



Evaluating the impact of environmental volunteering on behaviours and attitudes to the environment

Rachel Hine, Jo Peacock and Jules Pretty
Department of Biological Sciences,
University of Essex, Colchester

Report for BTCV Cymru

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Contents

	Page
1. Key Findings	4
2. Background and context for research	10
2.1 The Role of BTCV	10
2.2 Context for the research	10
2.3 Purpose and aims of research	10
3. Methodology	12
3.1 Methodology	12
3.2 Sampling strategy	13
4. Results	14
4.1 Results	14
4.1.1 General population data and motivations	14
4.1.2 Connectedness to Nature	18
4.1.3 Environmental awareness and sense of environmental responsibility	18
4.1.4 Environmentally friendly behaviour	19
4.1.5 Qualitative responses	23
4.2 Relationships between volunteering for BTCV and environmental indicators	26
4.2.1 Relationships between environmental indicators	26
4.2.2 Relationship between length of time volunteering for BTCV and environmental indicators	27
4.2.3 Relationship between number of times volunteering for BTCV and environmental indicators	30
4.2.4 Relationship between frequency and regularity of volunteering fro BTCV and environmental indicators	31
4.2.5 Direct comparison longitudinal study	32
4.2.6 Other relationships	34
5. Conclusions	38
5.1 Discussion of evidence	38
5.2 Conclusions	41
5.3 Recommendations for future research	42
6. References	44

BTCV Cymru, co-funded by the Countryside Council for Wales (CCW) has commissioned Rachel Hine, Jo Peacock and Professor Jules Pretty, lead researchers of the green exercise programme at the University of Essex, to carry out research to investigate the impact of environmental volunteering on behaviours and attitudes to the environment. This study represents both the first and second phases of a two stage evaluation process. Two hundred and fifty one BTCV Cymru volunteers took part in stage 1 of our research and 152 took part in stage 2. Both the statistical findings and the qualitative narratives are included in this report.

Correspondence contact:

Rachel Hine, Assistant Director, Centre for Environment and Society, Department of Biological Sciences, University of Essex, Wivenhoe Park, Colchester CO4 3SQ. rehine@essex.ac.uk

The Green Exercise team:

The cross-disciplinary University of Essex project team is made up of academics from the Centre for Environment and Society and Centre for Sports and Exercise Sciences (both in Department of Biological Sciences) and is led by Professor Jules Pretty. This team has been leading research in the field of 'green exercise' since 2003 and is currently engaged in varied primary research into the health benefits of 'green exercise' and 'green care' – investigating the mental and physical health benefits of physical activities under exposure to different rural and urban environments.

The Centre for Environment and Society is also a leading authority on the use of Participatory Appraisal and Action Research methods to assess the needs and opinions of communities¹. We have developed innovative techniques that engage communities as active participants and this approach encourages community ownership of outcomes so that they are self-sustaining in the longer term.

Acknowledgements

The University of Essex and BTCV Cymru would like to thank all BTCV Cymru staff for their assistance with the research published in this report. We are very grateful to all the BTCV volunteers who completed the questionnaires and agreed to share details about their experiences. We are also very grateful for the continuing support of the Countryside Council for Wales (CCW) which enabled this research.

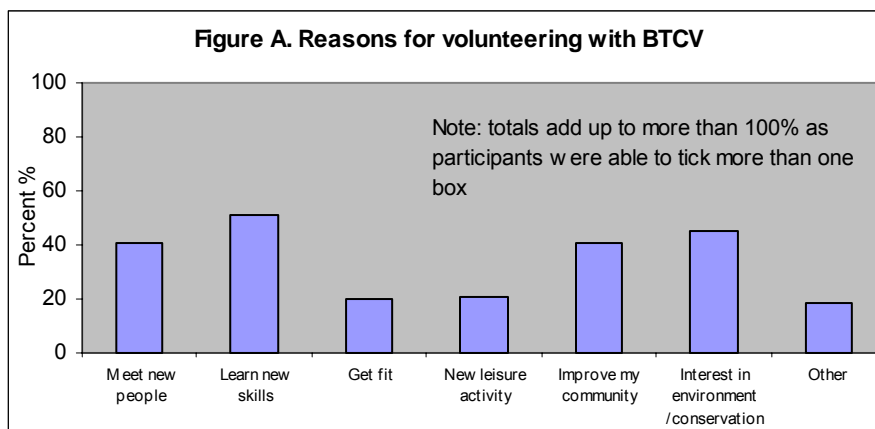
¹ With over 20 years experience of participatory assessment we have worked with a wide variety of organisations and target groups including work with countryside management projects, community groups, Healthcare Trusts, Housing Associations, Village Appraisals, Healthy Living Centres, Health Needs Assessments, sex and relationship education, local authority planning and urban regeneration both within the UK and internationally.

1. Key Findings

1.1 BTCV Cymru commissioned the University of Essex to carry out research to investigate the impact of environmental volunteering on behaviours and attitudes to the environment. The two stage evaluation process aimed both to obtain baseline data for a longitudinal study and to provide stand-alone findings for a snapshot survey. The first stage of the evaluation took place in summer 2006 and the second stage in late summer 2007. A total of 403 volunteers (251 in phase 1 and 152 from phase 2) from 28 different BTCV groups, took part in this research by completing the composite questionnaire. Of these 403 BTCV Cymru volunteers, 18 participants gave us their names in both surveys to enable repeated measures longitudinal comparison.

1.2 We developed a workable and practicable methodology specifically designed for this research. The study has provided baseline information on the personal and environmental outcomes of volunteering – principally whether volunteering with BTCV is likely to lead to an increase in connectedness to nature, which then may lead to an increase in both local and global environmental awareness and a change in behaviour to incorporate ‘environmentally friendly’ practices into everyday life. We have worked on the premise that in order to become more sustainable as a community (be that local or global) there is a need to take responsibility as an individual first - “think global and act local”. In addition this study also identifies key factors that motivate people to volunteer.

1.3 There was a relatively even gender mix in the study with 56% men and 44% women participating. Nearly a third of participants were aged between 21 and 30 years (30%) and 42% were aged between



31 and 50 years. Approximately half of the volunteers had been volunteering for less than 6 months and half for over 6 months and the motivations for volunteering for BTCV varied widely from an interest in conservation to a desire to meet people or to improve their local community (Figure A).

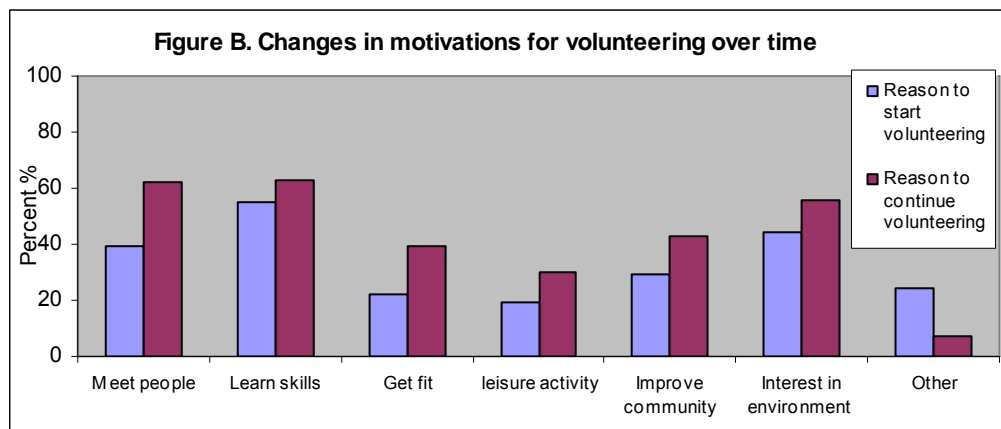
1.4 The phase 1 study highlighted the need to examine any changes in motivation from when participants first started volunteering with BTCV to the current time, often several years later. In the phase 2 study we also asked respondents to tell us why they continue to volunteer with BTCV. In addition to the reasons given for starting out, the options of ‘It makes me feel better’ and ‘Being outside in the fresh air’ were added. The 4 main reasons for continuing to volunteer were given as: i) ‘learning skills’ (63% of participants), ii) ‘the people’ (62%) iii) ‘being outside in the fresh air’ (58%) and iv) ‘an interest in the environment or conservation’ (56%).

- 1.5 The motivations for volunteering with BTCV Cymru were very much in keeping with what participants in the survey told us made volunteering ‘special’ for them. In total 287 ‘what is special?’ comments were collated and although there was much variation and personal insight, the comments fell into 6 key themes: i) natural capital benefits - helping the environment / value of conservation (83 comments), ii) natural capital benefits - local community (46 comments), iii) social capital benefits - meeting people (56), iv) education benefits - learning new skills and knowledge (36), v) health benefits - exercise and fresh air (12), vi) other comments – enjoyment, staff, outlooks etc (54 comments) (Box A).

**Box A. What is special about being involved with BTCV Cymru?
- Examples of comments from respondents**

- *"Gives me an interest in environmental issues and to learn more about things and places you would not otherwise"*
- *"It keeps me occupied and I meet new people"*
- *"Getting new skills and taking part in something bigger and more important"*
- *"BTCV provide people with an understanding of the environment and some of the changes which need to take place in order to assist in the conservation of our natural world"*
- *"Good fun, nice crowd of people It's healthy, fresh air, good surroundings"*
- *"It is nice to see people and the area grow and change for the better"*
- *"The coming of people together for a good cause. it strengthens the community, getting everyone involved to understand about conservation"*
- *"Helping the community, meeting people, learning new skills and working outdoors"*
- *"Everything you need - lots of fresh air and exercise, making new friends, meeting people and keeps you fit!"*
- *"You see things from a different angle; personally I am becoming very conscious of the state of the planet. I myself recycle as much as I can and my 2 young children know to do so too - you realise that people's actions affect the planet"*
- *"Making new friends"*
- *"Provides an environment whereby volunteers can acquire new skills, become more aware of environmental issues and allows them to meet new people"*
- *"By doing my little bit of coppicing in Cardiff I was able to help in the wider world"*
- *"The help and support BTCV give to community groups and how they contribute to sustainability - therefore it's special to belong to an organisation that cares about the environment"*
- *"It's very flexible and you can learn lots of new skills for free"*

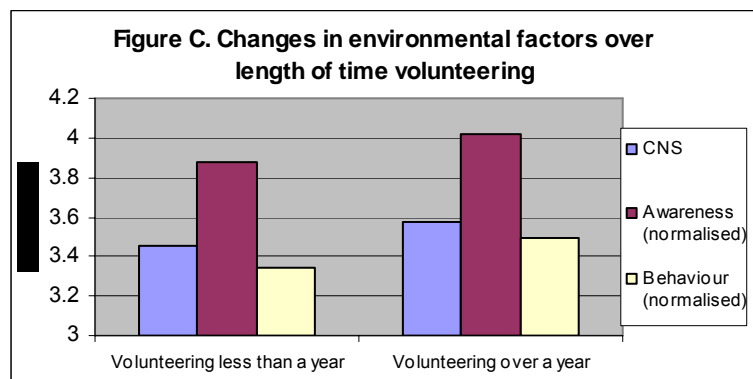
- 1.6 When the changes in motivation were examined in more detail in phase 2, we found that more participants appreciated the importance of the social element, the meeting up with fellow volunteers over time. Increases



were also observed with ‘keeping fit and active’ and ‘improving my community’. Changes in motivation between starting to volunteer and having volunteered for some time suggest that participants appreciate new and different reasons for volunteering with BTCV over time (Figure B).

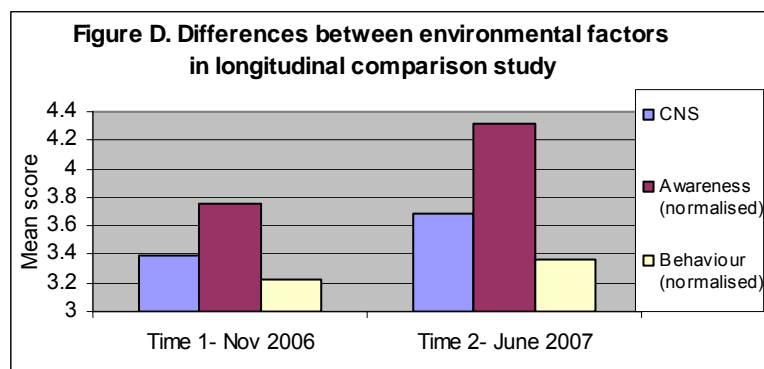
1.7 This study examined whether there is a link between volunteering with BTCV, increases in connectedness to nature, increases in both local and global environmental awareness, a change in behaviour by incorporating ‘environmentally friendly’ practices into everyday life and ultimately to advocate environmental protection. Results show that such a link exists, and with an increase in connectedness to nature, there is an increase in environmental awareness and responsibility and also an increase in environmentally friendly practice. A volunteer who has a high connectedness to nature score is also likely to have high environmental awareness and responsibility and is likely to be carrying out a number of environmentally friendly practices.

1.8 Connection to nature is considered to be an important predictor of ecological behaviour and subjective well-being. The connectedness to nature scale (CNS) was used in this study to assess whether volunteering with BTCV and being exposed to nature increases an



individual’s sense of feeling connected to nature. Looking at the surveyed group as a whole we found that BTCV volunteers were moderately connected to nature, as although scores varied from 1.71 to the highest score of 5, the average score was 3.50(SD 0.58). Connectedness to nature scores increased with length of time volunteering with BTCV Cymru, and although these changes in the main study were not found to be statistically significant, the increases in CNS scores observed in the 8 months between the repeated measures study, were very significant. Frequency of volunteering significantly increased the CNS scores and those participants who volunteered at least once a week were more connected to nature than those who volunteered less than once a week.

1.9 The environmental awareness and sense of environmental responsibility of the volunteers was measured by a specifically designed set of 11 statements. These statements referred to environmental issues of

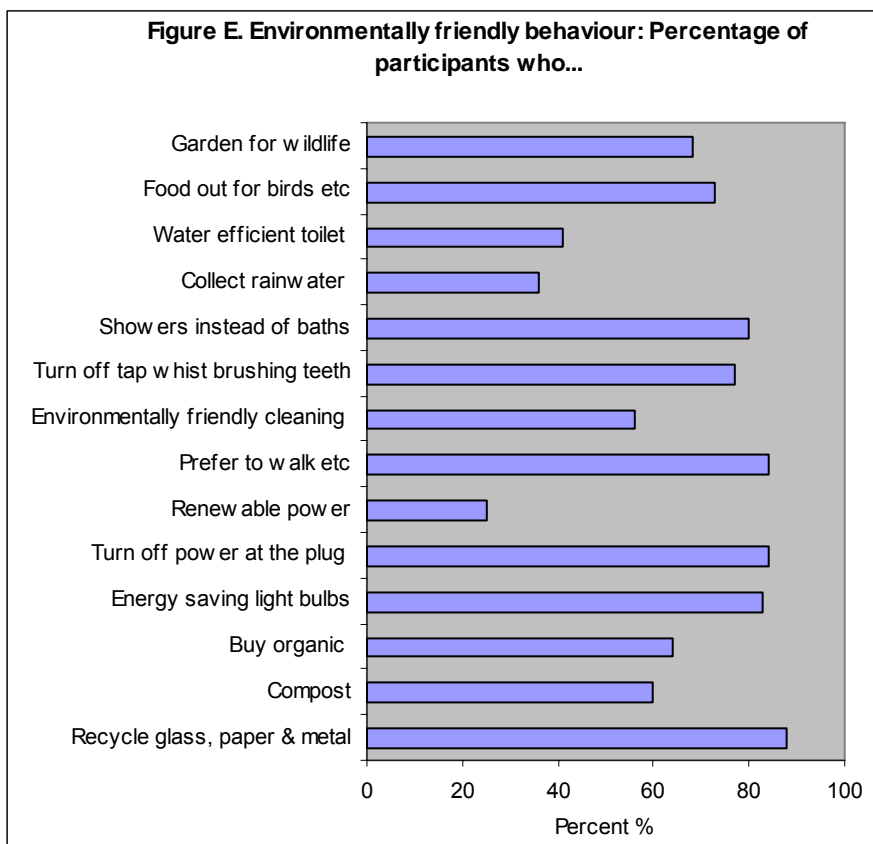


all scales starting with global environmental issues, UK or national issues, down to local or individual issues. A total environmental awareness/responsibility score was calculated which could be anywhere on the scale between the lowest score of 10 (indicating a low awareness and sense of responsibility) to the highest score of 50 (indicating a high level

of responsibility and awareness). The BTCV volunteer population scores in this survey ranged from the lowest of 23 to the highest of 50 with the average score being 39.28 (SD 5.88) which indicates a relatively high overall environmental awareness. Environmental awareness was shown to significantly increase with the length of time participants volunteered with BTCV (as shown in both the overall and repeated measures study) but was not significantly affected by the frequency of volunteering.

