University of Essex

GreenExercise

THE wildlife TRUSTS

A scientific evaluation of the health and wellbeing impacts of Wildlife Trusts volunteering programmes

The health and wellbeing impacts of volunteering with **The Wildlife Trusts**



Protecting **Wildlife** for the Future

This study, carried out by the Green Exercise Team at the University of Essex, analysed data relating to the participation of 139 people in Wildlife Trusts projects between February 2016 and February 2017. It assessed changes in participants' attitudes, behaviour and mental wellbeing over the course of 12 weeks, as a result of taking part in nature conservation volunteering programmes run by 5 Wildlife Trusts across the North, Midlands and South West of England.

The principal finding was that the mental wellbeing of participants improved significantly over the 12-week period, and that improvements were greatest for people who had not previously taken part in Wildlife Trust activities. At the start of the study period, 39% of participants reported low wellbeing, compared to UK norms. After 12 weeks, this had reduced to 19%.

Participants also reported enhanced levels of positivity, health, nature relatedness, pro-environmental behaviour, levels of physical activity and increased contact with greenspace.

GreenExercise

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The health and wellbeing impacts of volunteering with The Wildlife Trusts

Report for The Wildlife Trusts

Mike Rogerson, Jo Barton, Rachel Bragg and Jules Pretty

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Executive Summary

Background

This report represents Phase 3 of a three-phased programme of research conducted by the University of Essex aiming to establish The Wildlife Trusts' contribution to human wellbeing. Considered together with the findings of Phase 1, Phase 2 concluded that the extensive range of activities run by The Wildlife Trusts provide a range of benefits for both the health and wellbeing of the general population and those with diagnosed therapeutic needs. It also identified that there was a need for The Wildlife Trusts to evaluate health and wellbeing impacts more regularly, widely and consistently across activities and individual Trusts.

The purpose of Phase 3 was to carry out an independent, academic evaluation of the health and wellbeing benefits of taking part in a sample of activities run by Wildlife Trusts. Phase 3 had two overall aims:

i To measure direct physical health and mental wellbeing effects on participants involved with a Wildlife Trust initiative or project, in a robust scientific way.

ii To develop and pilot a simple, meaningful methodology which The Wildlife Trusts could scale up to use across The Wildlife Trusts to gather both longitudinal and UK–wide data in the future.

Method

Project participants were invited to take part in this research by completing questionnaires. Wildlife Trust project staff undertook the recruitment and administration processes designed by the University of Essex. Questionnaires were administered across three time-points: Baseline; 6-weeks (6-weeks after the baseline questionnaire was administered); 12-weeks. Each questionnaire was a composite, of bespoke items designed to capture personal information and other project-related data, and internationally recognised, validated questionnaire measures.

Findings

Analyses of the data revealed that Wildlife Trust projects are **successfully accessing individuals with low levels of personal wellbeing; and that project attendance was associated with statistically significant improvements in individuals' mental wellbeing. The percentage of participants reporting low wellbeing scores (defined by UK norms) declined from 39% at baseline to only 19% at 12-weeks**. Indeed, to a statistically significant extent, the positive impact on mental wellbeing was greater for individuals with low wellbeing to start with (compared to individuals who had average to high wellbeing to start with). **95% of participants with low wellbeing at baseline reported an improvement at 6-weeks, and for the baseline to 12-weeks sample, this figure was 83%. Participants also reported statistically significant enhanced levels of health, positivity, nature relatedness, pro-environmental behaviour and physical activity, and increased frequency of contact with greenspaces.**

For all health and behaviour-related measures other than frequency of greenspace contact, new starters reported mean (average) improvements and increases over time, that were greater than for existing attendees. The observations suggest that early engagement with Wildlife Trust projects promotes large improvements and increases in the measured parameters, which, with continued attendance, generally remain heightened despite minor fluctuations.

Across the three measured time-points, **new starters reported large increases in the importance they placed on improving the natural environment, improving fitness, learning new skills, being part of a group, conservation activities, being outside in nature and improving mental health.** Across the 12 weeks, the importance of 'conservation activities' and 'learning new skills' increased the most in attendees' rated importance, indicating that they could be key drivers of attendance. Intrinsic motivation enhances the likelihood of adherence to a behaviour. Learning new skills is one of the five ways to wellbeing.

Qualitative feedback indicated that project attendance enhanced individuals' sense of purpose, self- and social-confidence, and their physical and mental health and wellbeing. As well as changes in how individuals felt about themselves, attendance was associated with changes in the way that individuals felt about other people (notably individuals viewed others more positively, creating positive relationships with new sections of society, thereby reducing their own perceived social isolation) and about nature (increased awareness of nature and a new-found desire to learn more about the environment).



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Conclusions

Attendance of Wildlife Trust volunteering programmes is associated with health and wellbeing improvements particularly for people with low levels of wellbeing. Indeed, this research evidences that Wildlife Trust projects are associated with positive changes in measurable variables that map onto each of the five ways to wellbeing. It also gives insight into what some of the instrumental processes behind such impacts might be. **The health and wellbeing benefits that Wildlife Trust projects deliver indicate that they offer an important non-medical service that can and does reduce the current burden on the NHS;** The Wildlife Trusts should deliver this evidence with confidence to external audiences, to demonstrate and promote the efficacies of Wildlife Trust activities.

The methodology piloted here can also be replicated and scaled up in order to gather both longitudinal and UK–wide data across Wildlife Trusts in the future.

Future research of this kind might be strengthened through inclusion of a control group of matched individuals from local areas who do not attend Wildlife Trust projects. This would better-demonstrate causality of outcomes from project attendance. Greater sample sizes would also enable comparisons between activity types and other splits in data such as age, gender and vulnerable group classification, so to elucidate which groups benefit most from different activity types.

1. Introduction

An estimated 3% of UK adults (1,805,905 people) were in contact with mental health and learning disabilities services[a] during the year March 2015 – March 2016, and an estimated 5.6% (103,027 people) of those people spent time in hospital during that time frame[1]. However, the extent of the cost of treatment is currently levied by the fact that only 1 in 8 adults with a mental health problem is currently receiving treatment[2]. Although the government has not published figures on mental health funding since 2013, it was estimated at that time that the cost of mental health problems to the UK economy was £70–100 billion per year – 4.5% of gross domestic product[3]. However, when also accounting for reduced quality of life, a previous calculation estimated the annual costs in England alone at £105.2 billion[4]. Mental health issues are one of the main causes of overall disease burden worldwide[5]. Indeed, mental and physical health are complexly interrelated[6], and the quality and quantity of social relationships affect both aspects[7]. That is, health is 'a state of complete physical, mental, and social well-being and not merely the absence of disease or infirmity'[8]; parallel to the UK's mental health predicament are its current physical inactivity and obesity epidemics[9]. These issues indicate the pressing need both for upstream preventative initiatives and for services to individuals with mental health issues, in order both to improve the health and wellbeing of individuals, and to ameliorate the state of health at the national level – thereby reducing the burden on the economy overall, and more specifically, the NHS.

This report represents Phase 3 of a three-phased programme of research conducted by the University of Essex aiming to establish The Wildlife Trusts' contribution to human wellbeing. Phase 1 of this research, a literature review, identified that there is a large body of evidence from published peer-reviewed and grey literature to suggest that contact with a wide range of natural environments can provide benefits for health and wellbeing; such as reductions in stress and anxiety, increased positive mood, self-esteem and resilience, and improvements in social functioning and in social inclusion[10]. More specifically, it found that environments rich in wildlife are associated with improved wellbeing, through emotional, social and psychological outcomes. It cited a systematic review that found some, although non-conclusive, evidence that contact with biodiverse natural environments is associated with improvements spanning mental health outcomes and healthy behaviours[11].

A conclusion of Phase 1 was that agencies responsible for providing health and social care services would benefit from recognising the importance of nature-based activities for increasing health and wellbeing within communities. For this reason, both at local and national levels, evidencing the beneficial outcomes of nature-based activities offered by specific organisations is also important. Phase 1 also identified that while several individual studies and evaluations have pointed to the likely impact of particular actions by specific Wildlife Trusts, there has been no overall evaluation of the health and wellbeing impacts of the movement's collective work. Addressing this gap was therefore the primary aim of Phases 2 and 3 of the research programme.

Phase 2 of this research sought to assess the indirect and direct contributions of Wildlife Trusts to improving human health and wellbeing. It outlined that Wildlife Trusts typically run more than 14,400 activities for

[a] Many people who have a learning disability use mental health services and people in learning disability services may also have a mental health problem. This means that activity included in the dataset cannot be distinctly divided into mental health or learning disability spells of care – a single spell of care may include inputs from either or both types of service[2].

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the general public and 2,965 activities for vulnerable groups (individuals with defined needs) each year. Based upon evaluations previously undertaken by The Wildlife Trusts, Phase 2 identified that Wildlife Trust activities facilitated each of the five ways to wellbeing: participating members of the general public developed skills, improved their perceived and actual health and increased their physical activity; attendees from vulnerable groups reported improvements in confidence, self-esteem and mood and the ability to manage medication more effectively. Considered together with the findings of Phase 1, Phase 2 concluded that the extensive range of activities run by The Wildlife Trusts provide a range of benefits for both the health and wellbeing of the general population and those with diagnosed therapeutic needs. It also identified that there was a need for The Wildlife Trusts to evaluate health and wellbeing impacts more regularly, widely and consistently across different activities and individual Trusts.

1.1 The aims of Phase 3

The Phase 2 report recommended that in order to demonstrate the health and wellbeing impacts of individual Trusts, and to present a convincing collective case, The Wildlife Trusts should adopt a health and wellbeing evaluation tool and a systematic approach that allows individual Wildlife Trusts to collect, share and pool health and wellbeing evidence. Indeed, it is important to directly examine the wellbeing-related impacts of attendance at Wildlife Trust projects, so to better understand and begin to build an evidence base for these; such evidence and understanding might then be disseminated and used positively within health contexts both for the general public and for specific vulnerable groups. The purpose of Phase 3 was to carry out an independent, academic evaluation of the extent of health and wellbeing benefits of taking part in a sample of activities run by individual Wildlife Trusts, with two linked aims:

i To measure direct physical health and mental wellbeing effects on participants involved with a Wildlife Trust initiative or project, in a robust scientific way.

ii To develop and pilot a simple, meaningful methodology which The Wildlife Trusts could scale up to use across the movement to gather both longitudinal and UK–wide data in the future.



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2. Research and analysis design and methods

A research methodology was devised in order to measure some of the potential health and wellbeing outcomes of attendance at projects run across a number of independent Wildlife Trusts. This research was conducted between February 2016 and February 2017.

Data was collected from Wildlife Trust projects across five Wildlife Trusts:

Nottinghamshire Wildlife Trust:
Recovery project, Wildlife Trust Volunteers; Regular Wednesday Volunteers; Keeping it Wild (youth project)

Avon Wildlife Trust:
Wellbeing Through Nature; My Wild City

Tees Valley Wildlife Trust:
Wildlife Skills; Inclusive Volunteering Project; Life Skills

Gloucestershire Wildlife Trust:
Lower Woods Reserve; Stroud Volunteers Conservation Group

Lancashire Wildlife Trust:
MyPlace; Men in Sheds

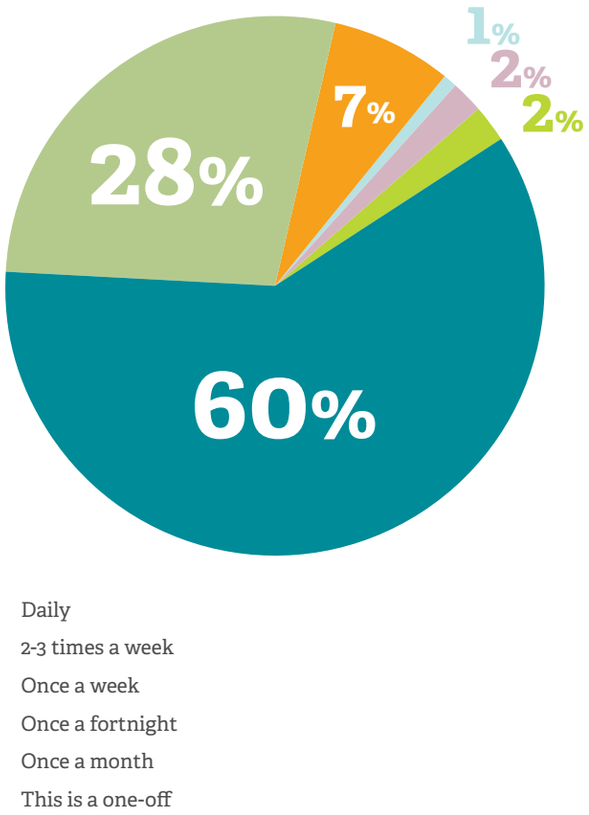
Descriptions of the individual Wildlife Trust projects can be found in Appendix 6.1.

