shared my experiences of the Expedition through: news media	N/A	3.13	2.37	2.20	2.27	N/A	p=.069	ns	ns
Shared my experiences of the Expedition through: presentations	N/A	4.61	3.89	2.67	3.07	N/A	ns	p=.001	ns

Appendix 16. Behavior over 14 months after participation in the Expedition (Groups 1 & 2).

Behavior Factors	% that indicated they participate	Gender	Retirement Status	Profession	Baby Boomers	Over 50	Over 60	Stewardship	Citizenship
Volunteering (Away From Home) (0-1.9)	54	ns	ns	ns	ns	ns	ns	ns	ns
Individual Behavior (Locally) (0-3.9)	72	ns	ns	p=.060	ns	ns	ns	ns	ns
Citizen behavior (0-1.9)	48	ns	ns	ns	ns	ns	ns	ns	ns
Sharing experiences through news media (0-1)	33	ns	ns	ns	p=.066	ns	ns	ns	ns
Sharing experiences through presentations (0-1)	55	ns	ns	ns	ns	ns	ns	ns	ns

Appendix 17. Benefit and behavior correlation (Group 1, Time 2).

Benefit Factors		Behavior 1: Volunteering (2.72)		Behavior 2: Individual (4.79)		Behavior 3: Citizen (2.09)		Behavior 4: News Media (2.07)		Behavior 5: Presentations (2.88)	
		r	p-value	r	p-value	r	p-value	r	p-value	r	p-value
F1	Contributing to future generations	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
F2	Learning and personal growth	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
F3	Exploration	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
F4	Making a difference	ns	ns	ns	ns	-.553**	.032	ns	ns	ns	ns

Appendix 18. Benefit and behavior correlation (Groups 1 & 2, Time 3).

Benefit Factors		Behavior 1: Volunteering (2.72)		Behavior 2: Individual (4.79)		Behavior 3: Citizen (2.09)		Behavior 4: News Media (2.07)		Behavior 5: Presentations (2.88)	
		r	p-value	r	p-value	r	p-value	r	p-value	r	p-value
F1	Contributing to future generations	ns	ns	.523**	.001	.269	p=.094	ns	ns	ns	ns
F2	Social interaction	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
F3	Meaningful involvement	ns	ns	.540**	.000	ns	ns	ns	ns	ns	ns
F4	Learning through exploration	ns	ns	.341*	.034	ns	ns	ns	ns	ns	ns