1.10 Changes in environmental awareness scores between November 2006 and summer 2007 were examined in more detail and the biggest increases in environmental awareness were observed at the local or individual responsibility level. This suggests that BTCV volunteers in this longitudinal study are becoming more aware of the role that they themselves can play in protecting the environment. At the UK level an increase in awareness of the need to conserve UK biodiversity and an increase in concern for over fishing in the North Sea were observed and at the global level the increase in awareness scores were seen concerning climate change and global biodiversity. These results are from a relatively small-scale longitudinal study and therefore it would be difficult to generalise about the whole population of BTCV Cymru volunteers. However, it is possible to draw some specific conclusions from this sample of volunteers and to surmise that through learning about the environment and conservation as a result of hands-on conservation work for BTCV, many volunteers have become more aware of local and UK environmental issues and what they can do as an individual to help make a difference.

1.11 The BTCV volunteers were also asked to detail the level and frequency of certain environmentally friendly lifestyle options and practices, measured by a specifically designed set of 14 questions. These questions referred to practices of all scales ranging from no cost options which are easily achievable by most people such as recycling glass, paper and metal, turning appliances off at the socket etc;



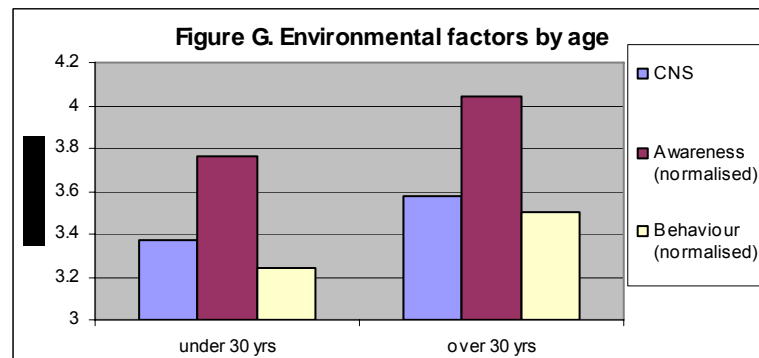
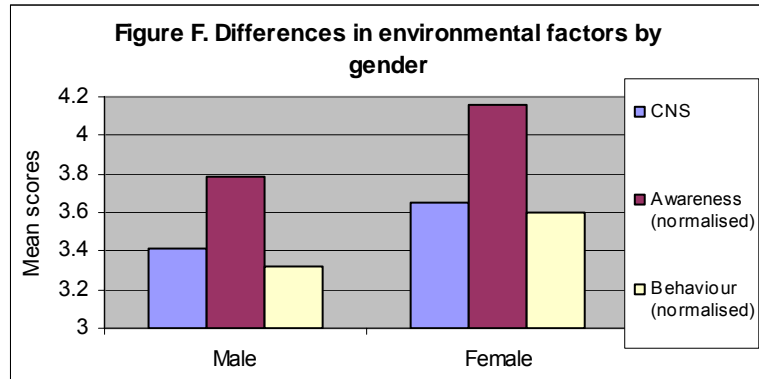
inexpensive options but which may be dependent on having garden or outside space (e.g. composting waste, wildlife friendly gardening etc); to options which

may require more effort or that have possible financial implications such as buying organic food and switching to an electricity company who provides renewable power (Figure E).

- 1.12 The top 3 environmentally friendly practices which participants stated that they carried out 'always' were: Recycling (49% of respondents), turning off the tap whilst cleaning teeth (46%) and taking showers instead of baths with 42% of respondents. The most popular practices that were carried out 'most of the time' were using energy saving light bulbs (27%), turning off the power at the plug and preferring to walk or use public transport rather than use a car (26% of volunteers). Both of these frequently carried out categories featured options which are largely easy to do and low or zero cost. The practice that stood out as being carried out less frequently, classed as 'occasionally', was buying organic food at 44% of the participant population
- 1.13 In this survey volunteers were given the choice of 5 reasons for not adopting environmentally practices ('never really thought about it', 'no time', 'too much effort'; 'too costly' or 'other'). The most commonly cited reason for not carrying out these practices was given as 'never really having thought about it', especially for i) using renewable power companies (49%) ii) having a water efficient toilet (38%) and iii) collecting rainwater (35%).
- 1.14 A total environmental behaviour score was calculated for each participant based on the responses to the 14 questions. This total environmental behaviour score could be anywhere on the scale between the lowest score of 0 (indicating no environmentally friendly behaviour) to the highest score of 42 (indicating a high frequency of environmentally friendly behaviour). The BTCV volunteer scores in this study scores ranged right across the scale from the lowest of 0 to the highest of 42, with the average score being 19.56 (SD 8.61) indicating a reasonable frequency of carrying out environmentally friendly practices.
- 1.15 The adoption of environmentally friendly behaviour was shown to significantly increase with the length of time participants volunteered with BTCV (as shown in both the overall and repeated measures study) and was also significantly increased with a rise in the frequency of volunteering.
- 1.16 The changes in environmental friendly practice scores in the small scale longitudinal study were also examined in more detail to see which particular practices had seen an increase over time. The 3 practices that saw the greatest increase in volunteer participation were i) recycling glass, paper and metal (a 26% increase from 58% of the volunteers to 84% of volunteers recycling); ii) having a water efficient toilet (22% increase); and iii) turning off the power to appliances off at the plug (21% increase from 64% of volunteers to 85%). These are all the relatively easy and low-cost environmentally friendly options, which support findings from the phase 1 study that found that people are more likely to adopt environmentally friendly behaviours and practices which are relatively easy and inexpensive to carry out.
- 1.17 This research also found that women volunteers had higher connectedness to nature and awareness of environmental issues and displayed more environmentally friendly behaviour than the male volunteers (Figure F). In addition, volunteers over 30 years of age demonstrated slightly higher connectedness to nature and environmental awareness

and participated in more environmentally friendly practices than the younger volunteers in this survey (Figure G).

1.18 In short, the BTCV Cymru research has indicated that a positive relationship exists between connectedness to nature, environmental behaviour and adoption of environmentally friendly behaviours and that there is an increase in these variables over time and frequency of volunteering with BTCV Cymru. The results of the direct longitudinal study also supported this and showed that the increase in all 3 variables (connectedness to nature, environmental awareness and environmentally friendly behaviour) over time is more pronounced, showing statistically significant results.



1.19 This study suggests that participating in conservation volunteering activities not only reconnects people to nature but also positively influences the environmental attitudes and behaviours of individuals, due to a range of motivators which provide the catalyst for change. The initial motivations for volunteering have been shown to change over time as individuals become more connected to nature, their environment and their fellow volunteers. The ethos of “*think global, act local*” comes into play as people start to make small changes to their nearby nature, whilst increasing their global awareness and conscience. This often leads to a desire to spend more time in greenspaces, to care more about their environment and to work to conserve and protect it against any potential threats. Participating in conservation activities also enhances both physical health and psychological well-being as a secondary consequence of behavioural changes, which in turn encourages people to participate more frequently, thus continuing the cyclical process.

1.20 Therefore, conservation activities such as those facilitated by BTCV Cymru generate substantial environmental, social, and physical and mental health benefits, indicating the potential not only for environmental conservation but also for a wider health and well-being dividend. Green space rich in biodiversity provides the ideal opportunity for outdoor recreation and acts as a valuable health resource for its users. The concept of green exercise group activities, such as conservation volunteering and ‘Green Gyms’, therefore has important implications for public and environmental health, and for a wide range of policy sectors.

2. Background and context for research

2.1 The Role of BTCV

The British Trust of Conservation Volunteers (BTCV) was established in 1959 to encourage people to take practical action to look after the environment, and this remains the key value to this day. BTCV wants to inspire people to i) value the environment, ii) take action to protect and improve it and to iii) live in a more sustainable manner, thus affecting global change through local action.

Today BTCV Cymru operates a number of different models of conservation volunteering across Wales with approximately 25,000 individuals participating each year. Volunteers can take part in community projects, environment and conservation projects, Green Gyms, BTCV holidays, training and corporate events and all of these models use different methods to engage and educate. Volunteers may have very different starting points in terms of their knowledge of and attitudes about the environment ranging from the complete novice to the seasoned enthusiast. In fact, what is meant by the term “environment” can also mean very different things to different people, ranging from the natural environment to the built environment, or in scale from wider global issues down to immediate local issues. BTCV has responded to the variety in volunteer attitudes by developing such a range of volunteering opportunities.

2.2 Context for the research

In the current funding climate, it is becoming increasingly important for organisations to prove the benefit and impact of their work. However, organisations such as BTCV are aware of the fact that although their work is long term in nature (changing people’s perceptions and actions takes time), available funding streams in contrast, work on much shorter timescales.

Sustainable development depends upon individuals valuing the environment and adapting their actions to minimise their impact or to make positive improvements to the environment around them. In order to continue to demonstrate the contribution to all aspects of sustainable development, there was a need to look at the key impacts of the work of BTCV, including:

- How people value the environment.
- The personal benefits of environmental activity.
- The environmental benefits of volunteering.
- How people’s attitudes and behaviours change in response to their environmental volunteering experiences.

2.3 Purpose and aims of research

BTCV Cymru want to establish a methodology to assess the impact of environmental volunteering on people’s behaviour and attitudes towards the environment, and are keen that developing such a methodology will allow them to build on existing anecdotal evidence by providing robust, quantitative evidence of change. BTCV are also keen to establish the motivators that are the catalyst for change. With this in mind, the aims of this research include:

- To develop a methodology to assess the impact of environmental volunteering on people's environmental attitudes and behaviours.
- To undertake a baseline survey of current attitudes and behaviours within BTCV volunteers.
- To provide information, over time, on the personal and environmental outcomes of volunteering – principally how involvement in volunteering changes people's attitude to the environment, how they value it and any subsequent changes in behaviour that occur directly as a result of their volunteering.
- To identify key factors which motivate people to make changes to their environmental behaviour.

3. Methodology

3.1 Methodology

For this evaluation, the University of Essex developed a methodology to assess the impact of environmental volunteering on people's environmental attitudes and behaviours. This included a baseline survey of current attitudes and behaviours within BTCV volunteers and a smaller scale longitudinal element of research to allow direct comparisons over the timescale of the research project. The methodology is workable and practicable and has been specifically designed to be relevant to the range of volunteering models at BTCV Cymru.

The methodology has been designed to provide information, over time, on the personal and environmental outcomes of volunteering – principally how involvement in volunteering changes people's attitude to the environment, how they value it and any subsequent changes in behaviour that occur directly as a result of their volunteering. In addition it also includes a process for identifying key factors that motivate people to make changes to their environmental behaviour, however small.

The principle evaluation tool in the BTCV Cymru survey is a composite questionnaire designed to address various key factors of environmental behaviour and awareness. The questionnaire has been designed to be used in the baseline study and then again at defined regular intervals to provide a longitudinal dimension to the research. The research examines whether volunteering with BTCV is likely to lead to an increase in connectedness to nature, which then may lead to an increase in both local and global environmental awareness, a change in behaviour to incorporate 'environmentally friendly' practices into everyday life and ultimately to advocate environmental protection. The methodology works on the premise that in order to become more sustainable as a community (be that local or global) there is a need to take responsibility as an individual first - "think global and act local".

The BTCV Environmental behaviour evaluation questionnaire includes:

- Questions to determine i) basic demographic information, ii) length of time volunteering with BTCV Cymru, iii) type of volunteering model and iv) initial motivation for
- Indicators of Social Capital (volunteer membership of environmental groups or organisations)
- Environmental awareness indicators (local, national and international)
- Environmental behaviour indicators for sustainability (based on elements of the UK Sustainable Development Strategy Framework indicators²)
- Standardised, well-recognised instruments such as the Connectedness to Nature Scale³
- Qualitative narrative responses

² To support the UK Government Sustainable Development Strategy there is a suite of 68 national sustainable development indicators. These include 20 UK Framework Indicators, which are shared by the UK Government and the devolved administrations in Scotland, Wales and Northern Ireland. The remaining 48 indicators in the strategy highlight additional priorities relevant to the UK Government Strategy and fall into one or more of the four priority areas: i) Sustainable consumption and production; ii) Climate change and energy; iii) Natural resource protection and enhancing the environment; and iv) Creating sustainable communities and a fairer world. Defra 2008.

³ The connectedness to nature scale is a *new measure of individuals' trait levels of feeling emotionally connected to the natural world*³. Connection to nature is considered to be an important predictor of ecological behaviour and subjective well-being. The scale is used in this context to assess whether volunteering with BTCV and being exposed to nature increases an individual's sense of feeling connected to nature. Mayer and McPherson Frantz 2004

Participants taking part in the research were also given the option of providing their names to allow for the longitudinal aspect of the study, that is, to be surveyed in the second stage of research in order to examine changes in behaviours and motivations over time.

3.2 Sampling strategy

Phase 1.

- The first part of the study represents the first stage of a longitudinal research project and has been designed to gather baseline information in order to compare the responses of subsequent studies over time. This study was also used as a pilot for the questionnaire to allow for any adaptation and alterations to the evaluation tool deemed necessary after stage one of the research.
- The minimum sample size for the first research stages was 200 volunteers, although a smaller sub-sample of volunteers is expected in subsequent studies
- All types of BTCV volunteering options were included in the evaluation (Green Gyms, Community projects, local days out etc.)
- BTCV Cymru staff were first given training and practical advice in research methods and questionnaire protocol by the University of Essex staff to ensure sampling coherence. BTCV staff from all BTCV Cymru regions then administered the questionnaires to participants during volunteer sessions and all completed questionnaires were then returned to the University of Essex for analysis.

Phase 2.

- The second part of the study represents the second stage of the smaller scale longitudinal research project and contributes to the baseline information. Alterations were made to the evaluation tool as based on the results of the pilot questionnaire.
- As with phase 1 of the research, for phase 2 BTCV Cymru staff from all BTCV Cymru regions, over a range of different volunteering contexts, administered the questionnaires to participants during volunteer sessions and again all completed questionnaires were then returned to the University of Essex for analysis.

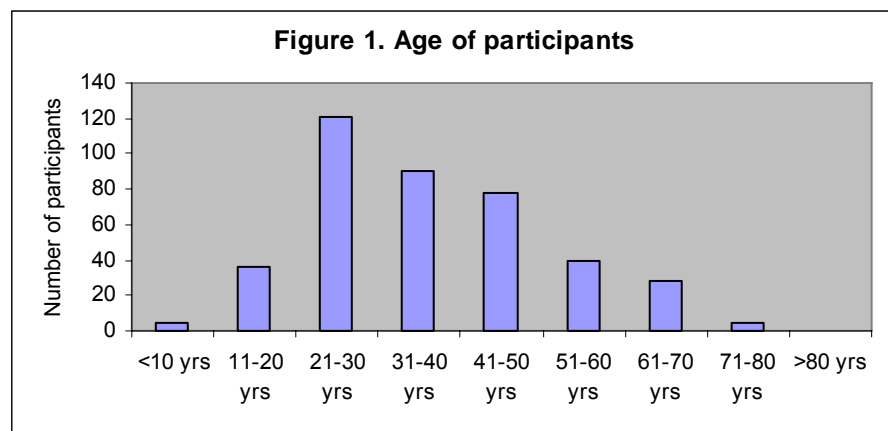
4. Results

4.1 Results

The two stage evaluation process aimed both to obtain baseline data for a longitudinal study and to provide stand-alone findings for a snapshot survey . The first stage of the evaluation took place in summer 2006 and the second stage in late summer 2007. A total of 403 volunteers (251 in phase 1 and 152 from phase 2) from 28 different BTCV groups, took part in this research by completing the composite questionnaire. Of these 403 BTCV Cymru volunteers, 18 participants gave us their names in both surveys to enable a direct longitudinal comparison.