2.1 Participants

Participants were 139 attendees to the Wildlife Trust projects (82% male, 16% female, 2% preferred not to state their sex). Participants' ages ranged from 18 – 76 years (mean age was 43.6 ± 17.4 years[b]). At the start of this research, participants had already been attending Wildlife Trust projects for between 0 and 416 weeks (mean number of weeks was 55.2 ± 88.6). The majority of attendees tended to be involved in Wildlife Trust projects once per week (see Figure 1).



Figure 1. Frequency of Participation in Wildlife Trust Projects



2.2 Design

Project attendees were invited to take part in this research by completing questionnaires designed by the University of Essex. Wildlife Trust project staff undertook the recruitment and administration of questionnaires at project sites, before, after and during project sessions. The questionnaires were administered across three time-points:

1. Baseline
2. 6-weeks – that is, 6-weeks after the baseline questionnaire was administered
3. 12-weeks – that is, 12-weeks after the baseline questionnaire was administered

[b] Standard deviation (represented by the symbol '±') quantifies the amount of variation a set of data values whereby low standard deviation indicates that the data points tend to be close to the mean values, and high standard deviation indicates that the data points are spread out over a wider range of values.

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Each questionnaire was composite, comprising both bespoke items designed to capture personal information and other project-related data, and internationally recognised, validated questionnaire measures. Most measures were included in all three questionnaires, to enable analyses of changes across the time-points.

Measures were chosen in order to examine changes in individuals' psychological wellbeing and feelings of health (as well as their feelings of connection to nature), their health-related and environment-related behaviours, and their feelings, perceptions and thoughts about participation in the projects. All of the measures used are linked to aspects of wellbeing, with many of these mapping onto the five ways to wellbeing (connect; be active; take notice; keep learning; give). Where possible, standardised, internationally recognised measures were used, and bespoke measures were designed in instances where this was not possible. An overview of the measures used is given in Table 1. Each measure is then described in more detail, with citations, within the Measures and Findings section.

Table 1. Overview of measures

Area	Facet	Measures	Validated / recognised or bespoke
Mental and physical health	Mental wellbeing	Warwick-Edinburgh Mental Wellbeing Scale	Validated / recognised
	Feelings of positivity	Rating from 0 – 10	Bespoke
	Nature relatedness	Short-form Nature Relatedness scale (NR-6)	Validated / recognised
	Social engagement and support	Statement items from the Social Wellbeing Module of the Centre for Local Economic Strategies / New Economics Foundation wellbeing evaluation tool	Validated / recognised
	Feelings of health	Rating from 0 - 10	Bespoke
Health- and environment-related behaviours	Physical activity	The International Physical Activity Questionnaire (IPAQ)	Validated / recognised
	Contact with greenspace	Menu options for categorising contact frequency	Bespoke
	Pro-environmental behaviours	Responding to statement items via Likert scale	Bespoke
Feelings, perceptions and thoughts about project participation	Importance scales (perceptions of the importance of project-related aspects)	Rating from 0 - 5	Bespoke
	Qualitative insight	Free answers to open-ended questions seeking participants' reflections	Bespoke

2.3 Statistical analyses of the data

Due to attendance fluctuations, data was not collected for all participants across all three time-points. There were many instances where data was collected from participants at Baseline and 6-weeks only, or Baseline and 12-weeks only. Further, within each questionnaire, not all participants completed all measures. Therefore, to make use of as much of the captured data as possible, for each appropriate measure, analyses took three separate but parallel paths.

Path 1

Repeated measures analysis of covariance (RM ANCOVA) was used first, in order to examine the change in reported values over all three time-points, whilst accounting for and examining the possible influence of the amount of time that participants had already been attending Wildlife Trust projects. This analysis also indicated whether, when not statistically controlled for, the amount of time that participants had already been attending the Wildlife Trust projects (at baseline) influenced the change in the given measure over time to a significant extent. Significant effects of this kind are described. If there is no specific mention of an effect, there was not a statistically significant impact of this kind in relation to the given measure.



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Path 2

Following this, repeated measures mixed analysis of variance (RM mixed ANOVA) was used to examine overall changes from baseline to 6-weeks, as well as generating insight into comparative differences between New Starters (those who had already been attending Wildlife Trust projects for three weeks or less at the Baseline time-point) and for Existing Attendees (those who had already been attending Wildlife Trust projects for four weeks or more at the Baseline time-point). Three weeks since original attendance was selected as the threshold for new starters as for many measures this threshold gave a more even split in sample size between new starters and existing attendees.

Path 3

Path 3 was the same as Path 2, except that it compared questionnaire data from the 12-weeks time-point (rather than 6-weeks) to Baseline data. An alpha value of 0.05 was used to indicate statistical significance. All statistical descriptions and values are given in Tables 5– 13.

3. Measures and Findings

Measures and the findings related to these are now presented in the following order, according to whether each measure relates most closely to mental and physical **health and wellbeing** (mental wellbeing; feelings of positivity; nature relatedness; social engagement and support; feelings of health), or health - and environment-related **behaviours** (physical activity; contact with greenspace; pro-environmental behaviours). Finally, qualitative insight, and participants' perceptions of the importance of project-related aspects are presented.

3.1 Mental and physical health

3.1.1 Mental wellbeing

Wellbeing was assessed using the Warwick Edinburgh Mental Well-being Scale (WEMWBS). The scale comprises a global well-being measure including affective-emotional aspects, cognitive-evaluative dimensions and psychological functioning; and is short enough to be used in population-level surveys[12]. The scale is validated for use in adults and adolescents in the UK and consists of 14 items, all of which are worded positively and address positive aspects of mental health[13]. It is scored by summing responses to each item, which are scored on a five point Likert scale from 1 (none of the time) to 5 (all of the time). The minimum score is 14 whilst the maximum score is 70; a higher score represents a better state of wellbeing. Mental wellbeing as measured by WEMWBS in the English population is shown to correlate with indexes of happiness and general health, and low scores can be predictive of depression[14].

The most recently surveyed national average for England is a score of 51.6, with a standard deviation of 8.7. Average wellbeing is considered to be within one standard deviation of the mean (42.9 – 60.3); a score above one standard deviation of the mean (61 or above) can be categorised as good wellbeing; a score below one standard deviation of the mean (below 43) can be categorised as poor wellbeing[15]. As mental wellbeing was a measure of primary interest and UK-based normative values are available, this measure was additionally analysed in relation to participants' wellbeing scores at baseline, which were categorised as either 'low wellbeing' or 'average to high wellbeing', in line with the national average scores and associated categorisations described.

Data across all three time-points

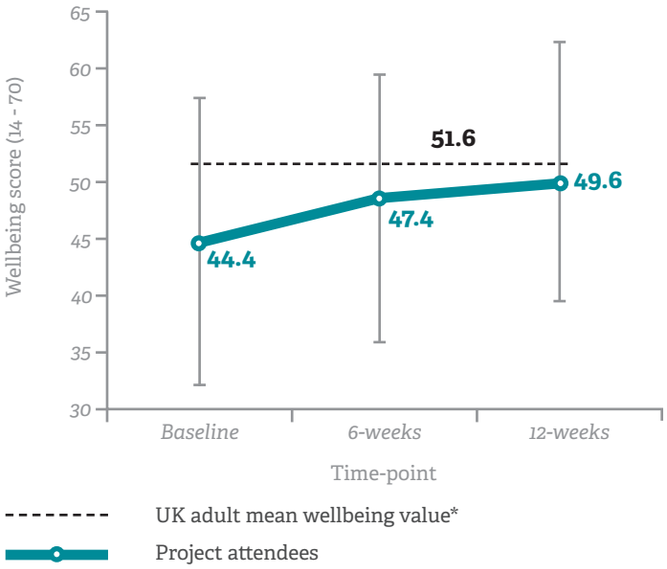
Data collected across all three time-points demonstrated that after accounting for variation in the amount of time that participants had already been attending the Wildlife Trust projects (at baseline), **wellbeing scores improved to a statistically significant extent across the three time-points** (Figure 2)[c]. However, this analysis also indicated that when not statistically controlled for, the amount of time that participants had already been attending the Wildlife Trust projects (at baseline) significantly influenced the change in wellbeing score over time[d]. That is, the less time that individuals had already been attending the Wildlife Trust projects, the greater their improvement over the measured time-points. As shown in Figure 3, **percentage of participants reporting low wellbeing scores declined from 39% at baseline to 19% at 12-weeks**. Percentage of participants reporting high wellbeing scores also declined from baseline to 6-weeks. Relating to this, it can be seen in the baseline to 6-weeks and baseline to 12-weeks comparisons that follow this section, that at baseline standard deviation values are notably greater for new starters than for existing attendees; this alludes to the possibility that some new starters may have reported higher scores due to conscious or non-conscious social desirability bias or discomfort with answering the wellbeing measure accurately. Following 6 and 12-weeks of project attendance, those participants may then have felt more comfortable to answer the wellbeing measure accurately, resulting in reported score decrease. Only one respondent reported the maximum score of 70 at all time-points, indicating only a small potential influence of ceiling effects. There were no instances of potential floor effects.

Data split by score categories at baseline

For data collected across all three time-points, it was also found that as a caveat to the statistically significant improvement across the overall sample over time[e], participants who had low wellbeing (as defined by Health Survey for England 2015 normative data) at baseline reported greater improvements across both 6-weeks and 12-weeks than did participants who had average or high wellbeing, and this difference was statistically significant[f]. Participants with low wellbeing at baseline reported 35% improvement in wellbeing score over the 12-weeks, whereas participants with average to high wellbeing at baseline reported a 3% improvement (Figure 4).

[c] $F_{2,66} = 13.46$, $p < 0.001$, [d] $F_{2,66} = 5.27$, $p = 0.008$, [e] $F_{2,68} = 12.48$, $p < 0.001$, [f] $F_{2,68} = 7.39$, $p = 0.001$

Figure 2. Mean (± 1 SD) wellbeing scores by time-point; data collected from participants across all three time-points

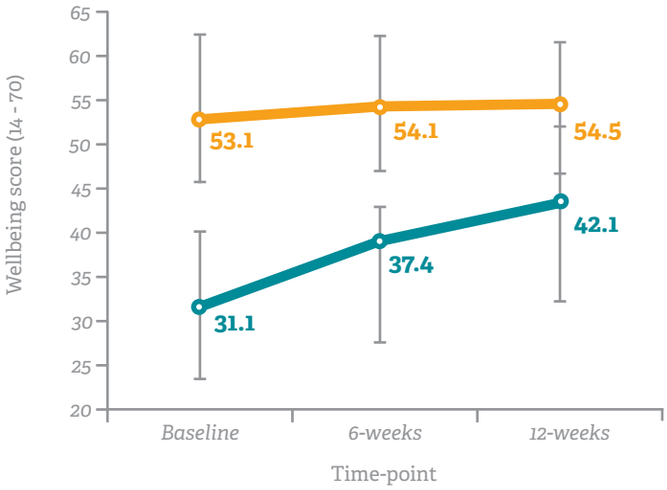


** Health Survey for England. Health Survey for England, 2015.*

Figure 3. Percentage of respondents within each category of wellbeing score by time-point; data collected from participants across all three time-points



Figure 4. Mean (± 1 SD) wellbeing scores by wellbeing score at baseline, by time-point; data collected from participants across all three time-points



'Low and 'average to high' categories informed by Health Survey for England. Health Survey for England, 2015.