4.1.1 General population data and motivations

There was a relatively even gender mix in the study with 56% men and 44% women participating. Nearly a third of participants were aged between 21 and 30 years (30%) and 42% were aged between 31 and 50 years (age of participants can be seen in Figure 1).



Respondents were then asked about their main activity. Approximately half (49%) replied that were working, 17% were not working and 11% were either working voluntarily or as carers. The main activity of volunteers is shown in Figure 2

The majority of volunteers were participating in either environmental conservation projects (57%) or community projects (37%) and 21% were attending Green Gyms. Examples of 'other' projects that volunteers were attending included the 'Environmentors' group, corporate 'away days', or volunteering as part of an alternative curriculum in schools or 'New Deal'.

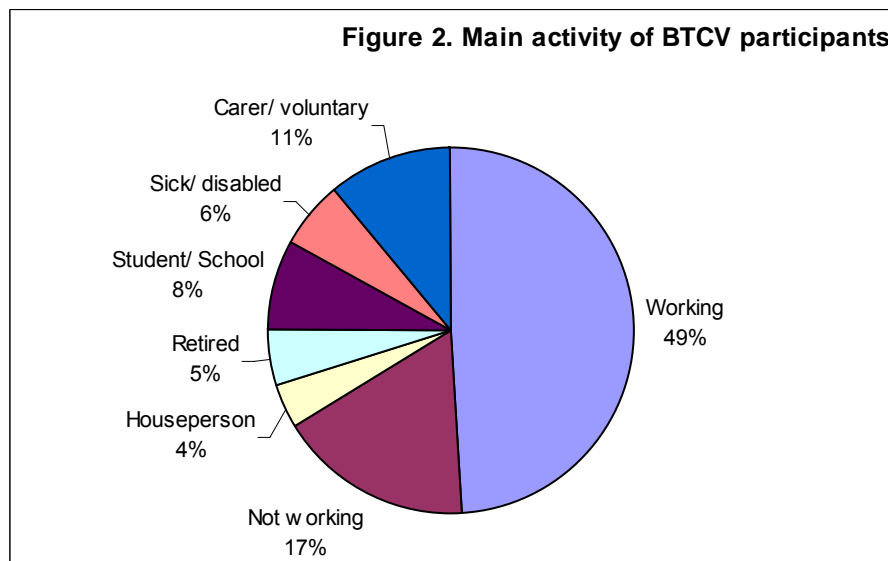
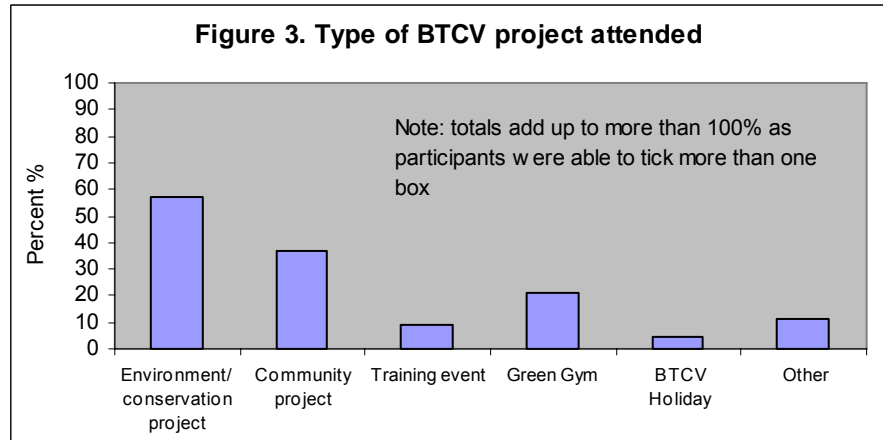


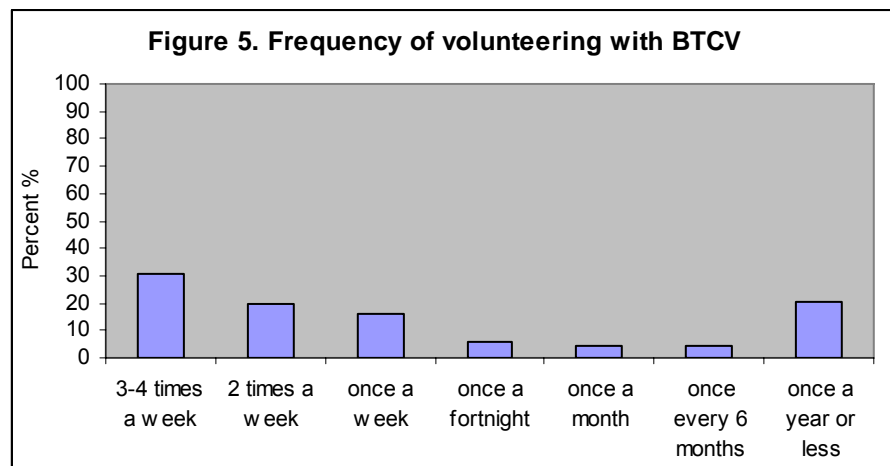
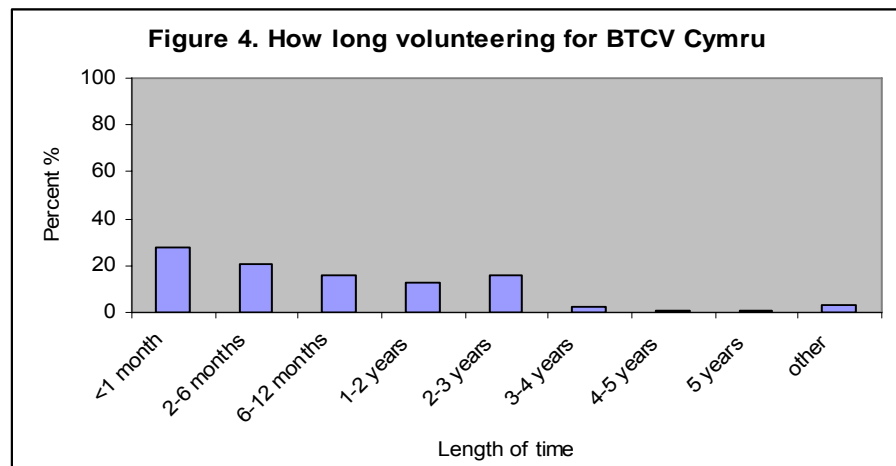
Figure 3 shows the types of BTCV projects attended by participants.

Volunteers were also asked how long they had been volunteering with BTCV Cymru and 49% of had been involved with BTCV for 6 months or less; 16% had been volunteering for between 6-12 months and 35% for over a year.



In phase 1 of the research we also asked volunteers how many times they had volunteered for BTCV Cymru (35% of participants had volunteered over 20 times for BTCV, 27% had been out 2-5 times and 24% had been out only once).

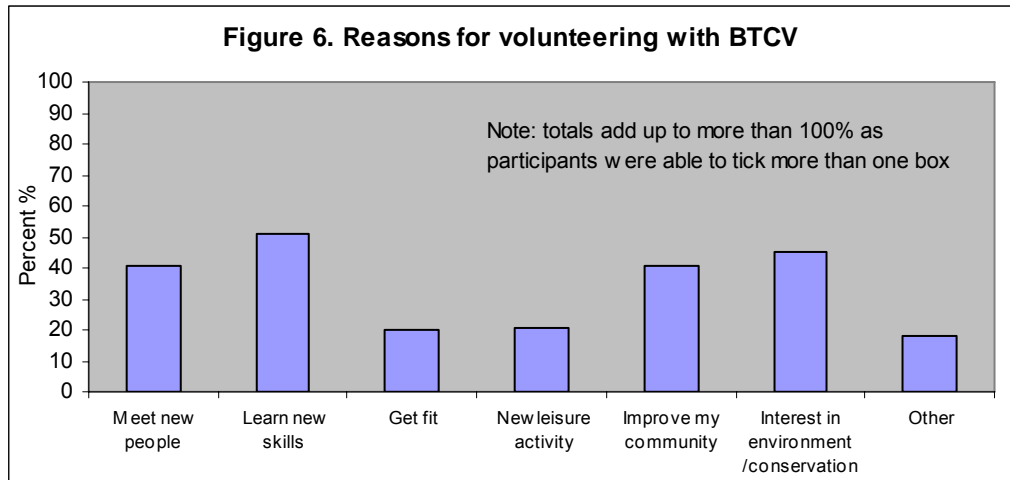
As this question had proved slightly ambiguous, in stage 2 of the research we refined the questionnaire and instead asked how frequently participants volunteered. The majority of volunteers (66%) attend at least once a week, 10% once a fortnight or once a month and 24% volunteer less often. More details of length of time participants have been volunteering and frequently they volunteer with BTCV Cymru can be seen in Figures 4 and 5 respectively.



The motivations for participants volunteering for BTCV varied widely. Participants were given the choice of 6 possible motivations or a chance to tell us themselves. A half of respondents (50%) started

volunteering with BTCV Cymru because they wanted to learn new skills; 45% volunteered due to

an interest in the environment and conservation; and 41% volunteered in order to meet new people and to improve their local communities. Figure 6 shows the reasons given for volunteering with BTCV

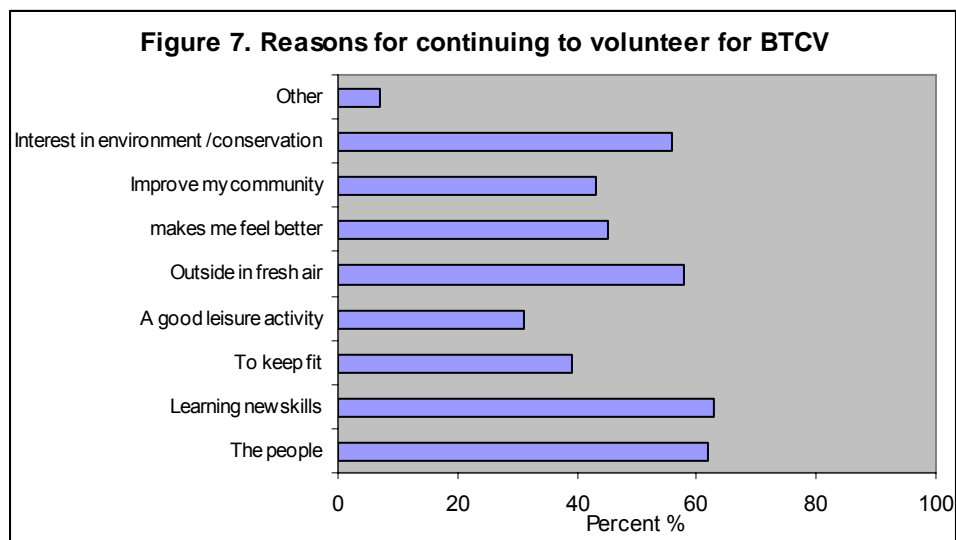


Cymru and Box 1 highlights some of the other reasons for volunteering given by the participants.

Box 1. Other reasons given for volunteering with BTCV Cymru

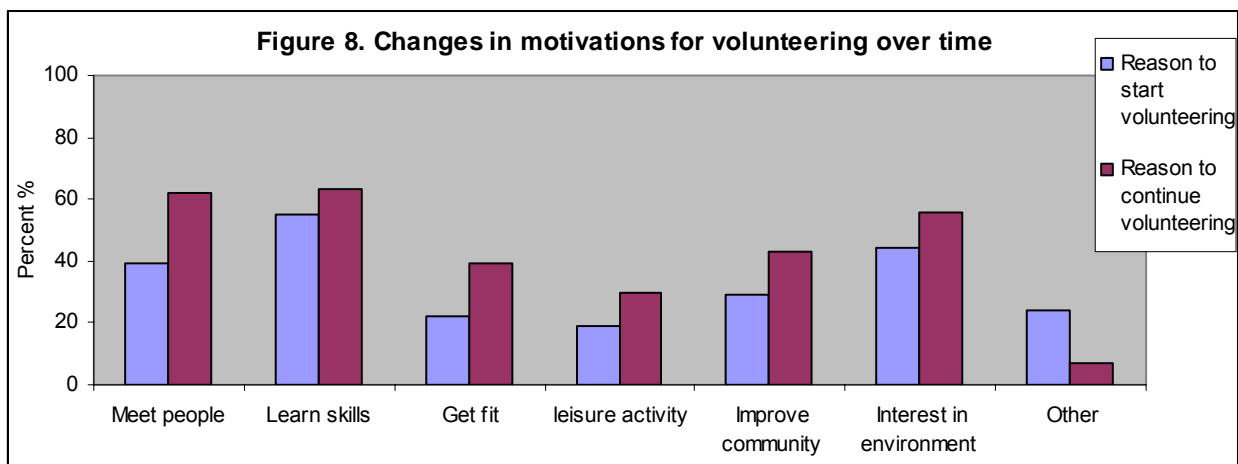
- *“to gain first hand experience of working within a charitable organisation”*
- *“to share skills and experience”*
- *“to get work experience”*
- *“my girlfriend won a garden make-over”*
- *“I did not volunteer I was sent by the courts”*
- *“To work together on a community project”*
- *“To develop environmental awareness in schools in community”*
- *“I’m attending to provide support for service user but I enjoy being involved”*
- *“As part of my treatment for occupational therapy”*
- *“Part of Gold Duke of Edinburgh award”*
- *“Experience of community work”*
- *“Team building opportunity and achieve something worthwhile”*
- *“To enjoy the outdoors, see new areas of the UK and to feel that I'm doing something worthwhile”*
- *“To rehabilitate”*
- *“To have fun”*

The phase 1 study highlighted the need to examine any changes in motivation from when participants first started volunteering with BTCV to the current time, often many years later. In the phase 2 study we also asked respondents to tell us

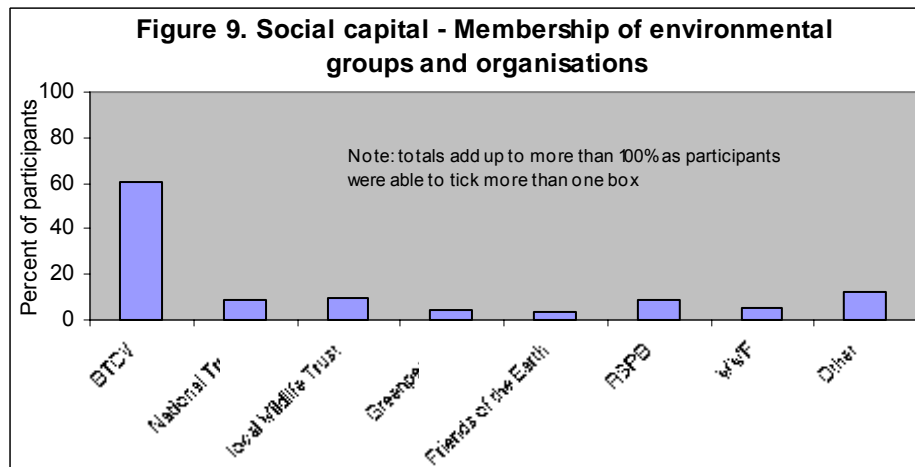


why they continue to volunteer with BTCV. In addition to the reasons given for starting out, the options of 'It makes me feel better' and 'Being outside in the fresh air' were added. The 4 main reasons for continuing to volunteer were given as: i) 'learning skills' (63% of participants), ii) 'the people' (62%) iii) 'being outside in the fresh air' (58%) and iv) 'an interest in the environment or conservation' (56%). The full results regarding motivations for continuance of volunteering with BTCV Cymru are shown in Figure 7.