Baseline to 6-weeks

Of individuals who reported wellbeing both at baseline and at 6-weeks (sample size = 57), 69% reported an improvement (7% reported no change; there was one instance of a possible ceiling effect whereby the highest possible score was given at both time-points); mean change was an improvement of 8.1%, which was statistically significant[g]. Over this time period, new starters reported significantly greater improvement (17% mean increase in score) than existing attendees (2% mean increase in score)[h]. See Figure 5

Data split by score categories at baseline

For data collected across all three time-points, it was also found that as a caveat to the statistically significant improvement across the overall sample over time[i], participants who had low wellbeing (as defined by Health Survey for England 2015 normative data) at baseline reported greater improvements at 6-weeks than did participants who had average or high wellbeing, and this difference was statistically significant[j]. Participants with low wellbeing at baseline reported 21% improvement in wellbeing score over the 6-weeks, whereas participants with average to high wellbeing at baseline reported a 4% improvement (Figure 6). 95% of participants with low wellbeing at baseline reported an improvement at 6-weeks.

[g] $F_{1,55} = 21.41$, $p < 0.001$, [h] $F_{1,55} = 10.75$, $p = 0.002$, [i] $F_{1,56} = 22.30$, $p < 0.001$, [j] $F_{1,56} = 5.44$, $p = 0.023$

Figure 5. Mean (± 1 SD) baseline and 6-week wellbeing scores by attendance classification

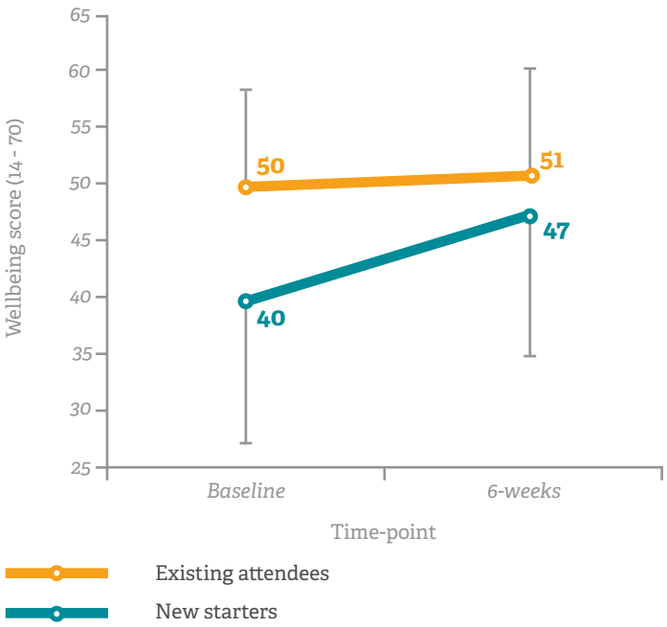
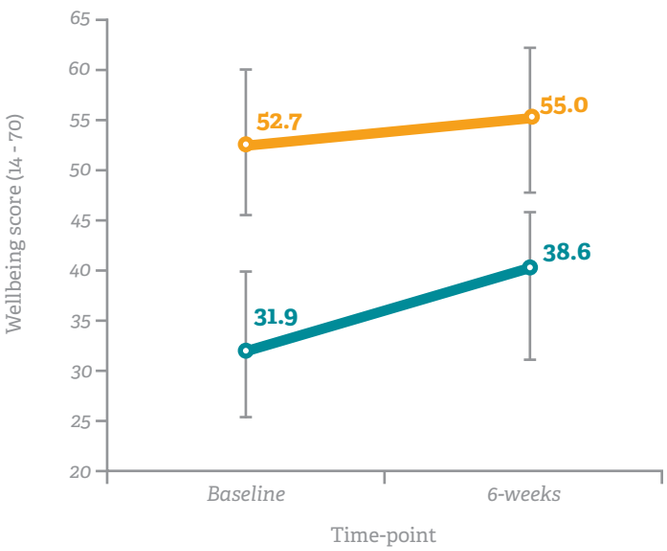


Figure 6. Mean (± 1 SD) baseline and 6-week wellbeing scores by wellbeing scores at baseline classification



[l]Low and 'average to high' categories informed by Health Survey for England. Health Survey for England, 2015.

Baseline to 12-weeks

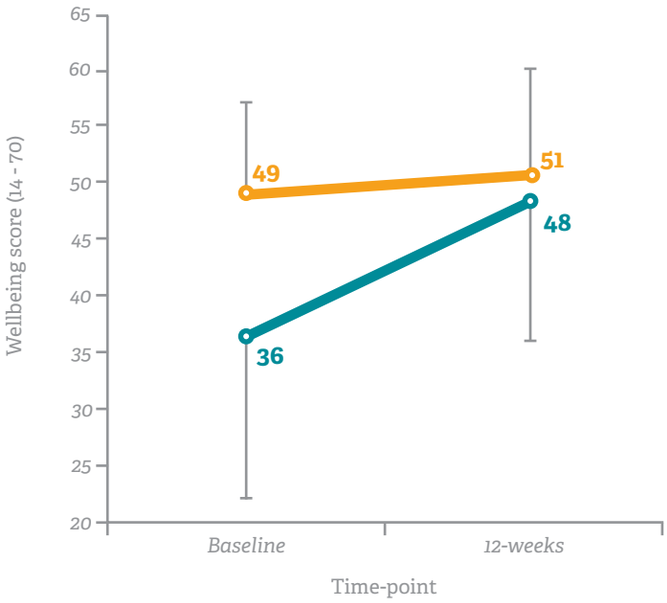
Of individuals who reported wellbeing both at baseline and at 12-weeks, 67% reported an improvement (7% reported no change; there was one instance of a possible ceiling effect whereby the highest possible score was given at both time-points); mean change was an improvement of 11%, which was statistically significant[k]. Over this time period, new starters reported significantly greater improvement (mean 33% increase in score) than existing attendees (mean 3% increase in score)[l]. See Figure 7.

The data both for baseline to 6-weeks and baseline to 12-weeks suggests it to be likely that existing attendees reported smaller improvements in wellbeing over time because they had more positive scores at baseline. Mean wellbeing scores across the time-points were at or below the national average for this measure. This shows that the Wildlife Trusts projects are reaching people with low levels of wellbeing, and are improving their wellbeing to a significant extent by bringing them much closer towards, or even above the national average score. Indeed, to a statistically significant extent, the positive impact on mental wellbeing was greater for individuals who had low wellbeing to start with (compared to individuals who had average to high wellbeing to start with).

Data split by score categories at baseline

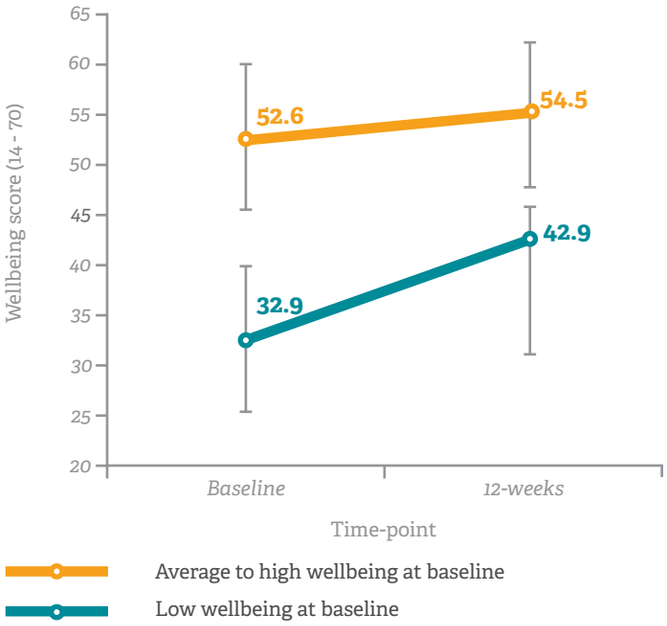
For data collected across all three time-points, it was also found that as a caveat to the statistically significant improvement across the overall sample over time[m], participants who had low wellbeing (as defined by Health Survey for England 2015 normative data) at baseline reported greater improvements at 12-weeks than did participants who had average or high wellbeing, and this difference was statistically significant[n]. Participants with low wellbeing at baseline reported 30% improvement in wellbeing score over the 12-weeks, whereas participants with average to high wellbeing at baseline reported a 4% improvement (Figure 8). **83% of participants with low wellbeing at baseline reported an improvement at 12-weeks**.

Figure 7. Mean (± 1 SD) baseline and 12-week wellbeing scores by attendance classification



[k]$F_{1,40}$ = 31.79, p< 0.001, [l]$F_{1,40}$ = 18.15, p< 0.001, [m]$F_{1,41}$ = 23.77, p< 0.001, [n]$F_{1,41}$ = 11.24, p= 0.002

Figure 8. Mean (± 1 SD) baseline and 12-week wellbeing scores by wellbeing scores at baseline classification



'Low and 'average to high' categories informed by Health Survey for England. Health Survey for England, 2015.

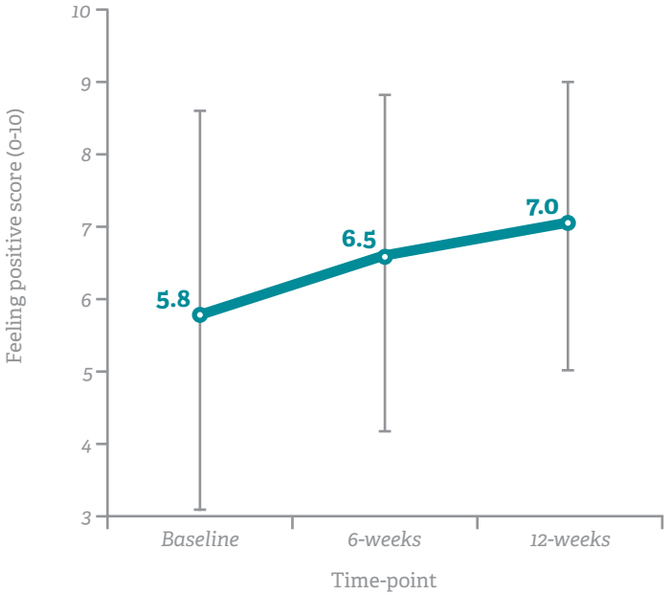
3.1.2 Feelings of positivity

Feelings of positivity were measured using a bespoke question whereby participants responded to the question: 'On a scale of 1 – 10, how positive do you feel at the moment (circle one number only)', by circling a number along a scale from 1 'Not at all positive' to 10 'Very positive'.

Data across all three time-points

Data collected across all three time-points demonstrated that after accounting for variation in the amount of time that participants had already (at baseline) been attending the Wildlife Trust projects, **feelings of positivity improved to a statistically significant extent across the three time-points**[o]. This analysis also indicated that when not statistically controlled for, the amount of time that participants had already (at baseline) been attending the Wildlife Trust projects significantly influenced the change in positivity score over time[p]. The newer that individuals were to the Wildlife Trust projects, the greater their improvement over the measured time-points. As shown in Figure 9, improvements over the 12-weeks was steady, with a percentage increase of 12% from baseline to 6-weeks, and a further percentage increase of 8% from 6-weeks to 12-weeks. Four respondents reported the maximum score of 10 at all time-points, indicating a small potential influence of ceiling effects. There were no instances of potential floor effects.

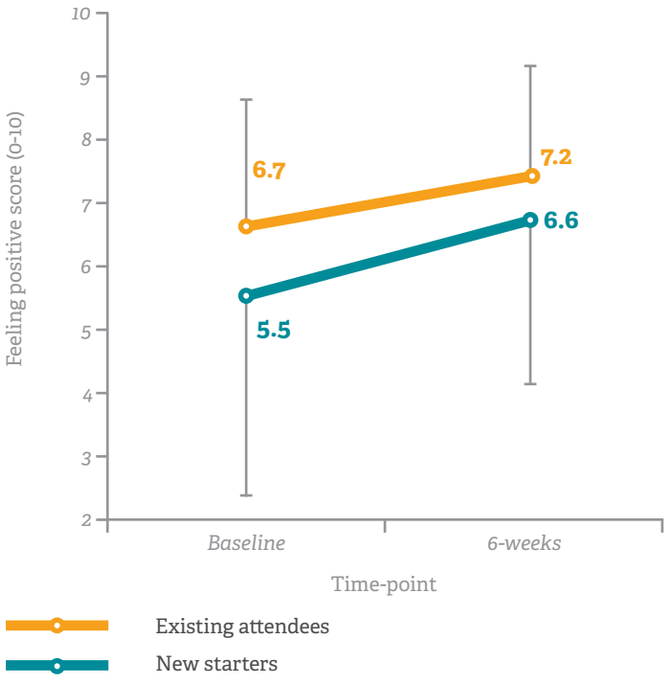
Figure 9. Mean (± 1 SD) positivity scores by time-point; data collected from participants across all three time-points



Baseline to 6-weeks

Of individuals who reported feelings of positivity both at baseline and at 6-weeks, 55% reported an improvement (30% reported no change; there were four instances of possible ceiling effects whereby highest possible scores were given at both time-points); mean change was an improvement of 12%, which was statistically significant[q]. Over this time period, new starters reported greater improvement (20% mean increase in score) than existing attendees (7% mean increase in score), although this difference was not statistically significant. See Figure 10.

Figure 10. Mean (± 1 SD) baseline and 6-week positivity scores by attendee classification



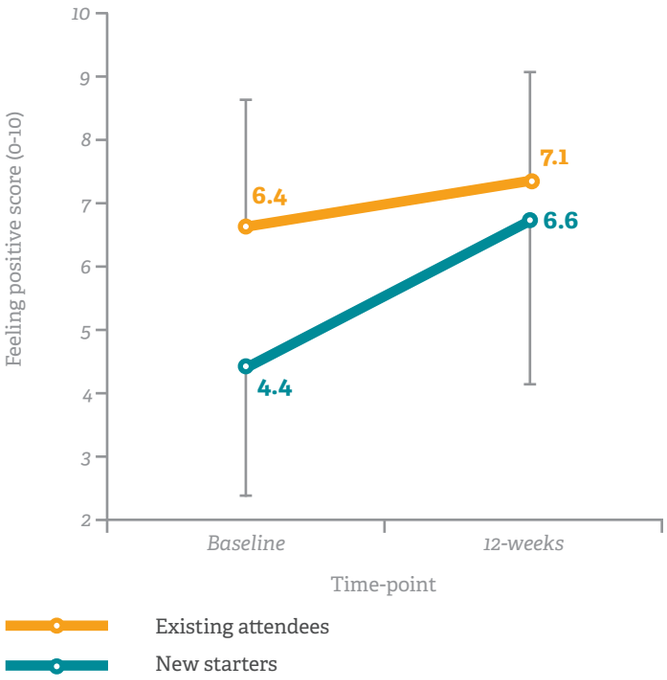
[o]$F_{2,62}$ = 20.44, p< 0.001, [p]$F_{2,66}$ = 5.33, p= 0.007, [q]$F_{1,53}$ = 20.52, p< 0.001

Baseline to 12-weeks

Of individuals who reported feelings of positivity both at baseline and at 12-weeks, 57% reported an improvement (33% reported no change; there were four instances of possible ceiling effects whereby highest possible scores were given at both time-points); mean change was an improvement of 21%, which was statistically significant[r]. Over this time period, new starters reported significantly greater improvement (mean 51% increase in score) than existing attendees (mean 11% increase in score)[s]. See Figure 11.

The data both for baseline to 6-weeks and baseline to 12-weeks suggests it to be likely that existing attendees reported smaller improvements in feeling positive over time because they had more positive scores at baseline.

Figure 11. Mean (± 1 SD) baseline and 12-week positivity scores by attendance classification



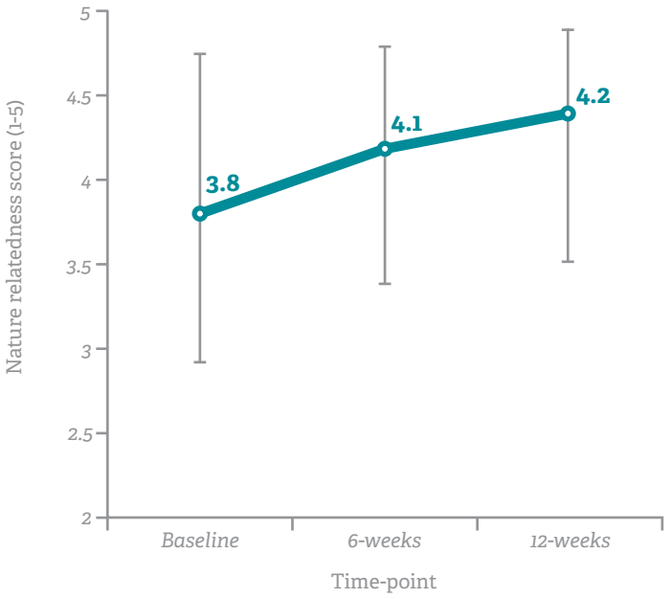
3.1.3 Nature relatedness

Nature relatedness is a relatively temporally stable measure of an individual's cognitive, affective and experiential connection to nature[16]. Nature relatedness has been shown to correlate with environmental scales, behaviour, and frequency of time in nature, and significantly predicts happiness[17]. The 'NR-6' nature relatedness scale comprises six items (see questionnaires in Appendix 6.3); participants respond to statement via a Likert scale from 1 'strongly disagree' to 5 'strongly agree'. Averaging scores for all items calculates an overall nature relatedness score. In line with Nisbet et al.[5], items are averaged to create a NR-6 score, with higher scores indicating greater levels of nature relatedness (maximum=5, minimum=1).

Data across all three time-points

Data collected across all three time-points demonstrated that levels of nature relatedness increased to a statistically significant extent across the three time-points[t], and that this increase was not impacted to a statistically significant extent by the length of time that participants had already been attending the Wildlife Trust projects. As shown in Figure 12, improvements over the 12-weeks decelerated over time, with a percentage increase of 8% from Baseline to 6-weeks, and a further percentage increase of 2% from 6-weeks to 12-weeks. Two respondents reported the maximum score of 5 at all time-points, indicating a small potential influence of ceiling effects. There were no instances of potential floor effects.

Figure 12. Mean (± 1 SD) nature relatedness scores by time-point; data collected from participants across all three time-points



Baseline to 6-weeks

Of individuals who reported on the measure of nature relatedness both at baseline and at 6-weeks, 58% reported an improvement (22% reported no change; there were three instances of possible ceiling effects whereby highest possible scores were given at both time-points); mean change was an improvement of 6%, which was statistically significant[u]. Over this time period, new starters reported greater improvement (11% mean increase in score) than existing attendees (5% mean increase in score), although this difference was not statistically significant. See Figure 13.

[r] $F_{1,39} = 33.28$, $p < 0.001$, [s] $F_{1,39} = 8.92$, $p = 0.005$, [t] $F_{2,60} = 6.37$, $p = 0.003$, [u] $F_{1,52} = 10.569$, $p = 0.002$

Figure 13. Mean (± 1 SD) baseline and 6-week nature relatedness scores by attendee classification

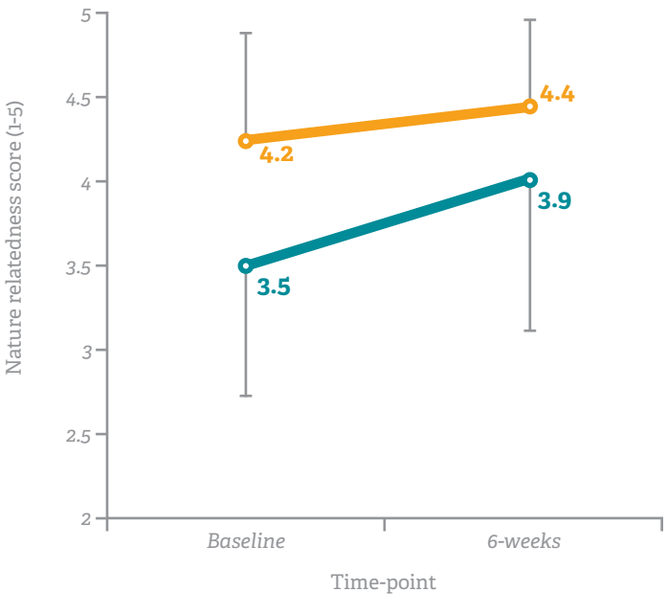
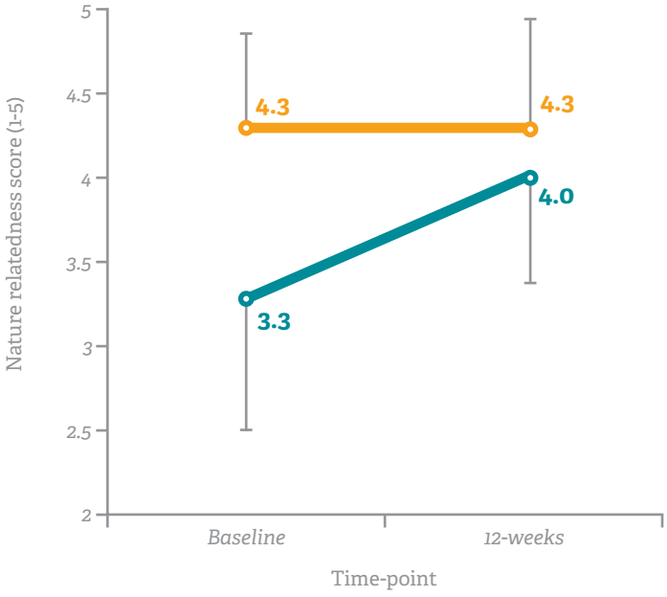


Figure 14. Mean (± 1 SD) baseline and 12-week nature relatedness scores by attendance classification



Baseline to 12-weeks

Of individuals who reported nature relatedness both at baseline and at 12-weeks, 55% reported an increase (19% reported no change; there were three instances of possible ceiling effects whereby highest possible scores were given at both time-points); mean change was an increase of 7%, which was statistically significant[v]. Over this time period, new starters reported significantly greater increase (mean 21% increase in score) than existing attendees (mean 2% increase in score)[w]. See Figure 14.

The data both for baseline to 6-weeks and baseline to 12-weeks suggests it to be likely that existing attendees reported smaller increases in nature relatedness over time because they had higher scores at baseline.

Together, the analyses evidence that Wildlife Trust project attendance is associated with increases in nature relatedness, and that greatest increases occur early on, then slowing but remaining high. The concept of nature relatedness greatly resonates with the five ways to wellbeing's facet of 'take notice'; indeed, one of the items of this measure is that of 'I take notice of wildlife wherever I am'. The current findings therefore evidence that Wildlife Trust projects successfully engage and contribute to this wellbeing pathway.