The phase 2 study also examined the changes in motivation in more detail and found that more participants appreciated the importance of the social element, the meeting up with fellow volunteers over time. Increases were also observed with 'keeping fit and active' and 'improving my community' (see Figure 8). Changes in motivation between starting to volunteer and having volunteered for some time suggest that participants appreciate new and different reasons for volunteering with BTCV over time.



To examine social capital issues through involvement with other environmental groups or organisations, participants were also asked if they were a member of various environmental groups. These range from local groups such as local Wildlife Trusts and BTCV, national groups such as RSPB and The National Trust and international organisations such as Friends of the Earth, Greenpeace and WWF. Results can be seen in Figure 9.



4.1.2 Connectedness to Nature

The connectedness to nature scale is a *new measure of individuals' trait levels of feeling emotionally connected to the natural world*⁴. Connection to nature is considered to be an important predictor of ecological behaviour and subjective well-being. The connectedness to nature scale was used in this study to assess whether volunteering with BTCV and being exposed to nature increases an individual's sense of feeling connected to nature. The maximum possible score on this scale, which indicates the most connectedness to nature, is 5 and the lowest possible score, depicting the least connectedness to nature is 1. For the whole population of this study, the lowest score was 1.71 and the highest score was 5.00, with an average score of 3.50 (SD 0.58). Looking at the group as a whole it can be concluded that volunteers are moderately connected to nature.

Further analysis showing the correlation between connectedness to nature and other variables is illustrated in section 4.2.

4.1.3 Environmental awareness and sense of environmental responsibility

The environmental awareness and sense of environmental responsibility of the volunteers was measured by a specifically designed set of 11 statements. These statements referred to environmental issues of all scales starting with global environmental issues, UK or national issues, down to local or individual issues (see Table 1). Participants could answer on a 5-point scale ranging from strongly agree; agree; neutral; disagree or strongly disagree. For each statement a score of between 1 and 5 was awarded depending on response to statement (i.e. strongly agree = 5, strongly disagree = 1 or vice versa depending on statement bias). In addition a total awareness or responsibility score was calculated for each participant based on the responses to 10 out of the 11 questions. This awareness/responsibility score could be anywhere on the scale between the lowest score of 10 (indicating a low awareness and sense of responsibility) to the highest score of 50 (indicating a high level of responsibility and awareness). The BTCV volunteer population scores ranged from the lowest of 23 to the highest of 50 with the average score being 39.28 (SD 5.88) which indicates a relatively high overall environmental awareness.

Of all of the global scale statements, statement 1 (Climate change is one of the world's major environmental problems) achieved the highest positive responses, as 88% of respondents answered that they either strongly agreed or agreed with the statement. Statements 2 and 4 both achieved high responses of between 70% and 75% of the population. However statement 3 (I believe that environmental problems are less important than economic problems) was the most contentious because although just over half (57%) of the respondents disagreed and scored a 5 or a 4, the other half of the volunteers agreed or had no opinion.

Of all the 2 national/UK scale statements, statement 7 received the highest scores as 88% of the volunteers felt that "we should be doing more to prevent loss of rare species of plants and animals in the UK", whereas worries about over-fishing in the North Sea received lower scores with 59% of volunteers agreeing with the statement. On the local and individual level, statement 8 scored highest with 79% of participants in disagreement with the statement and for statement 10, 76% of volunteers said they were willing to change their lives to a more environmentally sustainable way of living.

⁴ Mayer and McPherson Frantz 2004

Table 1. Environmental awareness/ sense of environmental responsibility

Level or reasoning	Statements about environmental issues	Responses
Global awareness	1. Climate change is one of the world's major environmental problems	88% strongly agreed/ agreed
	2. Maintaining biodiversity is one of the main environmental challenges of the century	72% strongly agreed/ agreed
	3. I believe that environmental problems are less important than economic problems	57% strongly disagreed/ disagreed
	4. Destruction of the world's rainforests does not affect me	75% strongly disagreed/ disagreed
	5. I can do nothing to prevent global warming	69% strongly disagreed/ disagreed
National/ UK awareness	6. I am worried about over-fishing in the North Sea	59% strongly agreed/ agreed
	7. I think we should be doing more to prevent loss of rare species of plants and animals in the UK	88% strongly agreed/ agreed
Local/ individual awareness	8. Protecting the environment is not my responsibility	79% strongly disagreed/ disagreed
	9. I would be willing to pay money for environmental cleanup or conservation programs in my area	49% strongly agreed/ agreed
	10. I am willing to change my life to a more environmentally sustainable way of living	76% strongly agreed/ agreed
Perceptions of solutions	11. Donating money is the only way people can help solve environmental problems	69% strongly disagreed/ disagreed

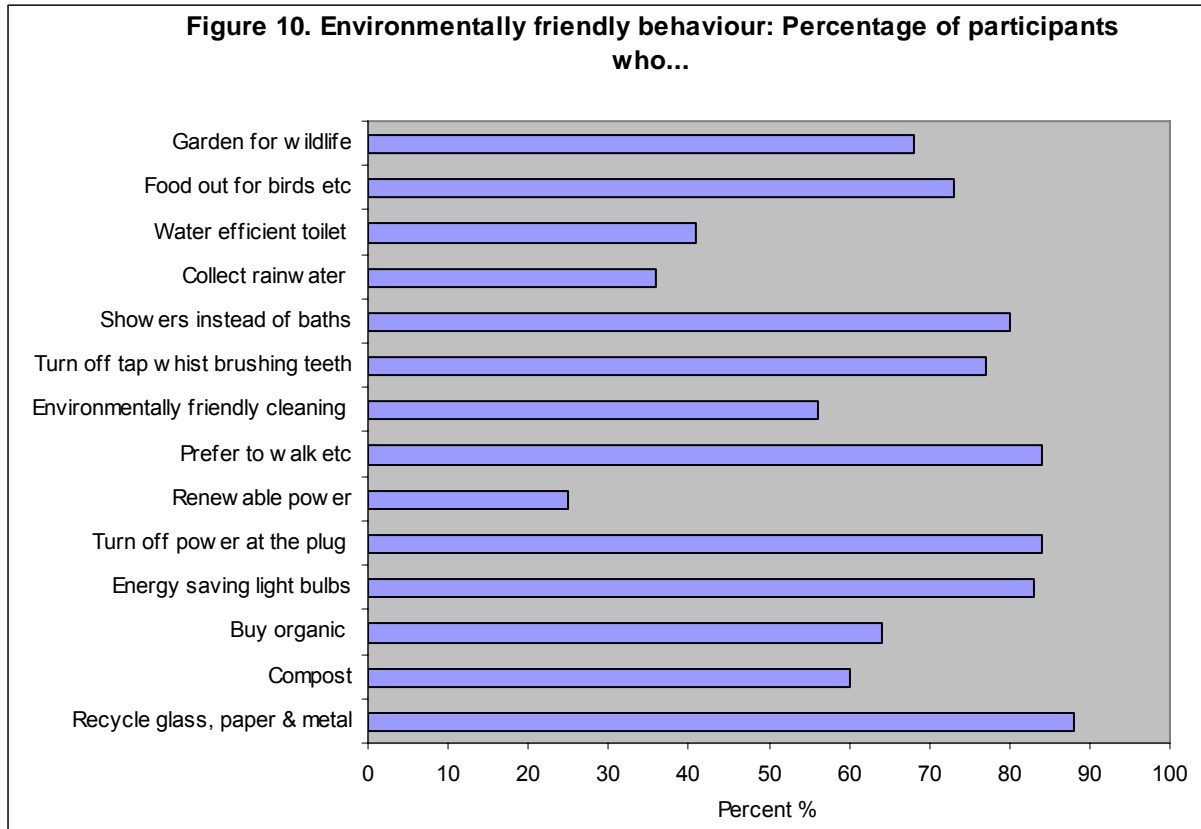
Further analysis showing the correlation between environmental awareness / sense of environmental responsibility and other variables is illustrated in section 4.2.

4.1.4 Environmentally friendly behaviour

The BTCV volunteers were also asked to detail the level and frequency of certain environmentally friendly lifestyle options and practices, measured by a specifically designed set of 14 questions. These questions referred to practices of all scales ranging from no cost options which are easily achievable by most people such as recycling glass, paper and metal, turning appliances off at the socket etc; inexpensive options but which may be dependent on having garden or outside space (e.g. composting waste, wildlife friendly gardening etc); to options which may require more effort or that have possible financial implications such as buying organic food and switching to an electricity company who provides renewable power.

Figure 10 shows the percentage of volunteers who answered yes to carrying out the various environmentally friendly practices. Of all the environmentally friendly practices recycling was the most popular being carried out by 88% of BTCV volunteers. Turning off power at the plug and preferring to walk rather than using the car were also carried out by 84% of respondents and using energy saving light bulbs (83%) and taking showers rather than baths (80%) were also

highest scoring practices. The practice carried out least by only 25% of participants was using an electricity company who provides renewable power.



The questionnaire was designed so that participants could tell us how frequently they carried out these practices (choosing from: 'always', 'most of the time' and 'occasionally') or the reason why they did not carry out these practices (choosing from: 'never really thought about it', 'no time', 'too much effort', 'too costly' or 'other'). Scores were given for frequency for each practice with "yes, always" scoring 3, "yes, most of the time" scoring 2 and "yes, occasionally" scoring 1. There was no score given if volunteers did not carry out the practice. In addition a total environmental behaviour score was calculated for each participant based on the responses to the 14 questions. This total environmental behaviour score could be anywhere on the scale between the lowest score of 0 (indicating no environmentally friendly behaviour) to the highest score of 42 (indicating a high frequency of environmentally friendly behaviour).

Total environmental behaviour score

The BTCV volunteer population scores ranged right across the scale from the lowest of 0 to the highest of 42, with the average score being 19.56 (SD 8.61) indicating a reasonable frequency of carrying out environmentally friendly practices.

Frequency

The top 3 environmentally friendly practices which participants stated that they carried out 'always' were: Recycling (49% of respondents), turning off the tap whilst cleaning teeth (46%)

and taking showers instead of baths with 42% of respondents. The most popular practices that were carried out 'most of the time' were using energy saving light bulbs (27%), turning off the power at the plug and preferring to walk or use public transport rather than use a car (26% of volunteers). Both of these frequently carried out categories featured options which are largely easy to do and low or zero cost. The practice that stood out as being carried out less frequently, classed as 'occasionally', was buying organic food at 44% of the participant population (see Table 2 for full details).

Table 2. Responses to questions relating to environmentally friendly practices

Ease of achievement	Environmentally friendly behaviours	Responses to questions (percent %)							
		Yes			No				
		always	most of the time	occasionally	not thought about it	no time	too much effort	too costly	other
No cost, easily achievable by most people	Recycle glass, paper & metal	49	24	15	7	1	1	1	2
	Turn off power at the plug on appliances when not in use	40	26	18	10	2	1	1	2
	Prefer to walk, cycle or use public transport rather than drive short distances	37	26	22	5	6	1	1	3
	Turn off tap whilst brushing teeth	46	16	15	14	1	3	1	4
	Take showers instead of baths	42	24	15	8	1	1	2	7
Inexpensive but dependent on having garden or outside space	Have a water efficient toilet at home (e.g. half flush option, brick in the cistern etc)	29	7	6	38	3	2	4	12
	Collect rainwater in butts	19	8	11	35	6	3	4	16
	Compost organic waste	24	17	20	20	5	2	1	12
	Put food out for birds / hedgehogs / foxes etc	34	14	26	13	2	1	1	9
	Make your garden attractive to wildlife	36	15	18	16	3	2	0	10
Possible financial implications and may require more effort	Buy organic food	7	13	44	11	1	1	17	6
	Use energy saving light bulbs	36	27	19	10	1	1	1	5
	Use environmentally friendly cleaning products (E.g. Ecover or vinegar)	14	16	26	27	2	2	5	7
	Use an electricity company who provides renewable power	12	5	8	49	3	1	10	12

Reasons for not adopting environmentally friendly practices

In this survey volunteers were given the choice of 5 reasons for not adopting environmentally practices ('never really thought about it', 'no time', 'too much effort'; 'too costly' or 'other'). The most commonly cited reason for not carrying out these practices was given as 'never really having thought about it', especially for i) using renewable power companies (49%) ii) having a water efficient toilet (38%) and iii) collecting rainwater (35%).

All the other reasons for not carrying out the various practices were not as commonly cited as 'not having really thought about it' and 'no time' and 'too much effort' in particular did not really feature at all. Only two practices, buying organic food (17%) and switching to a company who supplies renewable power (10%), were considered 'too costly' to carry out. Finally the 'no, other' category was mainly referred to by participants without gardens relating to the practices which require access to some kind of outside space. Again full details are shown in Table 2.

Further analysis showing the correlation between environmentally friendly practices and other variables is illustrated in section 4.2.

4.1.5 Qualitative responses

Participants in this study were given the opportunity to tell us what they thought was special about their involvement with BTCV Cymru. In total 287 comments were collated and although there was much variation and personal insight, the comments have been divided into 6 key themes:

Key Theme	Number of comments
1. Natural capital benefits - helping the environment / value of conservation	83
2. Natural capital benefits - local community	46
3. Social capital benefits - meeting people	56
4. Education benefits - learning new skills and knowledge	36
5. Health benefits - exercise and fresh air	12
6. Other comments – enjoyment, staff, outlooks etc	54

Examples of comments from BTCV volunteers on each of these themes are shown in Boxes 2-8.

For key theme 1: “Natural capital benefits - helping the environment / value of conservation” volunteers mainly highlighted the environmental benefits that volunteering for BTCV provides (see Box 2.)

Box 2. What is special about being involved with BTCV Cymru?
Key theme 1: Natural capital benefits - helping the environment / value of conservation
<p><i>“To encourage children to appreciate and respect their environment”</i></p> <p><i>“The work that BTCV are involved with helps communities individuals and hopefully the government to think about our environment”</i></p> <p><i>“Helping to get the message across about the importance of conservation”</i></p> <p><i>“BTCV provide people with an understanding of the environment and some of the changes which need to take place in order to assist in the conservation of our natural world”</i></p> <p><i>“Gives me an interest in environmental issues and to learn more about things and places you would not otherwise”</i></p> <p><i>“I like working with BTCV because it is helping the environment”</i></p> <p><i>“Being involved with BTCV Cymru and other organisational groups is a way in which ordinary people can help solve some environmental problems without donating large amounts of money and time - a valuable resource”</i></p> <p><i>“Working with people who are committed to protecting and maintaining the natural environment”</i></p> <p><i>“I’m helping the environment”</i></p> <p><i>“Friendly bunch of people working hard to play their part in educating people, working with nature, improving the environment whilst conserving it”</i></p> <p><i>“BTCV are people who really care about the environment, birds and the planet etc”</i></p> <p><i>“By doing my little bit of coppicing in Cardiff I was able to help in the wider world”</i></p> <p><i>“Improving Wales”</i></p> <p><i>“It helps to give something back to the countryside which I enjoy”</i></p> <p><i>“Being able to contribute to the conservation of the environment and encourage children to become interested”</i></p>

Box 3. What is special about being involved with BTCV Cymru?

Key theme 2: Natural capital benefits - local community

- "working with other members of the community to create a better environment"*
- "It is nice to see people and the area grow and change for the better"*
- "BTCV is a worthwhile job involving the local community - helps to improve local community areas"*
- "Working with the community IN the community"*
- "It's an opportunity to improve the community and make links with other residents"*
- "Opportunity to make a difference to my own environment - think global act local"*
- "Opportunity to improve my community"*
- "Making a happy community"*
- "Working with like-minded people helps me stay focused to help bring about local change in attitudes"*
- "Protecting the environment and looking after my community"*
- "The coming of people together for a good cause. it strengthens the community, getting everyone involved to understand about conservation"*
- "The chance to make my community more environmentally aware so we can learn and share the environment"*
- "The chance to give something back to the community for people to enjoy"*
- "Meeting people and to get to improve our community"*
- "I feel I am doing a small bit to help our planet even though it is only in our own area"*
- "Make people more aware of local environment issues"*

Box 4. What is special about being involved with BTCV Cymru?

Key theme 3: Social capital benefits - meeting people

- "Meeting new people and enjoying yourself"*
- "Making new friends and improving the environment at the same time"*
- "Provides an environment whereby volunteers can acquire new skills, become more aware of environmental issues and allows them to meet new people"*
- "Working with other people"*
- "Meeting good people and doing good work"*
- "Helping the environment, meeting people, getting out in the country"*
- "It's quite socially focused and the volunteers are from different backgrounds"*
- "Environmental improvements and meeting like-minded people"*
- "Meeting people and being active whilst making a small difference to the environment"*
- "Helping the community, meeting people, learning new skills and working outdoors"*
- "It keeps me occupied and I meet new people"*
- "Working with people improving places"*
- "Making new friends"*
- "Meeting people while partaking in environmental/ conservation friendly work"*
- "Meeting people and sharing and caring about our world"*
- "Meeting people, environmental focus"*
- "I see my friends and meet new people"*

For key theme 2: “Natural capital benefits - local community” comments both identified the benefits to local communities from the work of BTCV, and the personal benefits of higher involvement with the local community for the volunteer. Examples of these comments these can be seen in Box 3.

Box 5. What is special about being involved with BTCV Cymru?

Key Theme 4: Education benefits - learning new skills and knowledge

- “Opportunity to share and exchange knowledge”*
- “Potential for local action on conservation and for skilling-up potential labour force”*
- “It’s very flexible and you can learn lots of new skills for free”*
- “the opportunity to get involved and do something useful; and rewarding for myself, the community and the environment”*
- “Access to hands on practical conservation”*
- “Getting valuable work experiencing a broad range of subjects. doing something useful for the environment, involving people”*
- “To learn more skills and to meet new people and I like it a lot and I like to get out of the house”*
- “It helps me to help conserve the environment and help communities whilst educating myself and others”*
- “I can help people gain more skills”*
- “Learning new skills and knowledge”*
- “It is very successful at integrating people back into the community. BTCV provides opportunities for people from all backgrounds to learn new skills”*
- “Learning new skills and meeting new people”*
- “Because you learn a new trade and I like meeting people”*
- “Getting new skills and taking part in something bigger and more important”*
- “Chance to be out of doors, learning new things and improving the environment”*
- “To learn skills to get a job”*
- “I am learning and getting OCNs”*

Box 6. What is special about being involved with BTCV Cymru

Key theme 5: Health benefits - exercise and fresh air

- “Good fun, nice crowd of people It’s healthy, fresh air, good surroundings”*
- “Gain gentle exercise, meet people, learn new skills”*
- “I like walking”*
- “It gets you out in the fresh air, doing things for animals and keeping places orderly and tidy”*
- “Meeting people, getting fit, improving the community, learning new skills and protecting and conserving the environment”*
- “You are out and about and helping the countryside out”*
- “It gets me out of the house”*
- “It has been of great help both physically and otherwise”*
- “Digging - I like meeting people while picking the vegetables and fruit, weeding”*
- “Everything you need - lots of fresh air and exercise, making new friends, meeting people and keeps you fit!”*
- “We get out and are not on the streets”*
- “Good outside things to do, helps keep us fit and also helps the look of the place that we are doing”*

For key theme 3: “Social capital benefits - meeting people” comments mainly stressed the importance of meeting new people and making new friends whilst volunteering for BTCV. Examples of such “what is special” comments are shown in Box 4.

For key theme 4: “Education benefits - learning new skills and knowledge” comments largely acknowledged the acquisition of new skills whilst volunteering for BTCV. Volunteers felt these skills were important not only for the conservation work itself but also for possible future employment opportunities. Examples of such “what is special” comments are shown in Box 5.

Key theme 5: “Health benefits - exercise and fresh air” resulted in comments outlining the fact that as well as benefiting the environment, volunteers also reap various health benefits from volunteering with BTCV, namely getting fitter, gaining exercise and getting out into the fresh air. Further comments can be seen in Box 6.

Box 7. What is special about being involved with BTCV Cymru?
Key theme 6: Other comments – enjoyment, staff, outlooks etc
<i>“As a volunteer I feel I might be able to help in some small way however, it is only economically viable because I am disabled”</i>
<i>“It’s fun, good conservational work and I find it inspirational”</i>
<i>“BTCV employs staff who are very approachable, helpful and informative”</i>
<i>“It’s fun and it protects the environment”</i>
<i>“The help and support BTCV give to community groups and how they contribute to sustainability - therefore it’s special to belong to an organisation that cares about the environment”</i>
<i>“You see things from a different angle; personally I am becoming very conscious of the state of the planet. I myself recycle as much as I can and my 2 young children know to do so too - you realise that people’s actions affect the planet”</i>
<i>“It’s good fun and very exciting - I thoroughly enjoy gardening as I find it very fulfilling”</i>
<i>“It is an organisation which, with more members could have a more effective voice that single voices on their own”</i>
<i>“I greatly value my experiences with BTCV. BTCV is very inclusive”</i>
<i>“The people who work are there because they enjoy the work not just because it’s a job”</i>

The final key theme (no. 6): “Other comments – enjoyment, staff, outlooks etc” comments varied from praising the BTCV Cymru staff, acknowledging the fun and enjoyment aspects of volunteering; to identifying individuals’ environmental philosophies. Examples of these comments are shown in Box 7.

4.2 Relationships between volunteering for BTCV and environmental indicators

4.2.1 Relationships between environmental indicators

This study examines whether volunteering with BTCV is likely to lead to an increase in connectedness to nature, which then may lead to an increase in both local and global environmental awareness, a change in behaviour to incorporate ‘environmentally friendly’ practices into everyday life and ultimately to advocate environmental protection.

With this in mind, the relationships between the connectedness to nature score, the total environmental awareness/responsibility score and the environmental behaviour score were investigated. Initially, a one-way between groups multivariate analysis of variance (MANOVA) was conducted to identify if there were any significant differences in the environmental

awareness, connectedness to nature and environmentally friendly behaviour scores of the participants in phase 1 of the research with those taking part in phase 2. This did not reveal any statistically significant findings, indicating that participants' data is comparable for both studies, thus enabling analysis of all 403 participants as one dataset.

In order to evaluate relationships between the environmental variables, a series of Pearson product-moment correlation coefficients were conducted. Preliminary analyses were performed to ensure no violation of normality, linearity and homoscedasticity. The strongest, positive correlation was between total environmental awareness/responsibility and connectedness to nature [$r=.56$, $n=338$, $p<.001$] with 31% shared variance. There was also a medium, positive correlation between connectedness to nature and total environmental behaviour [$r=.42$, $n=318$, $p<.001$] with 18% shared variance and a medium, positive correlation between total environmental behaviour and total environmental awareness/responsibility [$r=.48$, $n=328$, $p<.001$] with 23% shared variance.

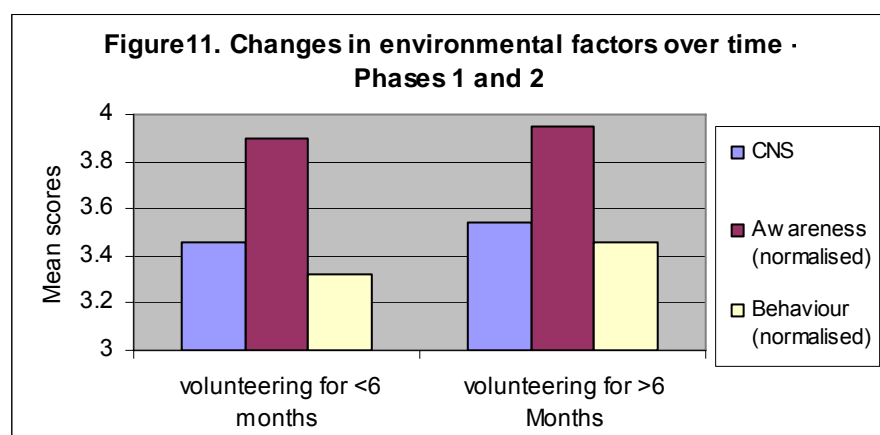
In short, the results of this study have shown that an increase in connectedness to nature is associated with increases in environmental awareness and responsibility and in environmentally friendly practice. This fact, although perhaps not surprising, shows that the underlying theory behind this research is from a sound basis and the 3 dependent variables are positively correlated. This study however does not specifically investigate the causality between these 3 variables.

The next step was then to examine whether there are increases in connectedness to nature, environmental awareness and environmentally friendly behaviour through being involved with BTCV Cymru.

4.2.2 Relationship between length of time volunteering for BTCV and environmental indicators

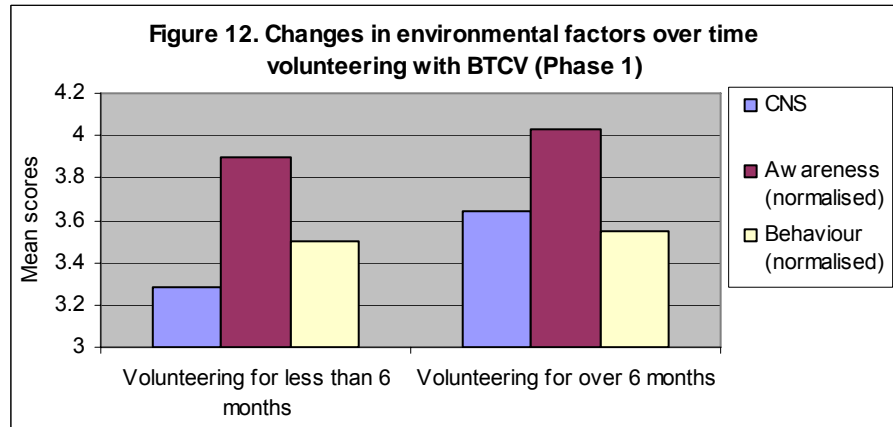
Initial overall findings showed that when the population is divided into those that have been volunteering with BTCV for 6 months or more compared to those who had been volunteering for less than 6 months, the average connectedness to nature, total environmental awareness/responsibility and total environmental behaviour scores appear to increase (see Figure 11).

In order to check that these increases were significant rather than just a coincidence, a one-way between groups multivariate analysis of variance was performed to investigate whether length of time volunteering for BTCV affected environmental awareness and behaviour.



Three dependent variables were used: connectedness to nature, environmental awareness/responsibility and environmental behaviour. The independent variable was length of time volunteering for BTCV (either 6 months or less or over 6 months). Preliminary assumption testing was conducted to check for normality, linearity, univariate and multivariate outliers, homogeneity of variance-covariance matrices and multicollinearity with no serious violations noted. With the whole sample of 403 participants there was found to be no statistically significant increase in values.

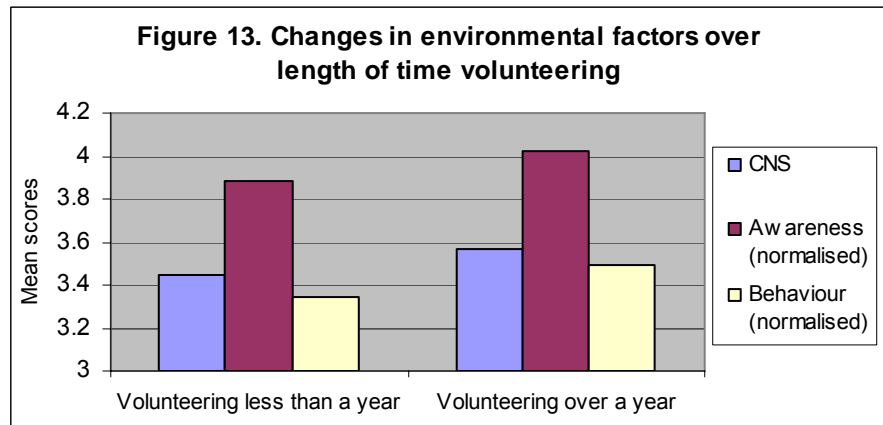
However the phase 1 research had found that there was a statistically significant difference between those who had been volunteering for less than 6 months and those volunteering for over 6 months on the combined dependent variables (see Figure 12): ($F_{3,162}=5.19, p<0.01$; Wilks' Lambda =.91;



partial eta squared=.08). In the phase 1 study, when the results for the dependent variables were considered separately, the only difference to reach statistical significance, using a Bonferroni adjusted alpha level of 0.017, was environmental behaviour.

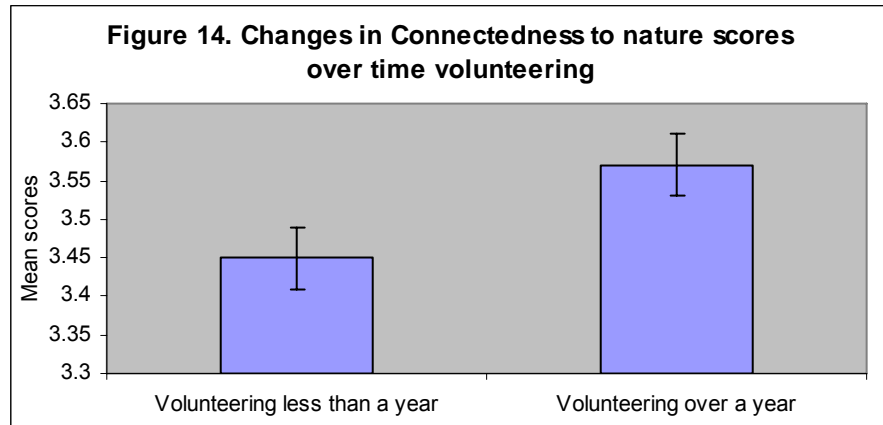
- Environmentally friendly behaviour ($F_{1,164}=14.76, p<0.001$, partial eta squared = .08) (small strength of association). An inspection of the mean scores indicated that those who had been volunteering for over 6 months had slightly higher levels of environmentally friendly behaviour ($M=23.10, \pm .95$) than those who have been volunteering for less than 6 months ($M=18.14, \pm .87$)

The combined phase 1 and phase 2 data was then split into those who have been volunteering for less than a year and those who have been volunteering for over a year to see if the observed changes in score were statistically more significant than those for a 6 month split (see Figure 13). An independent-samples t-

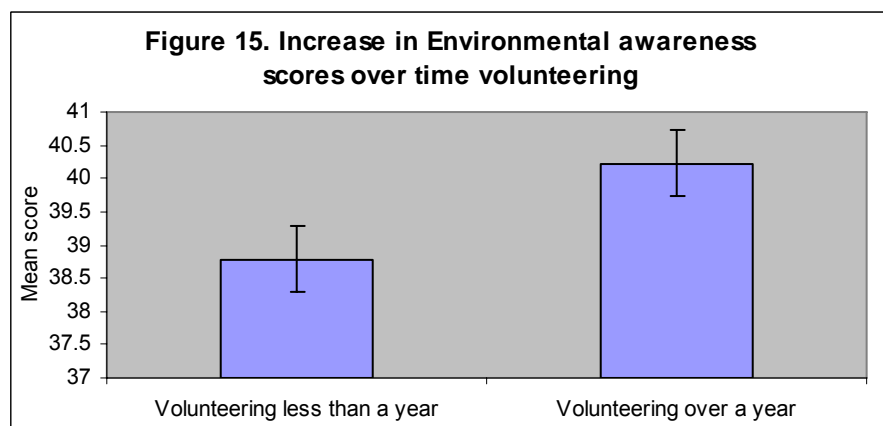


test was then conducted on each of the 3 dependent variables to compare the mean scores for those who had been volunteering for less than a year and those for more than a year.