3.1.4 Social engagement and support

A social engagement and support measure was taken from the Social Wellbeing Module of the Centre for Local Economic Strategies / New Economics Foundation wellbeing evaluation tool[18]. Participants were asked how much they agreed or disagreed with a series of three statements relating to different aspects of social engagement and support. The statements can be seen in the questionnaires, within Appendix 6.3. The statements comprise of a mix of customised statements and together with others adapted from the European Social Survey(ESS)[x]. Responses were reported via a five-point Likert scale from 1 'strongly disagree' to 5 'strongly agree'. An overall social engagement and support score was calculated by summing scores of the three items and dividing this value by 3. Social engagement and support scores therefore range from a minimum of 1 to a maximum of 5.

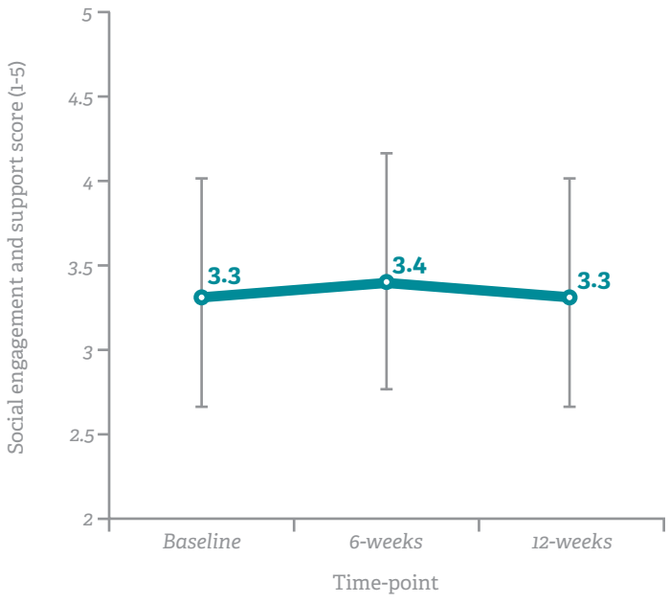
Data across all three time-points

Data collected across all three time-points demonstrated that there was not a statistically significant change in social engagement and support scores over the measured time-points. As shown in Figure 15, mean score increased by 3% from Baseline to 6-weeks, before falling back to the original baseline value at 12-weeks. There were no instances of possible floor or ceiling effects.

[v] $F_{1,39}$ =,10.84 p= 0.002, [w] $F_{1,39}$ = 6.58 , p= 0.014

[x] The European Social Survey is an academically-driven social survey, designed to chart and explain the interaction between Europe's changing institutions and the attitudes, beliefs and behaviour patterns of its diverse populations. See www.europeansocialsurvey.org/ for more information.

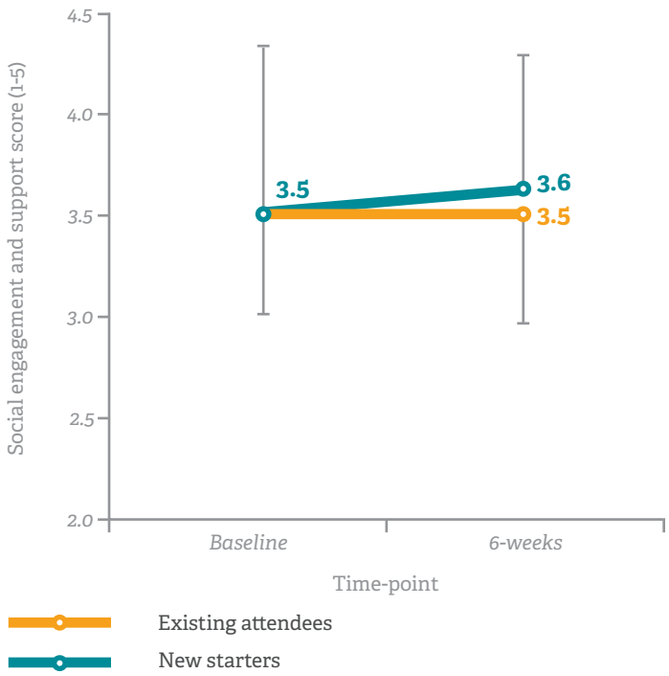
Figure 15. Mean (± 1 SD) social wellbeing score by time-point; data collected from participants across all three time-points



Baseline to 6-weeks

Of individuals who reported on the social engagement and support items both at baseline and at 6-weeks, 41% reported an increase (33% reported no change; there was one instance of a possible ceiling effect whereby highest possible scores were given at both time-points); mean change was an improvement of 0.7%, which was not statistically significant. There was little difference between new starters' scores and existing attendees' scores or score valence over time; see Figure 16.

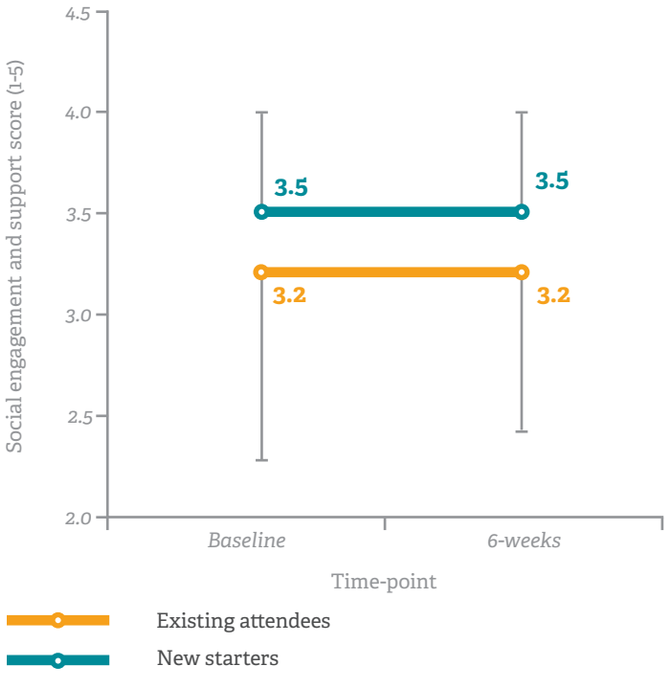
Figure 16. Mean (± 1 SD) baseline and 6-week reported social engagement and support score by attendee classification



Baseline to 12-weeks

Of individuals who reported on the social engagement and support items both at baseline and at 12-weeks, 40% reported an improvement (20% reported no change; there were no instances of possible ceiling or floor effects); as with baseline to 6-weeks, mean change was an improvement of 0.7%, which was not statistically significant. Mean improvement was contributed to only by existing attendees, as mean baseline and 12-week scores for new starters did not change; see Figure 17. Taken together with qualitative feedback reported in section 3.3.2, the findings across both baseline to 6-weeks and baseline to 12-weeks comparisons indicate that Wildlife Trust activities contributed to maintained or increased social engagement and support across at least 70% of the sample.

Figure 17. Mean (± 1 SD) baseline and 12-week reported social engagement and support score by attendee classification



3.1.5 Feelings of health

Feelings of health were measured using a bespoke item whereby participants responded to the question: 'On a scale of 1 – 10, how healthy do you feel at the moment (circle one number only)', by circling a number along a scale from 1 'Not at all positive to 10 'Very positive'.

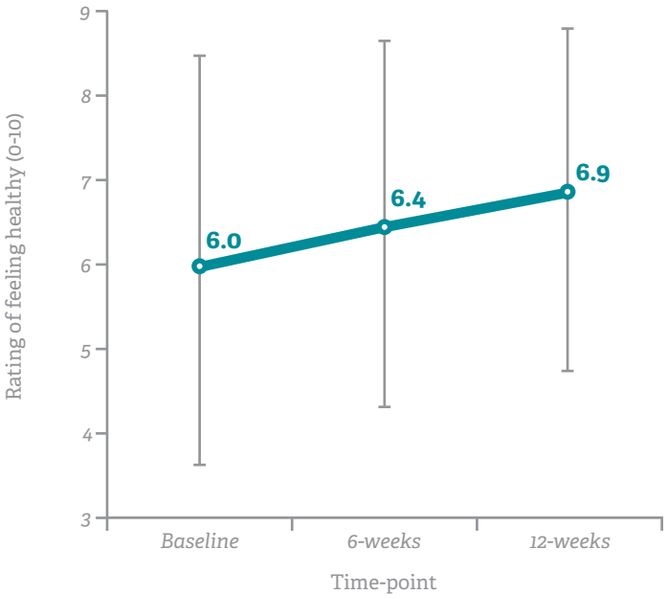
Data across all three time-points

Data collected across all three time-points demonstrated that after accounting for variation in the amount of time that participants had already (at baseline) been attending the Wildlife Trust projects, **participants' reported feelings of health improved to a statistically significant extent across the three time-points**[y], and that this improvement was not

[y] $F_{2,64} = 8.56$, $p = 0.001$

impacted to a statistically significant extent by the length of time that participants had already been attending the Wildlife Trust projects. As shown in Figure 18, improvements over the 12-weeks was steady, with a percentage increase of 7% from baseline to 6-weeks, and a further percentage increase of 8% from 6-weeks to 12-weeks. Two respondents reported the maximum score of 10 at all time-points, indicating a small potential influence of ceiling effects. There were no instances of potential floor effects.

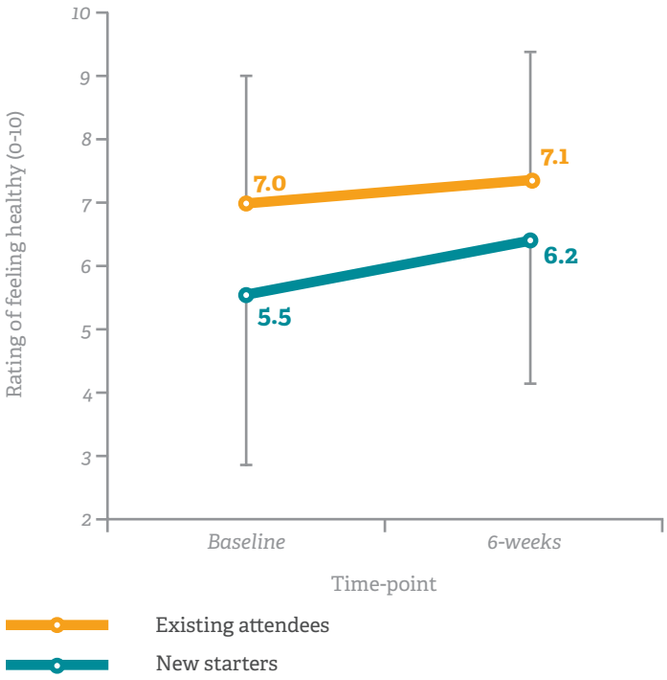
Figure 18. Mean (± 1 SD) Feeling healthy scores by time-point; data collected from participants across all three time-points



Baseline to 6-weeks

Of individuals who reported feelings of health both at baseline and at 6-weeks, 46% reported an improvement (33% reported no change; there were two instances of possible ceiling effects whereby highest possible scores were given at both time-points); mean change was an improvement of 5.5%, although this did not represent a statistically significant effect. Over this time period, new starters reported greater improvement (12% mean increase in score) than existing attendees (1% mean increase in score), although this difference was not statistically significant. See Figure 19.

Figure 19. Mean (± 1 SD) baseline and 6-week feeling healthy scores by attendee classification



Baseline to 12-weeks

Of individuals who reported feelings of health both at baseline and at 12-weeks, 50% reported an improvement (31% reported no change; there were three instances of possible ceiling effects whereby highest possible scores were given at both time-points); mean change was an improvement of 12%, which was statistically significant[z]. Over this time period, new starters reported significantly greater improvement (mean 39% increase in score) than existing attendees (mean 3% increase in score)[aa]. See Figure 20.