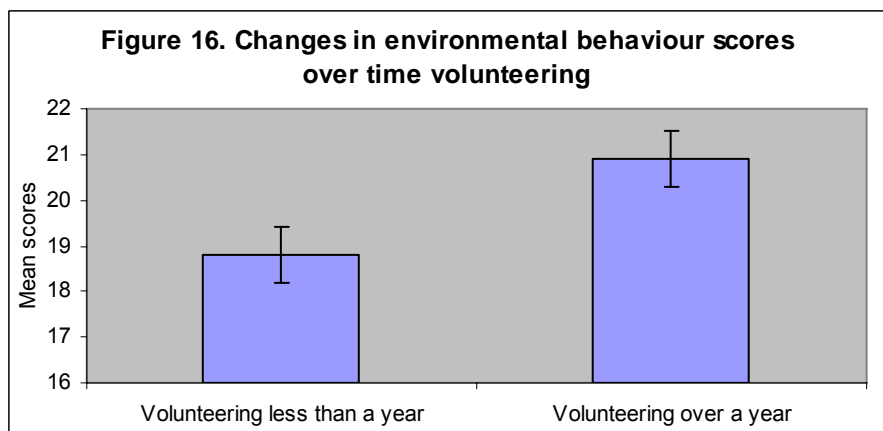
- For connectedness to nature there was no significant difference in mean scores for less than a year ($M=3.45 \pm .04$) and for more than a year ($M=3.57 \pm .05$; $t(347)=1.96$, $p=.05$) – see Figure 14.



- For environmental awareness and responsibility there was a statistically significant increase in mean scores for more than a year ($M=40.23 \pm .37$) compared with those who volunteered for less than a year ($M=38.78 \pm .56$; $t(355)=2.17$, $p<.05$). The magnitude of the difference was small (eta squared=.01) – see Figure 15.



- For environmental friendly behaviour there was a statistically significant increase in mean scores for more than a year ($M=20.90 \pm .79$) compared with those who volunteered for less than a year ($M=18.81 \pm .58$; $t(357)=2.13$, $p<.05$). The magnitude of the difference was again small (eta squared=.01) – see Figure 16.



Even though an inspection of the mean scores indicated that those who had been volunteering for a year or more had higher connectedness to nature, environmental awareness/ responsibility and environmentally friendly behaviour than those who have been out volunteering for less than a year, it is only the increases in environmental awareness and environmentally friendly behaviour which are statistically significant in the study. Environmental awareness and

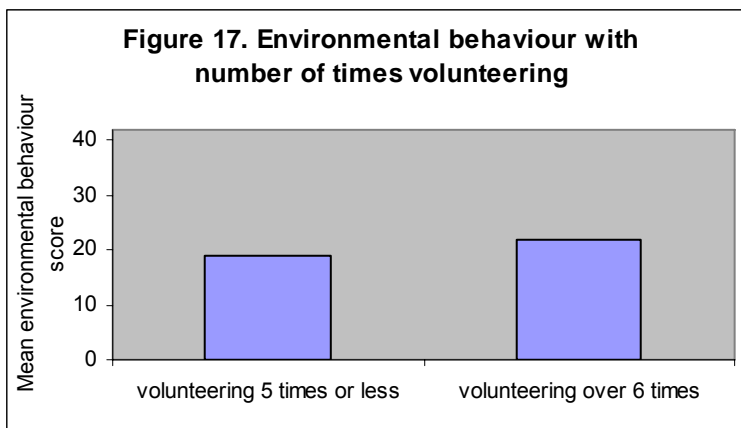
environmentally friendly practices can therefore be said to increase with length of time volunteering, but connectedness to nature is not so appreciably affected.

4.2.3 Relationship between the number of times volunteering for BTCV and environmental indicators

In phase 1 of the research we asked volunteers how many times they had volunteered for BTCV Cymru. As this question had proved slightly ambiguous in practice and inconclusive, in stage 2 of the research we refined the questionnaire and instead asked how frequently participants volunteered. For this reason the results below refer to the first phase of the research only and section 4.2.4 refers to frequency.

The relationship between number of times volunteering and the 3 environmental indicators was examined. The survey population was split into 2 similar sized categories, those who told us they had been out volunteering with BTCV Cymru for 5 times or less and those who had been out volunteering for 6 times and over.

Initial comparisons of the average scores for the 2 categories for each of the 3 environmental indicators suggested that there were varying increases in all cases with number of times participants had been out volunteering. These increases are shown in Figure 17.



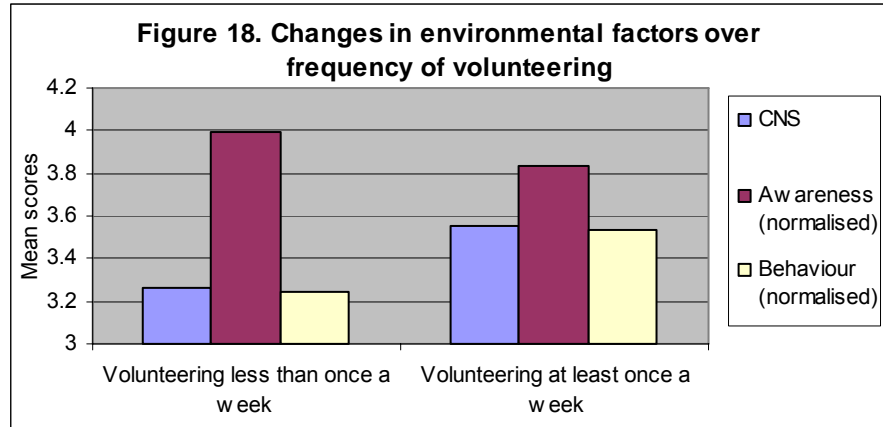
In order to check that these increases were significant rather than just a coincidence, a one-way between groups multivariate analysis of variance was performed to investigate whether number of times volunteering for BTCV affected environmental awareness and behaviour.

Three dependent variables were used: connectedness to nature, environmental awareness/responsibility and environmental behaviour. The independent variable was number of times volunteering for BTCV (5 times or less or 6 times and over). Preliminary assumption testing was conducted to check for normality, linearity, univariate and multivariate outliers, homogeneity of variance-covariance matrices and multicollinearity with no serious violations noted. There was no statistically significant difference between those who had been volunteering 5 times or less and those volunteering for 6 times or more on the combined dependent variables: ($F_{3,159}=2.50, p=.061$; Wilks' Lambda = .98; partial eta squared=.05). The results for the dependent variables were not therefore considered separately.

Even though an inspection of the mean scores indicated that those who had been volunteering 6 times or more had slightly higher levels of environmentally friendly behaviour than those who have been out volunteering for more than 6 times, the Phase 1 results cannot be considered statistically significant.

4.2.4 Relationship between the frequency and regularity of volunteering for BTCV and environmental indicators

In stage 2 of the research participants were asked how frequently they volunteered for BTCV Cymru. The results below refer to the second phase of the research only. The results of the research showed that when the population was divided into those who volunteer with BTCV at least once a week and those who volunteer for less than once a week, the average connectedness to nature and total environmental behaviour scores appear to increase with

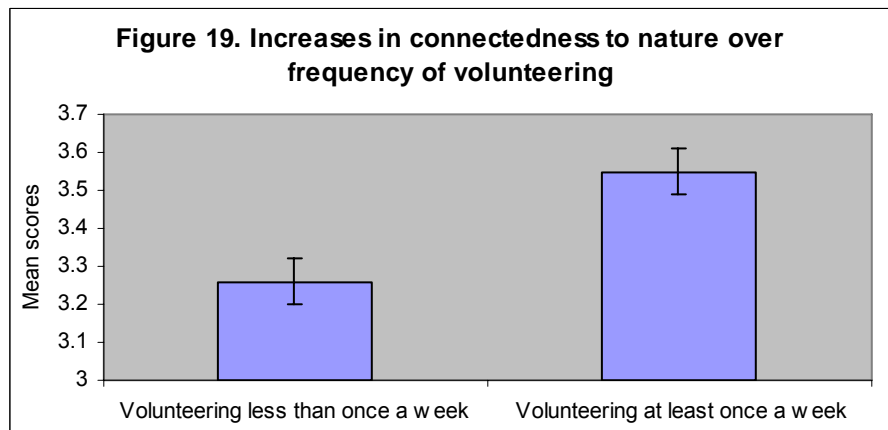


frequency, although environmental awareness scores appear to decrease (see Figure 18).

Again, in order to check that these increases were significant rather than just a coincidence, a one-way between groups multivariate analysis of variance was performed to investigate whether frequency of volunteering with BTCV affected the dependent variables of connectedness to nature, environmental awareness and behaviour.

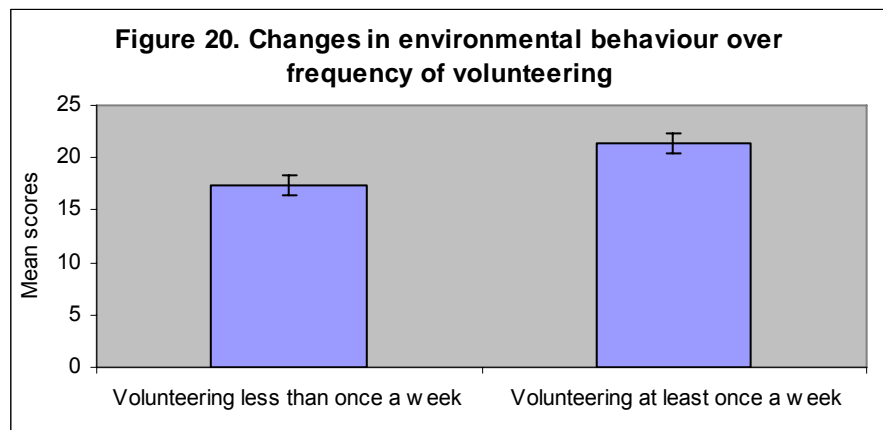
The independent variable was frequency of volunteering for BTCV (either at least once a week or less than once a week). Preliminary assumption testing was conducted to check for normality, linearity, univariate and multivariate outliers, homogeneity of variance-covariance matrices and multicollinearity with no serious violations noted. With the whole sample of 403 participants there was found to be a highly statistically significant increase in scores for those who volunteer more than once a week compared to those who volunteer less frequently: ($F_{3,127}=8.8, p<0.001$; Wilks' Lambda =.83; partial eta squared=.17). When the results for the dependent variables were considered separately, the increases to two variables reached statistical significance, using a Bonferroni adjusted alpha level of 0.017. The observed decrease in environmental awareness scores over frequency of volunteering was found to be non significant, so the research hypothesis was not compromised.

- Connectedness to nature ($F_{1,129}=7.59, p<0.001, \text{partial eta squared} = .05$) (small strength of association). An inspection of the mean scores indicated those who volunteered more frequently



with BTCV had higher connectedness to nature scores ($M=3.55, \pm .09$) than those who volunteer less than once a week ($M=3.26, \pm .05$) – see figure 19.

- Environmental behaviour ($F_{1,129}=7.41, p<0.01, \text{partial eta squared} = .05$) (small strength of association). An inspection of the mean scores indicated those who volunteered more frequently with BTCV had higher



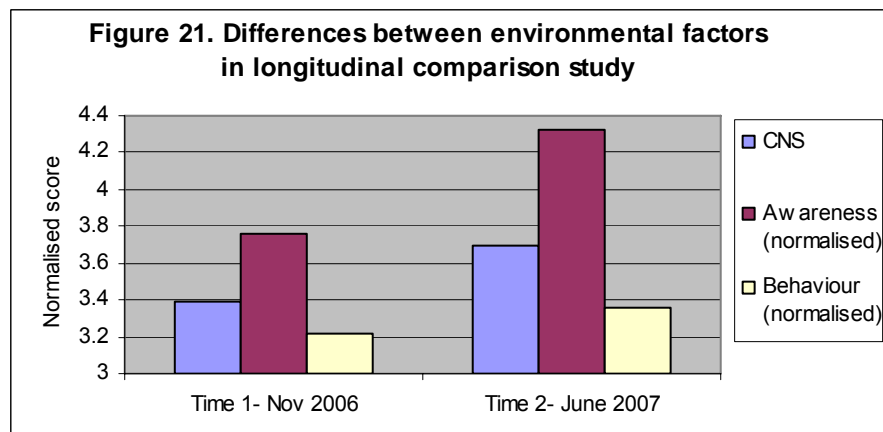
environmental behaviour scores ($M=21.39, \pm 1.1$) than those who volunteer less than once a week ($M=17.38, \pm .85$) – see figure 20.

The observed decreases in environmental awareness with frequency of volunteering were not statistically significant and so could be attributed to chance or coincidence. However connectedness to nature and environmentally friendly behaviour has been shown in this study to increase the more frequently that participants volunteer with BTCV.

4.2.5 Direct comparison longitudinal study

Changes in environmental variables over time

A longitudinal direct comparison study was also undertaken as part of this research for BTCV Cymru. A total of 18 people who took part in both studies (Phase 1 in November 2006 and Phase 2 in June/July 2007) gave us their names, to enable direct comparisons over the time scale of this research. Mean values of

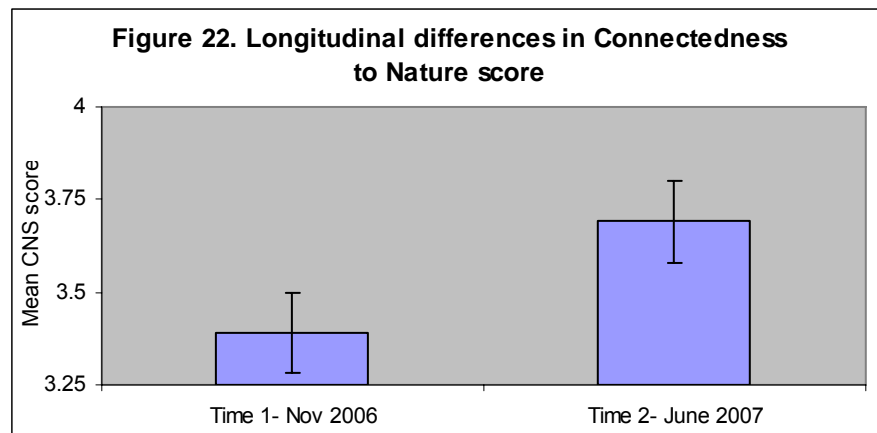


connectedness to nature, environmental awareness and environmentally friendly behaviour increased during the interval of the 2 studies (see Figure 21). These increases in before and after connectedness to nature, environmental awareness and environmentally friendly behaviour are more pronounced in this smaller direct comparison than those shown in the overall study. In fact, 88% of participants in the direct comparison study saw increases in their connectedness to nature score, 94% saw a rise in environmental awareness and responsibility scores and 71%

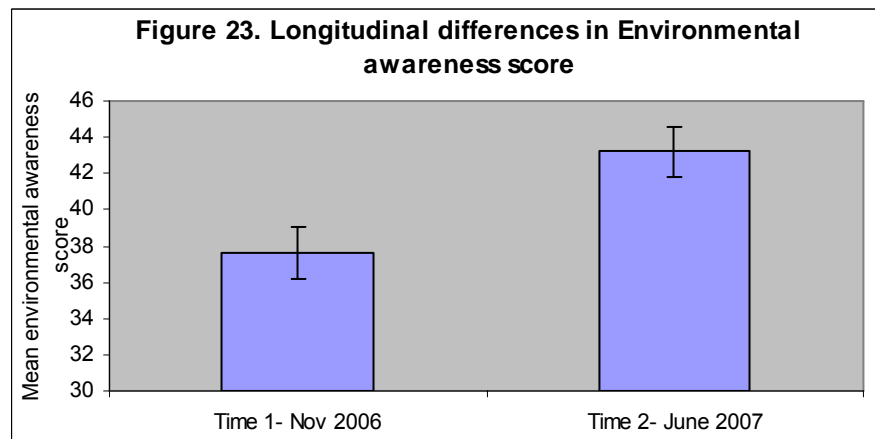
saw increases in environmentally friendly behaviour over the 8-9 months that they were volunteering with BTCV Cymru.

In order to check that these increases in mean value were statistically significant findings, rather than down to chance, a series of paired-samples t-tests were conducted to evaluate the impact of volunteering for BTCV over time on connectedness to nature, environmental awareness and behaviour.

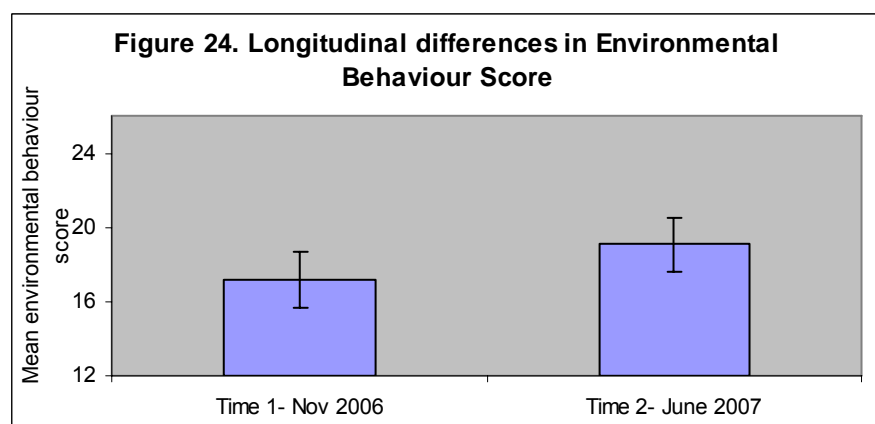
- There was a very statistically significant increase in connectedness to nature scores between phase 1 ($M=3.39 \pm .11$) and phase 2 ($M=3.69 \pm .13$, $t(16)=2.98$, $p<.01$). The eta squared statistic (.36) indicated a large effect size - see Figure 22.



- There was a highly statistically significant increase in environmental awareness scores between phase 1 ($M=37.61 \pm 1.54$) and phase 2 ($M=43.22 \pm 1.39$, $t(17)=4.55$, $p<.001$). The eta squared statistic (.55) again indicated a large effect size – see Figure 23.



- There was a statistically significant increase in environmentally friendly behaviour scores between phase 1 ($M=17.13 \pm 1.59$) and phase 2 ($M=19.06 \pm 1.54$, $t(15)=2.73$, $p<.05$). The eta squared statistic (.33) again indicated a large effect size – see Figure 24.



This small-scale direct comparison study clearly shows that the environmental factors of connectedness to nature, awareness of various environmental issues and participating in environmentally friendly practices are significantly increased after volunteering with BTCV Cymru for 8-9 months.

Details of changes in environmental awareness and behaviour

When the changes in environmental awareness scores between November 2006 and summer 2007 were examined in more detail, it is interesting to note which particular categories saw an increase over time. The biggest increases in environmental awareness were observed at the local or individual responsibility level, with the highest increase in the more practical dimensions, that is, for those volunteers who said they ‘would be willing to pay money for environmental cleanup or conservation programs in my area’ followed by those who said they are ‘willing to change my life to a more environmentally sustainable way of living’. This shows that BTCV volunteers in this longitudinal study are becoming more aware of the role that they themselves can play in protecting the environment. At the UK level an increase in awareness of the need to conserve UK biodiversity and an increase in concern for over fishing in the North Sea were observed and at the global level the increase in awareness scores were seen concerning climate change and global biodiversity.

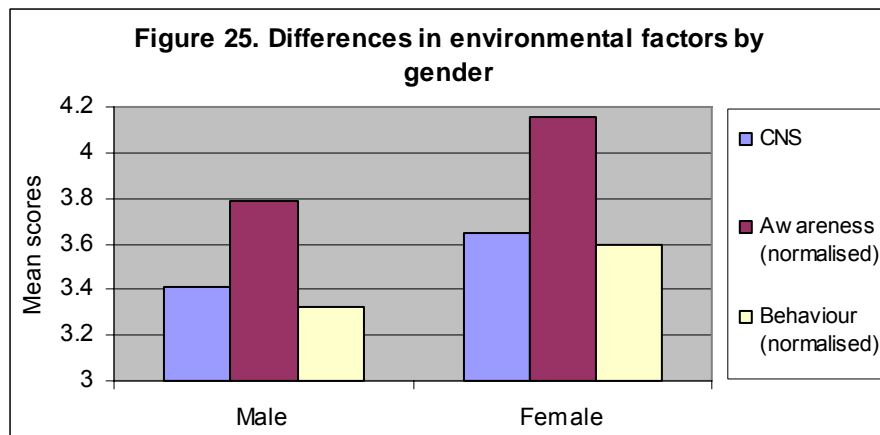
These results are from a relatively small-scale longitudinal study and therefore it would be difficult to generalise about the whole population of BTCV Cymru volunteers. However, it is possible to draw some specific conclusions from this sample of volunteers and to surmise that through learning about the environment and conservation as a result of hands-on conservation work for BTCV, many volunteers have become more aware particularly of local and UK environmental issues and what they can do as an individual to help make a difference.

Similarly the changes in environmental friendly practice scores between November 2006 and summer 2007 were examined in more detail to see which particular practices had seen an increase over time. The 3 practices that saw the greatest increase in volunteer participation were i) recycling glass, paper and metal (a 26% increase from 58% of the volunteers to 84% of volunteers recycling); ii) having a water efficient toilet (22% increase); and iii) turning off the power to appliances off at the plug (21% increase from 64% of volunteers to 85%). These are all relatively easy and low-cost environmentally friendly practices.

4.2.6 Other relationships

Relationship between gender and environmental indicators

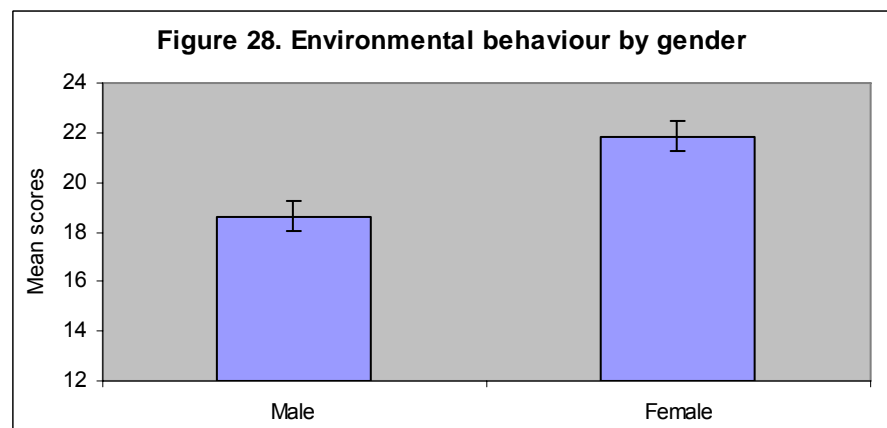
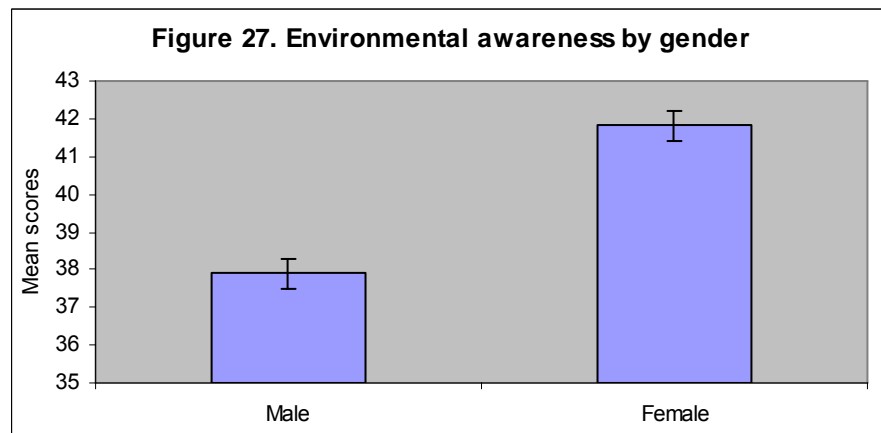
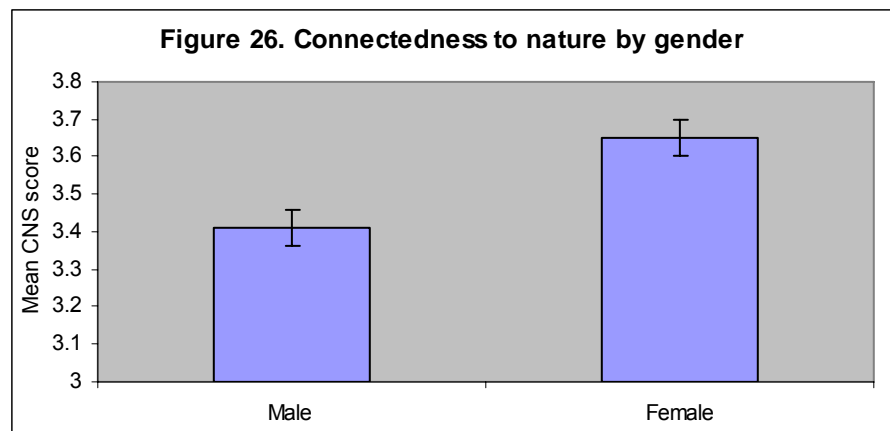
Initial analysis also suggested that gender may affect connectedness to nature, environmental awareness and behaviour in this study (see Figure 25).



Therefore a one-way between groups multivariate analysis of variance was performed to investigate whether gender affected environmental awareness and behaviour. Three dependent variables were used: connectedness to nature, environmental awareness/responsibility and environmental behaviour. The independent variable was gender. Preliminary assumption testing was conducted to check for normality, linearity, univariate and multivariate outliers, homogeneity of variance-covariance matrices and multicollinearity with no serious violations noted. There was a statistically significant difference between men and women for the combined dependent variables: ($F_{3,295}=12.39, p<0.001$; Wilks' Lambda = .88; partial eta squared=.11).

When the results for the dependent variables were considered separately, all 3 of the differences reached statistical significance, using a Bonferroni adjusted alpha level of 0.017.

- Connectedness to nature ($F_{1,297}=14.16, p<0.001$, partial eta squared = .05) (small strength of association). An inspection of the mean scores indicated women had slightly higher connectedness to nature scores ($M=3.65, \pm .06$) than men ($M=3.41, \pm .06$) – see Figure 26).
- Environmental awareness/responsibility ($F_{1,297}=36.71, p<0.001$, partial eta squared = .11) (moderate strength of association). An inspection of the mean scores indicated women had slightly higher environmental awareness/responsibility scores ($M=41.81, \pm .64$) than men ($M=37.90, \pm .59$) – see Figure 27).

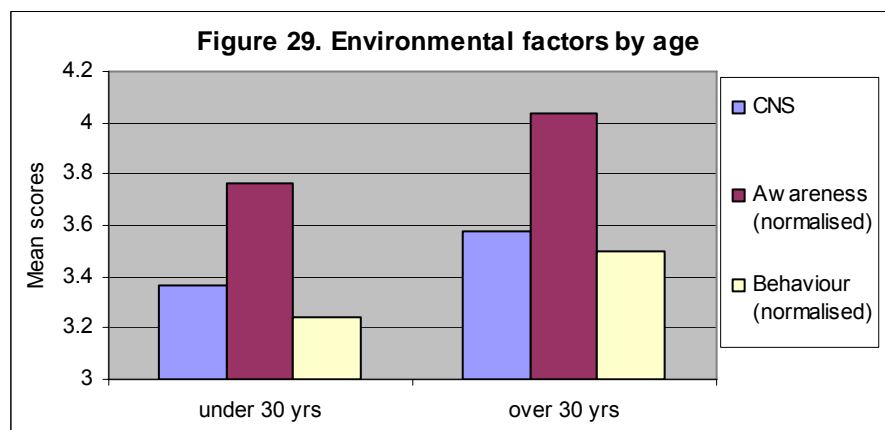


- Environmental behaviour ($F_{1,297}=11.42$, $p<0.001$, partial eta squared = .04) (low association strength). An inspection of the mean scores indicated women had slightly higher environmental behaviour scores ($M=21.86$, $\pm .96$) than men ($M=18.61$, $\pm .87$) – see Figure 28.

This research clearly shows that women volunteers have higher connectedness to nature, environmental awareness and display more environmentally friendly behaviour than men in our survey.

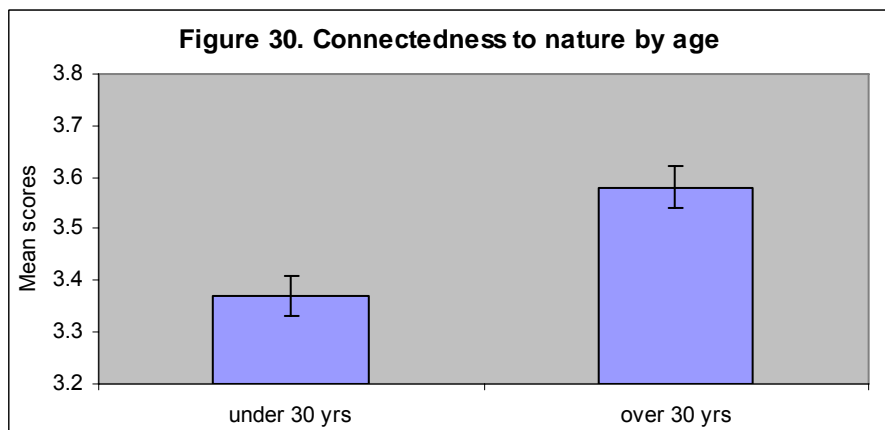
Relationship between age and environmental indicators

Initial analysis again suggested that age plays a part in determining our connectedness to nature, environmental awareness and behaviour (see Figure 29). Therefore in order to see if this was simply a coincidence or a statistically significant finding, a one-way between groups multivariate analysis of variance was performed to investigate whether gender affected environmental awareness and behaviour.



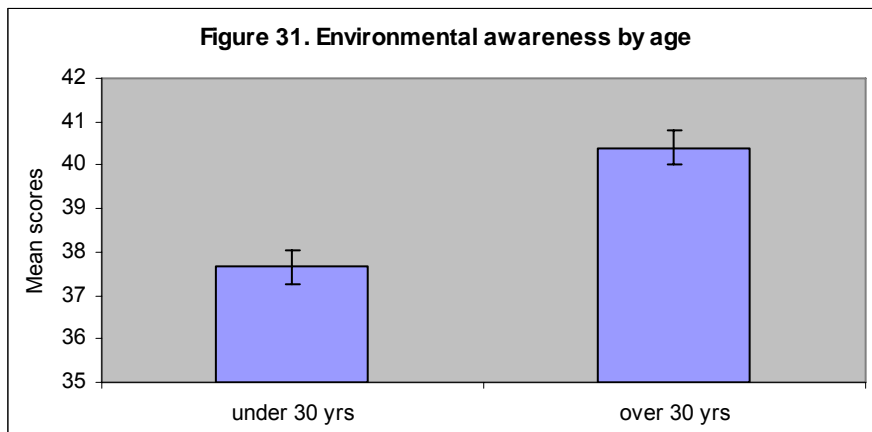
Three dependent variables were used: connectedness to nature, environmental awareness/responsibility and environmental behaviour. The independent variable was age (for the purposes of this analysis we divided the volunteers into those below 30 years and above 30 years of age). Preliminary assumption testing was conducted to check for normality, linearity, univariate and multivariate outliers, homogeneity of variance-covariance matrices and multicollinearity with no serious violations noted. There was a statistically significant difference between the 2 age groups for the combined dependent variables: ($F_{3,302}=6.76$, $p\leq 0.001$; Wilks' Lambda = .94; partial eta squared=.06).

When the results for the dependent variables were considered separately, all 3 of the differences reached statistical significance, using a Bonferroni adjusted alpha level of 0.017 for connectedness to nature and behaviour and of 0.008 for awareness.