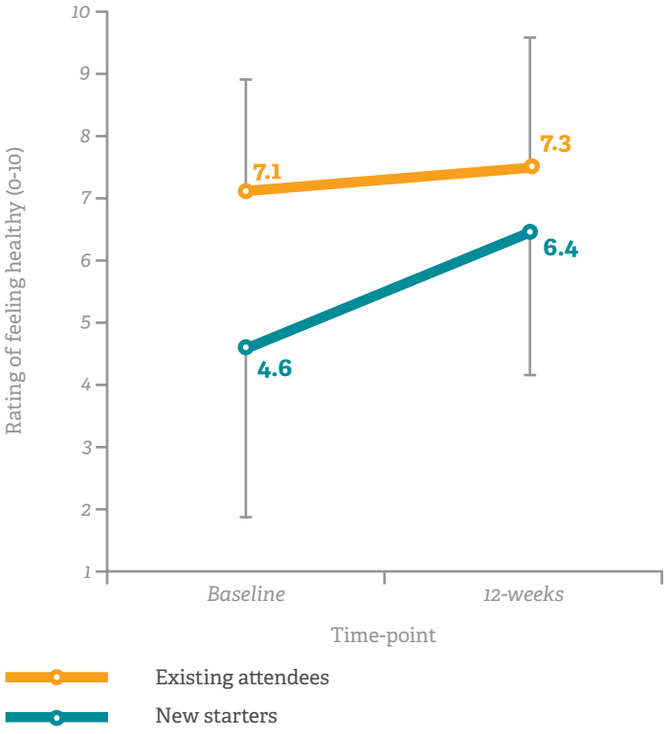
The data both for baseline to 6-weeks and baseline to 12-weeks suggests it to be likely that existing attendees reported smaller improvements in feeling healthy over time because they had more positive scores at baseline.



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[z] $F_{1,39} = 18.82$, $p < 0.001$, [aa] $F_{1,39} = 11.41$, $p = 0.002$

Figure 20. Mean (± 1 SD) baseline and 12-week feeling healthy scores by attendance classification



3.2 Health and environment-related behaviours

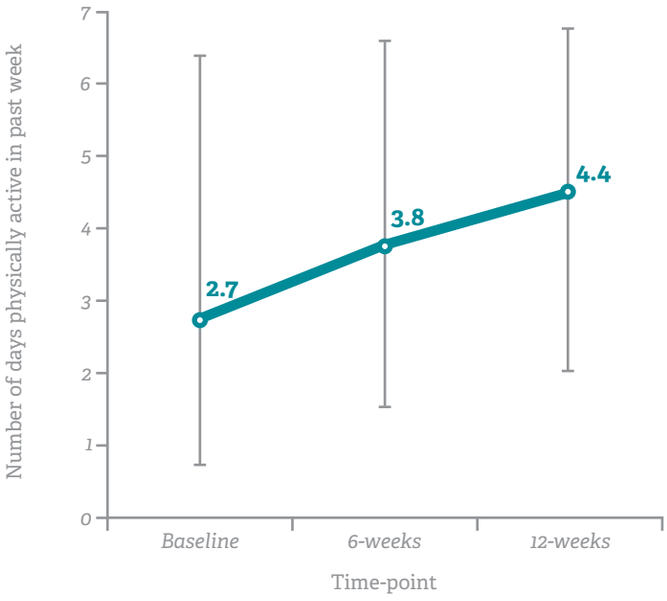
3.2.1 Physical activity

Participants reported their physical activity levels over the past week, via a validated single item taken from the International Physical Activity Questionnaire (IPAQ)[19]. In response to the question *'In the past week, on how many days have you done a total of 30 minutes or more of physical activity which was enough to raise your breathing rate? This may include sport, exercise, brisk walking, cycling or gardening for recreation or to get to and from places'*, participants ticked one of eight boxes labelled from '0 days' to '7 days'.

Data across all three time-points

Data collected across all three time-points demonstrated that after accounting for variation in the amount of time that participants had already been attending the Wildlife Trust projects (at baseline), **reported physical activity increased to a statistically significant extent across the three time-points**[bb]. This analysis also indicated that when not statistically controlled for, the amount of time that participants had already been attending the Wildlife Trust projects (at baseline) significantly influenced the reported change in physical activity levels over time; the newer that individuals were to the Wildlife Trust projects, the greater the reported increase in physical activity level across the measured time-points[cc]. As shown in Figure 21, reported number of physical activity days rose by 40% from baseline to 6-weeks, and by a further 15% from 6-weeks to 12-weeks. Two respondents reported the maximum response of 7-days at all time-points, indicating a small potential influence of ceiling effects. There were no instances of potential floor effects. In line with the facet of 'be active' within the New Economic Foundation's five ways to wellbeing, these findings evidence that Wildlife Trust projects function to boost physical activity, which itself brings physical and mental wellbeing benefit.

Figure 21. Mean (± 1 SD) reported number of days physically active in past week by time-point; data collected from participants across all three time-points





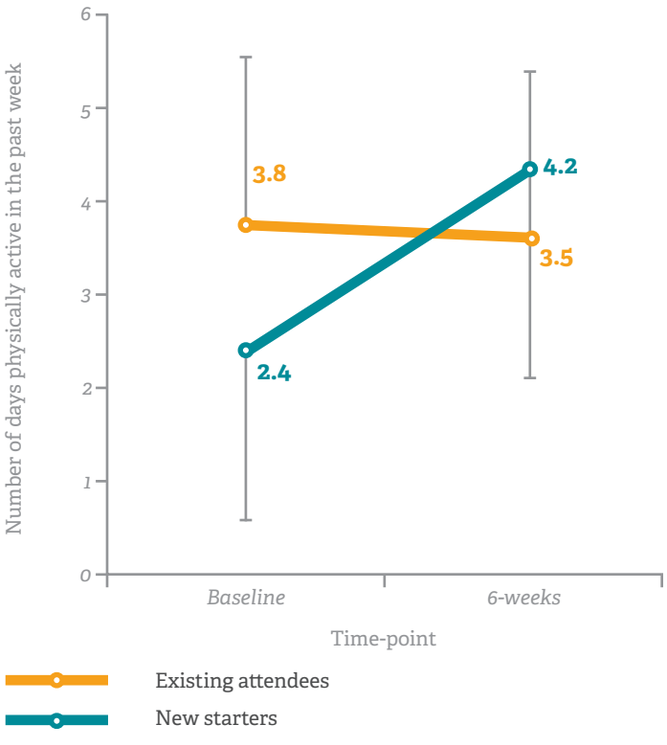
© David Plummer

[bb] $F_{2, 66}$ = 19.29 p< 0.001, [cc] $F_{2,66}$ = 5.12, p= 0.009

Baseline to 6-weeks

Of individuals who reported their physical activity levels both at baseline and at 6-weeks, 48% reported an increase in their physical activity levels (22% reported no change; there were four instances of possible ceiling effects whereby lowest possible responses (0-days) were given at both time-points); mean change was an increase of 15%, representing a statistically significant effect[dd]. Over this time period, new starters reported a large percentage increase in reported physical activity level (77% mean increase), whereas existing attendees reported an 8% mean decrease in number of physical activity days in the past week[ee]; see Figure 22. Project participation may generally function to increase individuals' physical activity levels, although minor fluctuations in physical activity level occur week-to-week.

Figure 22. Mean (± 1 SD) baseline and 6-week reported number of days physically active in past week by attendee classification

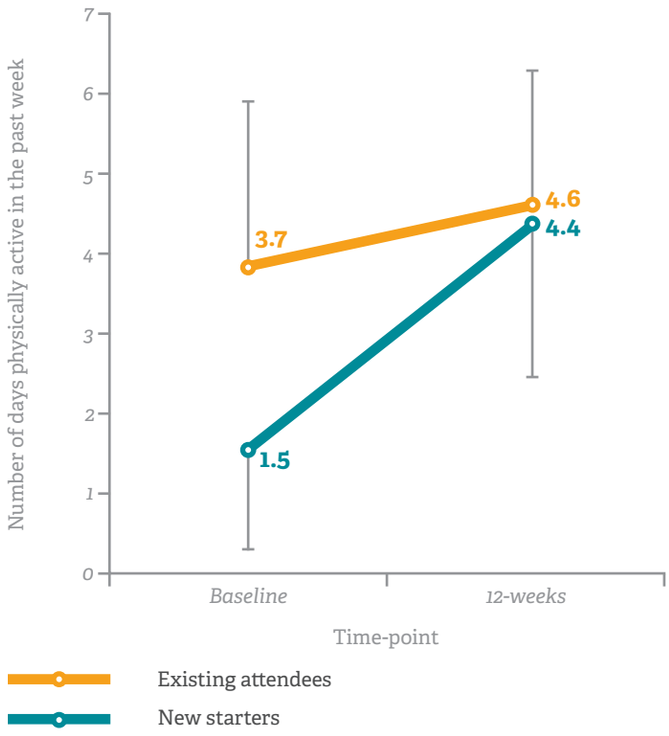


Baseline to 12-weeks

Of individuals who reported their physical activity levels both at baseline and at 12-weeks, 60% reported becoming more physically active (16% reported no change; there were two instances of possible ceiling effects whereby highest possible responses (7-days) were given at both time-points, and there was one instance of a possible floor effect); mean change was an increase in activity level of 52% (1.5 days per week), representing a statistically significant effect[ff]. From baseline to 12-weeks, new starters nearly trebled the number of days that they were physical active, with a mean reported increase of 2.9 days (195% mean increase). Existing attendees, who reported 23% (0.9 days per week) increase[gg]. See Figure 23.

The data both for baseline to 6-weeks and baseline to 12-weeks suggests it to be likely that compared to new starters, existing attendees reported either smaller mean physical activity increases (baseline to 12-weeks), or small mean decreases (baseline to 6-weeks), because they were more physically active at baseline.

Figure 23. Mean (± 1 SD) baseline and 12-week reported number of days physically active in past week by attendee classification



[dd] $F_{1,51} = 8.46$, $p = 0.005$, [ee] $F_{1,51} = 16.70$, $p < 0.001$, [ff] $F_{1,40} = 31.78$, $p < 0.001$, [gg] $F_{1,40} = 9.52$, $p = 0.004$

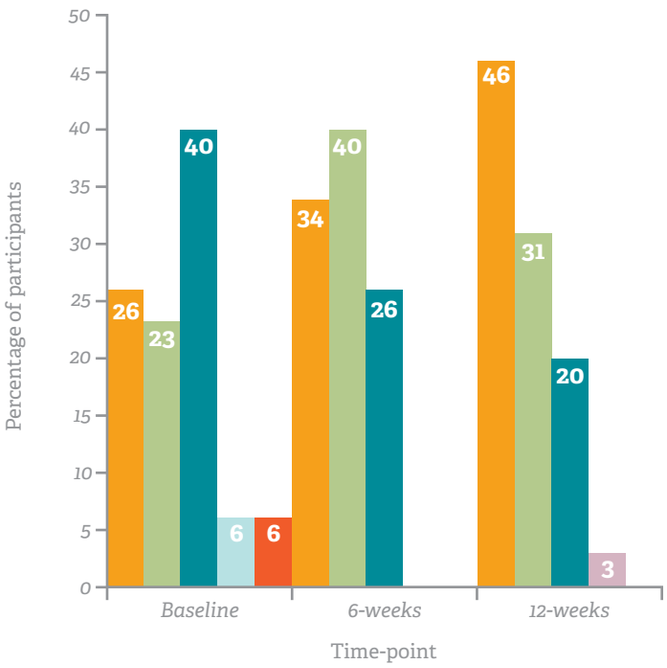
3.2.2 Contact with greenspace

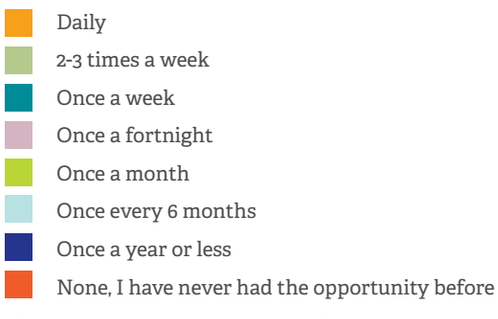
Participants reported on the normal frequency of their contact with greenspaces, by responding to the question *'How much contact do you normally have with green space? (e.g. going to the park;, wood, countryside, beach etc.)'*. Tick box options for responses were 'daily; 2-3 time a week; once a week; once a fortnight; once a month; once every 6 months; once a year or less; none, I have never had the opportunity'.

Data across all three time-points

Data collected across all three time-points demonstrated a statistically significant shift towards higher frequency contact with greenspace[hh], and that this change was not impacted to a statistically significant extent by the length of time that participants had already been attending The Wildlife Trust projects. As shown in Figure 24, the percentage of participants who reported having contact with greenspace more than once a week rose from 49% at baseline, to 74% at 6-weeks, and 77% at 12-weeks. Five respondents reported the maximum response of 'daily' at all time-points, indicating a small potential influence of ceiling effects. There were no instances of potential floor effects.

Figure 24. Frequency of greenspace contact by time-point; data collected from participants across all three time-points



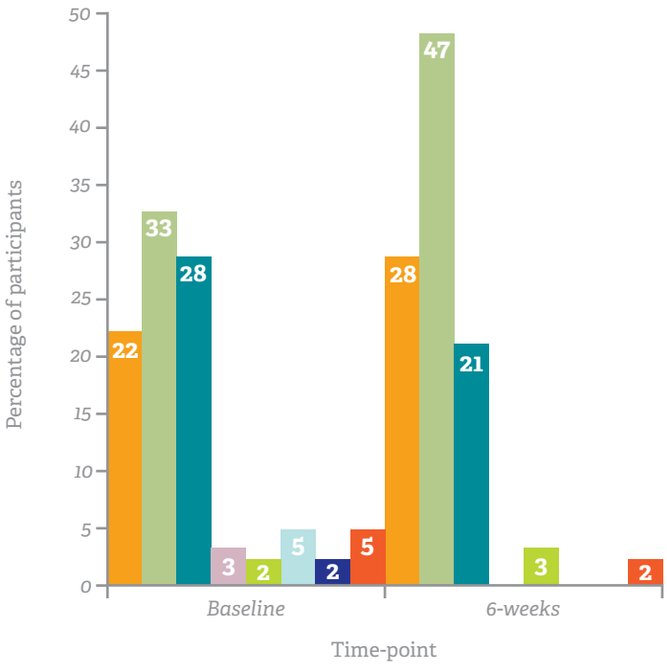


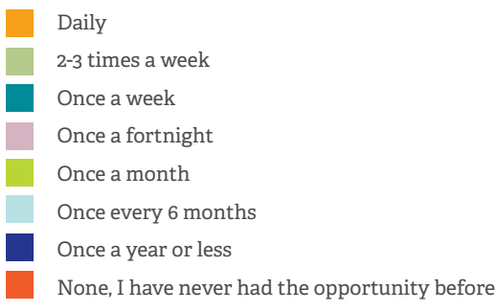
[hh] $F_{2, 64}$ = 10.22, p= 0.002 / $x2$ (2)= 11.52, p= 0.003, [ii] Z = 2.73, p= 0.006

Baseline to 6-weeks

Of individuals who reported on their frequency of greenspace contact both at baseline and at 6-weeks, 34% reported an increase in contact frequency (55% reported no change; there were ten instances of possible ceiling effects whereby the highest possible response (daily) was given at both time-points); and this shift was a statistically significant effect[ii]; see Figure 25. The percentage of individuals reporting contact with greenspace more than once per week rose from 55% at baseline to 75% at 6-weeks, and it can be assumed that these percentages were contributed to by on-going attendance to Wildlife Trust projects.

Figure 25. Frequency of greenspace contact reported at baseline and 6-weeks

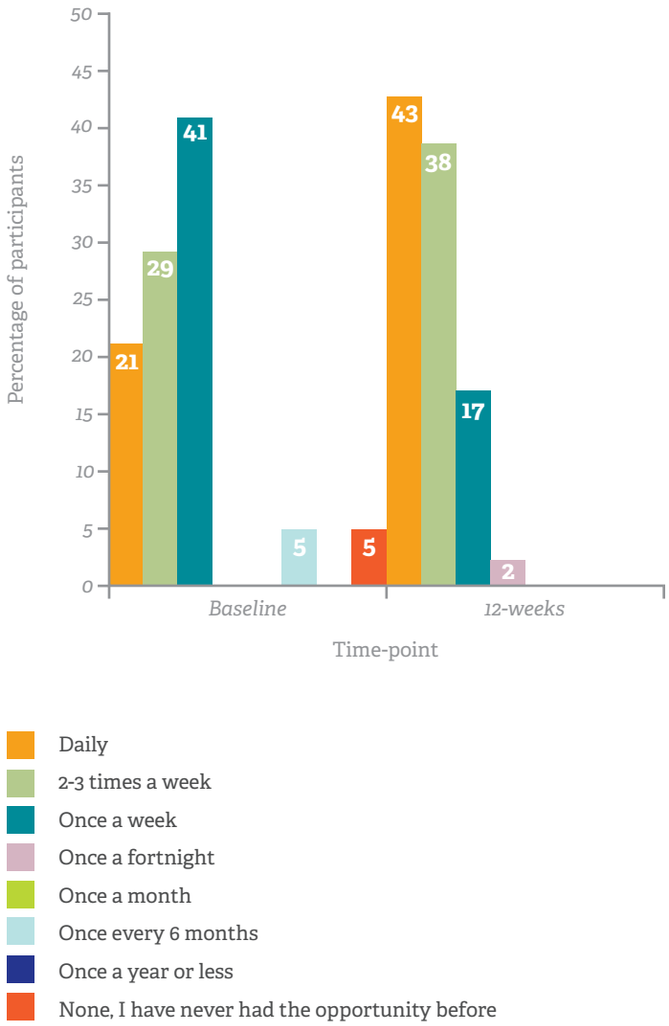




Baseline to 12-weeks

Of individuals who reported their frequency of greenspace contact both at baseline and at 12-weeks, 47% reported an increase (43% reported no change; there were six instances of possible ceiling effects whereby the highest possible response (daily) was given at both time-points); this change was statistically significant[jj]; see Figure 26). Similar to the noted change from baseline to 6-weeks, the percentage of individuals reporting contact with greenspace more than once per week rose from 50% at baseline to 81% at 12-weeks, and it can be assumed that these percentages were contributed to by on-going attendance to Wildlife Trust projects.

Figure 26. Frequency of greenspace contact reported at baseline and 12-weeks



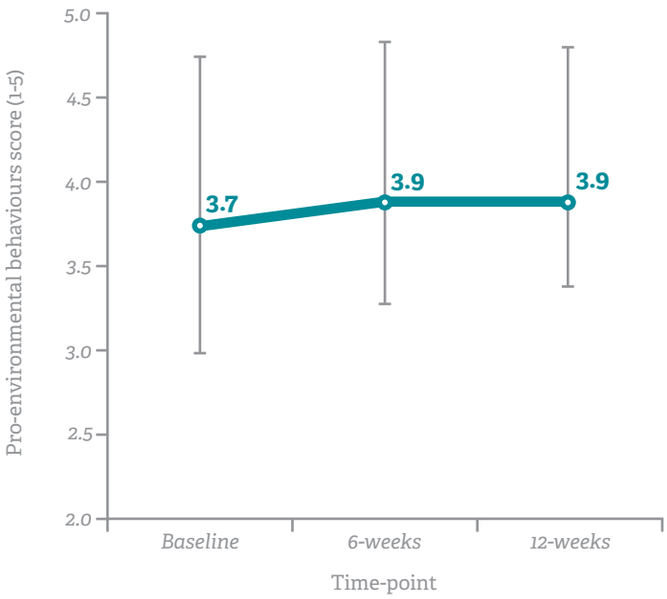
3.2.3 Pro-environmental behaviours

To assess levels of participants' pro-environmental behaviour, questions were asked relating to environmental behaviour indicators for sustainability (from previous University of Essex research[20,21]). The set of seven questions was adapted from the original 14, referring to practices that are relatively easily achievable and require little or no cost (e.g. turning off power at the plug when appliances are not in use). Responses were scored on a five-point Likert scale where respondents were asked to choose from '5 - always', '4 - often', '3 - sometimes', '2 - rarely' and '1 - never'. Overall behaviour scores were calculated as the average (mean) score across the seven items. Pro-environmental behaviour scores therefore range from a minimum of 1 to a maximum of 5.

Data across all three time-points

Data collected across all three time-points demonstrated that after accounting for variation in the amount of time that participants had already (at baseline) been attending the Wildlife Trust projects, **pro-environmental behaviour scores increased to a statistically significant extent**[kk]. This analysis also indicated that when not statistically controlled for, the amount of time that participants had already been attending The Wildlife Trust projects significantly influenced the reported changes; the newer that individuals were to The Wildlife Trust projects, the greater the reported increase in pro-environmental behaviours across the measured time-points[ll]. As shown in Figure 27, following a 6% increase from baseline to 6-weeks, scores then plateaued. There were no instances of possible floor or ceiling effects.

Figure 27. Mean (± 1 SD) pro-environmental behaviour scores by time-point; data collected from participants across all three time-points

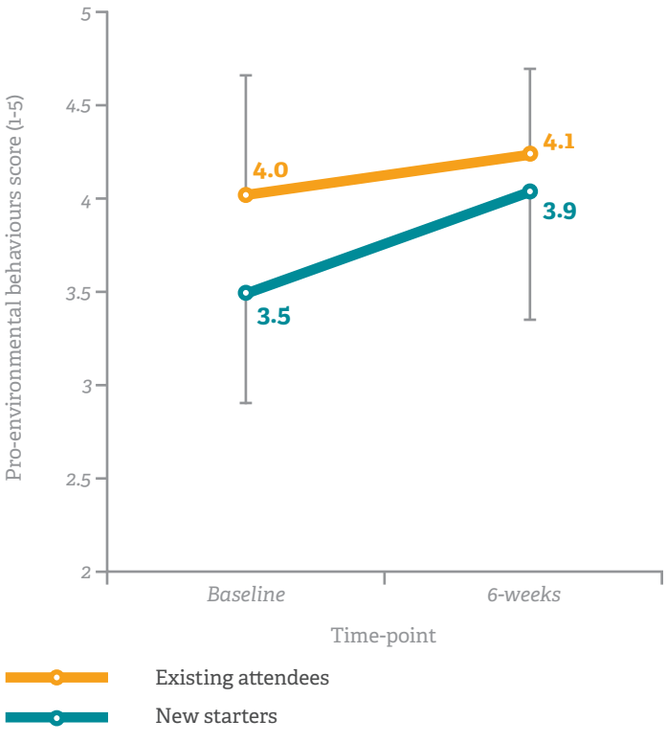


[jj] $Z = 3.03$, $p = 0.002$, [kk] $F_{2,66} = 9.62$, $p < 0.001$, [ll] $F_{2,66} = 3.64$, $p = 0.032$

Baseline to 6-weeks

Of individuals who reported on the measure of pro-environmental behaviours both at baseline and at 6-weeks, 54% reported an increase (27% reported no change; there were two instances of possible floor effects whereby lowest possible responses ('never') were given at both time-points); mean change was an improvement of 5%, representing a statistically significant effect[mm]. Over this time period, new starters reported significantly greater improvement (9% mean increase in score) than existing attendees (2% mean increase in score)[nn]; see Figure 28.