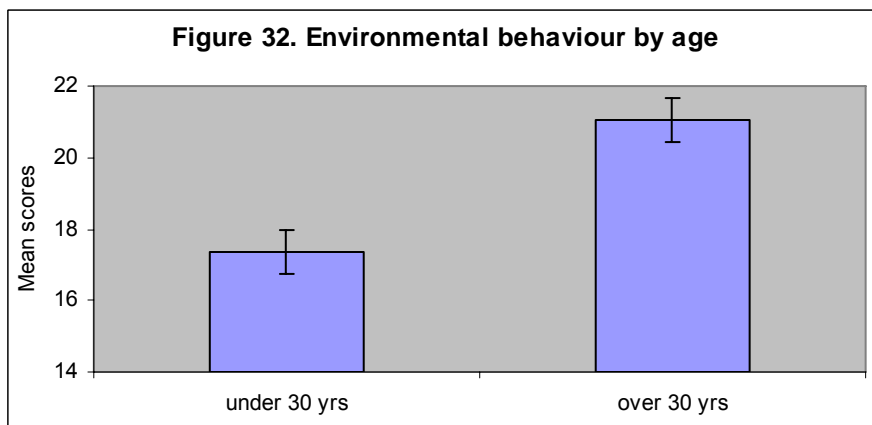


- Connectedness to nature ($F_{1,304} = 10.36, p \leq 0.001$, partial eta squared = .03) (moderate strength of association). An inspection of the mean scores indicated older volunteers had slightly higher connectedness to nature scores ($M = 3.60, \pm .04$) than younger volunteers ($M = 3.36, \pm .04$) – see Figure 30.

- Environmental awareness/ responsibility ($F_{1,304} = 15.07, p < 0.001$, partial eta squared = .05) (moderate strength of association). An inspection of the mean scores indicated older volunteers had slightly higher environmental awareness /responsibility scores ($M = 40.48, \pm .37$) than younger volunteers ($M = 37.91, \pm .49$) – see Figure 31.



- Environmental behaviour ($F_{1,304} = 14.06, p < 0.001$, partial eta squared = .04) (relatively low association strength). An inspection of the mean scores indicated older volunteers had higher environmental behaviour scores ($M = 21.02, \pm .58$) than younger volunteers ($M = 17.90, \pm .72$) – see Figure 32.



This research therefore has shown that volunteers over 30 years old displayed slightly higher connectedness to nature and environmental awareness and participated in more environmentally friendly practices than younger volunteers in this survey.

5. Conclusions

5.1 Discussion of evidence

A total of 403 volunteers (251 in phase 1 and 152 from phase 2) from 28 different BTCV groups, took part in this research by completing the composite questionnaire. Of these 403 BTCV Cymru volunteers, 18 participants gave us their names in both surveys to enable a direct longitudinal comparison.

This study examines whether volunteering with BTCV has led to an increase in connectedness to nature, an increase in both local and global environmental awareness, a change in behaviour to incorporate 'environmentally friendly' practices into everyday life and ultimately to advocate environmental protection.

Environmental factors – connectedness to nature, environmental awareness and environmental behaviour

Connection to nature is considered to be an important predictor of ecological behaviour and subjective well-being. The connectedness to nature scale was used in this study to assess whether volunteering with BTCV and being exposed to nature increases an individual's sense of feeling connected to nature. Looking at the surveyed group as a whole we found that BTCV volunteers were moderately connected to nature, as although scores varied from 1.71 to the highest score of 5, the average score was 3.50(SD 0.58).

For environmental awareness, the BTCV volunteer population scores ranged from the lowest of 23 to the highest of 50 with the average score being 39.28 (SD 5.88) which indicates a relatively high overall environmental awareness. Participants showed awareness of a range of environmental issues ranging from the global scale (e.g. climate change), the national/UK scale (UK biodiversity for example) and at the local and individual level.

The BTCV volunteers were also asked to detail the level and frequency of certain environmentally friendly lifestyle options and practices, measured by a specifically designed set of questions which referred to practices of all scales ranging from no cost options which are easily achievable by most people such as recycling glass, paper and metal, turning appliances off at the socket etc; inexpensive options but which may be dependent on having garden or outside space (e.g. composting waste, wildlife friendly gardening etc); to options which may require more effort or that have possible financial implications such as buying organic food and switching to an electricity company who provides renewable power.

The top 3 environmentally friendly practices which participants stated that they carried out 'always' were: recycling, turning off the tap whilst cleaning teeth and taking showers instead of baths. Both of the frequently carried out categories ('always' and 'most of the time') featured options which are largely easy to do and low or zero cost. The practice that stood out as being carried out less frequently, classed as 'occasionally', was buying organic food. From this research we have found that people are more likely to adopt environmentally friendly behaviours and practices which are relatively easy and inexpensive to carry out.

The most commonly cited reason for not carrying out various environmentally friendly practices in this study was given as "never really having thought about it" when referring to i) using renewable power companies ii) collecting rainwater in water butts and iii) having a water efficient toilet. Two practices however stood out as being thought of as being too costly to carry

out, buying organic food and switching to a company who supplies renewable power. Although cost is an obstacle for some environmentally friendly practices, the fact that many have never really thought about carrying out *other* practices, suggests that the range of environmentally friendly behaviours could increase with increased awareness and education initiatives.

As for the other environmental indicators, a total environmental behaviour score was calculated for each participant based on their responses and even though the BTCV volunteer population scores ranged right across the scale from the lowest of 0 to the highest of 42, the average score was 20.23, which suggests a good frequency of environmentally friendly practice amongst volunteers.

Relationships between environmental factors and volunteering with BTCV Cymru

There was a positive correlation between all 3 of the environmental dependent variables. Therefore with an increase in connectedness to nature, there is an increase in environmental awareness and responsibility and an increase in environmentally friendly behaviour. A volunteer who has a high connectedness to nature score is also likely to have high environmental awareness and responsibility and is likely to be practicing a number of environmentally friendly practices. This fact, although perhaps not surprising, supports the underlying theory behind this research. This study however does not specifically investigate the causality between these 3 variables.

When environmental indicator scores were compared between those volunteers who had been volunteering for BTCV Cymru for less than a year and those who had been volunteering for over a year increases in 2 of the variables were observed. For environmental awareness and responsibility and for environmental friendly behaviour there were statistically significant increases in mean scores for more than a year compared with those who volunteered for less than a year. Although the connectedness to nature scores also increased, they were not found to be statistically significant. Environmental awareness and environmentally friendly practices can therefore be said to increase with length of time volunteering, but connectedness to nature is not so appreciably affected.

However, when the data from the smaller direct comparison study were examined the observed increases in before and after connectedness to nature, environmental awareness and environmentally friendly behaviour scores were found to be much more pronounced than those shown in the overall study. These increases were found to be statistically significant and in fact, 88% of participants in the direct comparison study saw increases in their connectedness to nature score, 94% saw a rise in environmental awareness and responsibility scores and 71% saw increases in environmentally friendly behaviour over the 8-9 months that they were volunteering with BTCV Cymru.

When the changes in environmental awareness scores between November 2006 and summer 2007 were examined in more detail, the biggest increases in environmental awareness were observed at the local or individual responsibility level. This suggests that BTCV volunteers in this longitudinal study are becoming more aware of the role that they themselves can play in protecting the environment. At the UK level an increase in awareness of the need to conserve UK biodiversity and an increase in concern for over fishing in the North Sea were observed and at the global level the increase in awareness scores were seen concerning climate change and global biodiversity. These results are from a relatively small-scale longitudinal study and therefore it would be difficult to generalise about the whole population of BTCV Cymru volunteers. However, it is possible to draw some specific conclusions from this sample of

volunteers and to surmise that through learning about the environment and conservation as a result of hands-on conservation work for BTCV, many volunteers have become more aware particularly of local and UK environmental issues and what they can do as an individual to help make a difference.

Similarly the changes in environmental friendly practice scores in the small scale longitudinal study were examined in more detail to see which particular practices had seen an increase over time. The 3 practices that saw the greatest increase in volunteer participation were i) recycling glass, paper and metal (a 26% increase from 58% of the volunteers to 84% of volunteers recycling); ii) having a water efficient toilet (22% increase); and iii) turning off the power to appliances off at the plug (21% increase from 64% of volunteers to 85%). These are all the relatively easy and low-cost environmentally friendly options, which support findings from the phase 1 study that found that people are more likely to adopt environmentally friendly behaviours and practices which are relatively easy and inexpensive to carry out.

Volunteers in the second phase of the study were asked how frequently they volunteer for BTCV Cymru and the results for the environmental variables were compared for those who volunteer at least once a week and for those who volunteer less than once a week. An inspection of the mean scores indicated those who volunteered more frequently with BTCV had higher connectedness to nature scores and higher environmental behaviour scores than those who volunteer less than once a week. These increases in scores were both found to be statistically significant. However, the observed decreases in environmental awareness with frequency of volunteering were not found to be statistically significant and so could be attributed to chance or coincidence. Connectedness to nature and environmentally friendly behaviour can therefore be said to increase the more frequently that participants volunteer with BTCV, but environmental awareness is not so affected.

Other variations in environmental factors

In accordance with evidence in published literature regarding gender issues and environmental awareness and behaviour⁵, this research also found that women volunteers had higher connectedness to nature and awareness of environmental issues and displayed more environmentally friendly behaviour than the male volunteers in our survey.

In addition, volunteers over 30 years of age demonstrated slightly higher connectedness to nature and environmental awareness and participated in more environmentally friendly practices than the younger volunteers in this survey.

Motivations for volunteering with BTCV

The phase 1 study highlighted the need to examine any changes in motivation from when participants first started volunteering with BTCV to the current time, often many years later. In the phase 2 study we also asked respondents to tell us why they continue to volunteer with BTCV. In addition to the reasons given for starting out, the options of 'It makes me feel better' and 'Being outside in the fresh air' were added. The 4 main reasons for continuing to volunteer were given as: i) 'learning skills' (63% of participants), ii) 'the people' (62%) iii) 'being outside in the fresh air' (58%) and iv) 'an interest in the environment or conservation' (56%).

⁵ Zelenzy et al 2000

These motivations for volunteering with BTCV Cymru are as expected very much in keeping with what participants in the survey told us made volunteering ‘special’ for them. In total 287 ‘what is special?’ comments were collated and although there was much variation and personal insight, the comments fell into 6 key themes: i) natural capital benefits - helping the environment / value of conservation (83 comments), ii) natural capital benefits - local community (46 comments), iii) social capital benefits - meeting people (56), iv) education benefits - learning new skills and knowledge (36), v) health benefits - exercise and fresh air (12), vi) other comments – enjoyment, staff, outlooks etc (54 comments).

When the changes in motivation were examined in more detail in phase 2, we found that more participants appreciated the importance of the social element, the meeting up with fellow volunteers over time. Increases were also observed with ‘keeping fit and active’ and ‘improving my community’. Changes in motivation between starting to volunteer and having volunteered for some time suggest that participants appreciate new and different reasons for volunteering with BTCV over time.

In short, the results of this study have shown that an increase in connectedness to nature is associated with increases in environmental awareness and responsibility and in environmentally friendly practice. In turn, these environmental indicators increase with length of time volunteering with BTCV or in the case of connectedness to nature with frequency of volunteering with BTCV Cymru. Gender and age also make a difference to the level of connectedness to nature, awareness of environmental issues and uptake of environmentally friendly practices.

5.2 Conclusions

There is evidence that contact with the natural environment and green space promotes good health. It is also well-known that participation in regular physical activity generates physical and mental health benefits. This has led to the development of a “green exercise” programme which aims to quantify these positive effects on health and well-being in a range of contexts.

The UK is currently experiencing problems with obesity, sedentary lifestyles and disconnections from nature and the land. We are increasingly becoming an urbanised society, with limited understanding of the natural environment, or the impact of our actions upon it. Increasing participation in green exercise group activities, such as conservation volunteering for BTCV may provide an effective tool for tackling these issues, whilst also enhancing social capital and educating individuals and local communities alike on the role they can play in conserving green spaces and local ecosystems.

University of Essex green exercise research⁶ has previously shown that participation in a range of green exercise activities (including conservation volunteering) leads to significant health and social benefits. Self-esteem levels are significantly improved and feelings of anger, confusion, depression and tension all significantly improve post-activity. Similar research in Australia has found that members of land conservation groups experience higher levels of health and well-being than non-members⁷. The positive health benefits derived from participating in conservation activities include improvements to physical health and general mood, and in addition, to enhanced social capital.

⁶ Pretty et al 2005,2007

⁷ Moore et al 2006

The social benefits gained from establishing relations of trust, creating a sense of neighbourliness and forming local networks that help bind people together are an important part of the conservation volunteering experience. Conservation groups appear to contribute to the social capital of local communities and many studies have shown that involvement in conservation group activities increases social networking and fosters a sense of belonging⁸. These conservation groups also contribute to the environmental health of the area through the conservation work that they perform.

The BTCV Cymru research has indicated that a positive relationship exists between connectedness to nature, environmental behaviour and adoption of environmentally friendly behaviours and that there is an increase in these variables over time and frequency of volunteering with BTCV Cymru. The results of the direct longitudinal study also supported this and showed that the increase in all 3 variables (connectedness to nature, environmental awareness and environmentally friendly behaviour) over time is more pronounced, showing statistically significant results.

This study suggests that participating in conservation volunteering activities not only reconnects people to nature but also positively influences the environmental attitudes and behaviours of individuals, due to a range of motivators which provide the catalyst for change. The initial motivations for volunteering have been shown to change over time as individuals become more connected to nature, their environment and their fellow volunteers. The ethos “*think global, act local*” comes into play as people start to make small changes to their nearby nature, whilst increasing their global awareness and conscience. This often leads to a desire to spend more time in greenspaces, to care more about their environment and to work to conserve and protect it against any potential threats. Participating in conservation activities also enhances both physical health and psychological well-being as a secondary consequence of behavioural changes, which in turn encourages people to participate more frequently, thus continuing the cyclical process.

Therefore, all these conservation activities generate substantial environmental, social, and physical and mental health benefits, indicating the potential not only for environmental conservation but also for a wider health and well-being dividend. Green space rich in biodiversity provides the ideal opportunity for outdoor recreation and acts as a valuable health resource for its users. The concept of green exercise group activities, such as conservation volunteering and ‘Green Gyms’, therefore has important implications for public and environmental health, and for a wide range of policy sectors.

5.3 Future research

Although the findings from this research support the hypothesis that volunteering in environmental conservation increases feelings of connectedness to nature; heightens awareness of environmental issues; and increases the likelihood of carrying out environmentally friendly practices in addition to giving associated health and well-being benefits, there are several factors that would benefit from further research.

- The people who took part in this research had already, for whatever reason, decided to volunteer with BTCV. It could be argued then that these people are therefore already reasonably connected to nature, fit and healthy, motivated and socially included. The

⁸ Moore et al 2006, Burls and Caan 2004, Townsend and Marsh 2004, Irvine and Warbler 2002.

observed increases in environmentally friendly factors could just be suggestive of the fact that people who are healthy and socially included are more likely to volunteer their time and energy to conservation projects. It would be interesting to see if people who have never thought about taking part in conservation activities also see increases in connection to nature and environmental awareness as a result of volunteering with BTCV.

- More pronounced and significant results were observed in the small-scale repeated measures study where direct comparisons could be made between the same volunteers at different times. A larger scale, longer term project of research of this nature with more participants could show trends over longer timescales (6 months, 12 months, 18 months etc).
- Volunteering in conservation activities is associated with learning new skills, fostering an enthusiasm for the environment and community and building up social networks. As a result many volunteers become motivated to volunteer in other areas or move on to find a job (often in conservation) and so may not continue with volunteering with BTCV. Although this turnover of volunteers can be seen as a mark of the success of the project it can make longitudinal studies more problematic. It would be interesting to follow a group of BTCV Cymru volunteers over a period of time to discover where the initial volunteering with BTCV leads in terms of future directions for participants.
- perceptions of changes in environmentally friendly behaviour and awareness – it would also be interesting for future research to include a opportunity for volunteers to consider for themselves if their connectedness to nature, environmental awareness and behaviour (or other factors) have changed over time through being involved with BTCV Cymru.

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