Figure 28. Mean (± 1 SD) baseline and 6-week pro-environmental behaviour scores by attendee classification

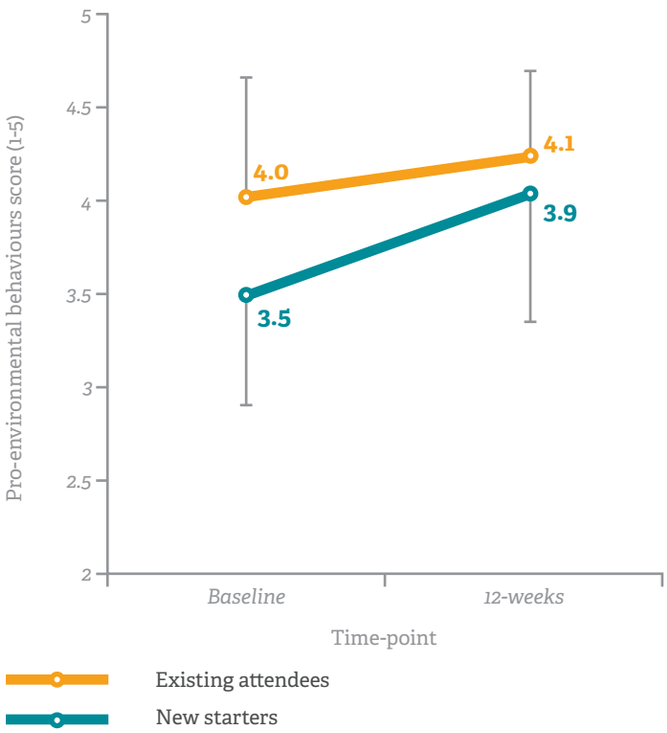


Baseline to 12-weeks

Of individuals who reported on the pro-environmental behaviour items both at baseline and at 12-weeks, 55% reported an increase (26% reported no change; there were no instances of possible ceiling or floor effects); mean change was an increase of 6%, representing a statistically significant effect[oo]. Over this time period, new starters reported significantly greater increase (mean 15% increase in score) than existing attendees (mean 1% increase in score)[pp]; see Figure 29.

The data both for baseline to 6-weeks and baseline to 12-weeks suggests it to be likely that existing attendees reported smaller increases in pro-environmental behaviour over time because they had higher scores at baseline.

Figure 29. Mean (± 1 SD) baseline and 12-week pro-environmental behaviour scores by attendance classification



3.3 Feelings, perceptions and thoughts about project participation

3.3.1 Rated importance of project-related aspects

Participants were asked to indicate how important they felt that a listed series of aspects of Wildlife Trust activities were. The list of elements was as follows: *'Improving the natural environment; Improving fitness; Learning new skills; Being part of a group; The conservation activities; Being outside in nature; Improving mental health'*. Answers were reported via a five-point Likert scale with a label at each pole (0 – Not very important; 5 – Very important), whereby participants were asked to: *'Please put a cross somewhere on the line to tell us how important you find each of the following'.*

Data across all three time-points

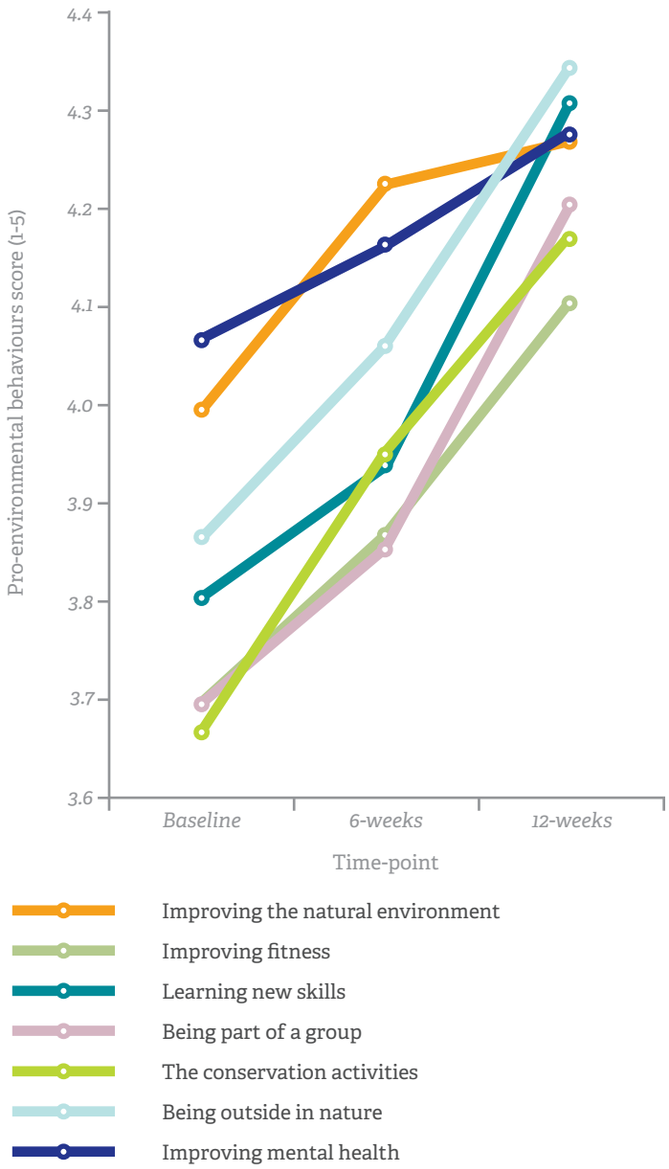
The rated importance of the range of aspects increased from baseline to 6-weeks and further from 6-weeks to 12-weeks; and after accounting for variation in the amount of time that participants had already (at baseline) been attending the Wildlife Trust projects, this effect was statistically significant[qq]. In isolation, for each aspect other than importance of mental health, the changes in rated importance over time were statistically significant ($p < 0.05$; Figure 30). That at baseline improving mental health was reported as the most important aspect of attending the Wildlife Trust projects may partly explain the lack of significant increase across the 12-weeks for this aspect. Indeed, four participants (12.5% of the sample) reported maximum values for

[mm] $F_{1,51} = 14.19$, $p < 0.001$, [nn] $F_{1,51} = 4.23$, $p = 0.045$, [oo] $F_{1,39} = 17.44$, $p < 0.001$, [pp] $F_{1,39} = 10.98$, $p = 0.002$, [qq] $F_{14,90} = 2.57$, $p = 0.004$

this item across all three time-points, indicating a ceiling effect. This analysis also indicated that when not statistically controlled for, the amount of time that participants had already been attending the Wildlife Trust projects significantly influenced the reported changes; the newer that individuals were to the Wildlife Trust projects, the greater the reported increases in the rated importance of the different aspects across the measured time-points[rr].

Across the 12-weeks, conservation activities were the aspect of projects that increased most in attendees' rated importance, indicating that this element of projects may grow as a mechanism that encourages continued project attendance. Intrinsic motivation, that is, motivation for the conservation activities in their own right, is a key predictor of future behaviour[22]. Importantly, conservation activities offer opportunity for continued learning, which is one of the five ways to wellbeing, as well as serving as a perceived initial vehicle for other important aspects, such as mental health improvements and being outside in nature.

Figure 30. Rated importance of project-related aspects by time-point; data collected from participants across all three time-points



Baseline to 6-weeks and Baseline to 12-weeks

For individuals who rated the perceived importance of project-related aspects both at baseline and at 6-weeks, and similarly, for individuals who rated the perceived importance of project-related aspects both at baseline and at 12-weeks; whereas mean increases were reported by new starters for every aspect, this was not the case for existing attendees, who reported a mixture of relatively small increases and decreases across the aspects. As shown in Figures 31 and 32, for most rated aspects, at baseline, existing attendees rated these as more important than did new starters. Together, these observations suggest that early engagement with Wildlife Trust projects promotes increased perceived importance of issues such as conservation and being part of a group, which might then generally remain heightened despite minor fluctuations. For all data sets, mental health improvements were the most highly rated by new starters as most important at baseline, indicating this to be the primary motivation for attendance, and confirming that at-risk individuals view Wildlife Trust projects as therapeutic treatment options.



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[rr] $F_{14,90} = 2.33$, $p = 0.009$

Figure 31. Mean (± 1 SD) rated importance of project-related aspects by time-point (Baseline; 6-weeks) and attendee categorisation

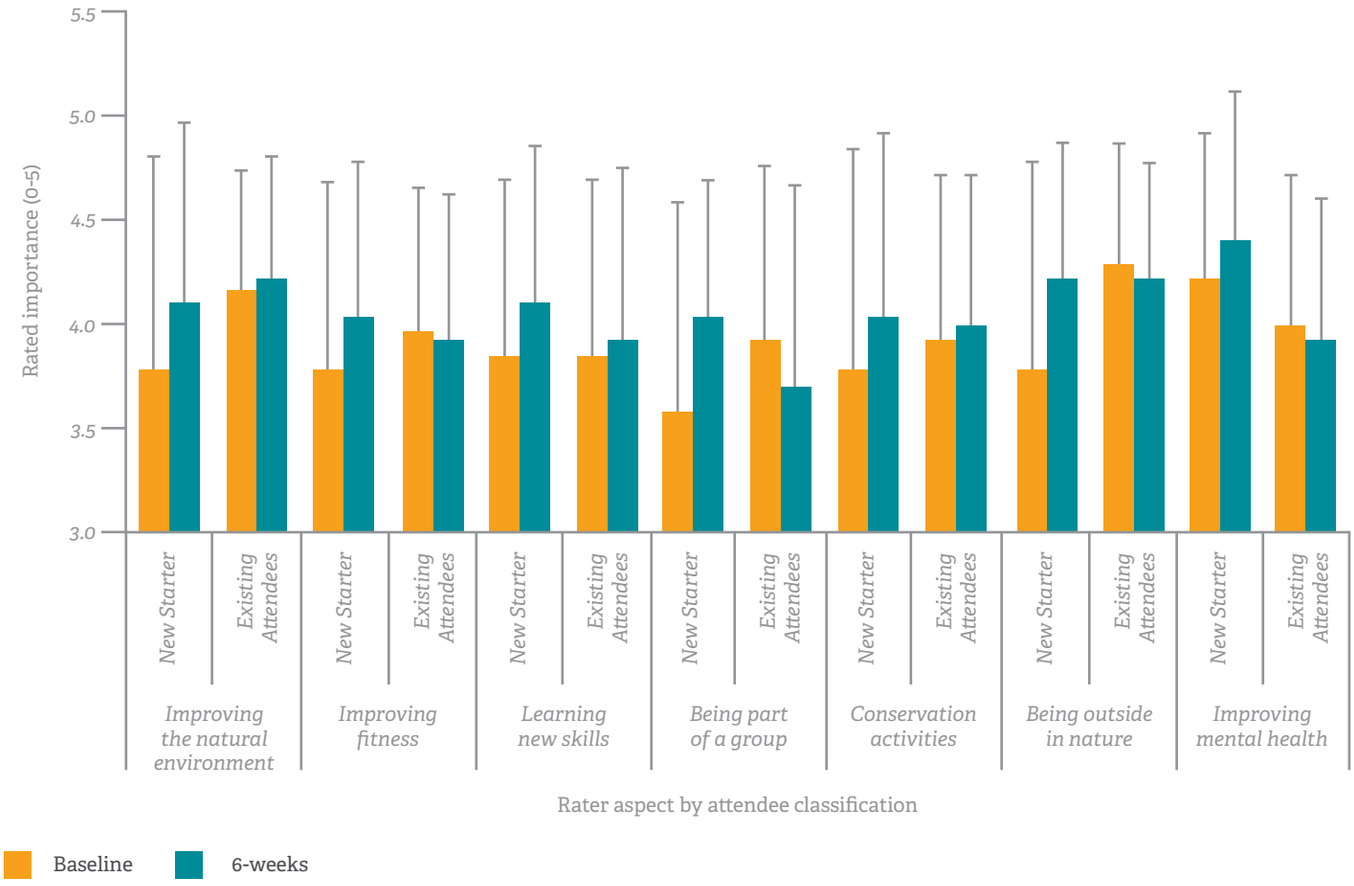
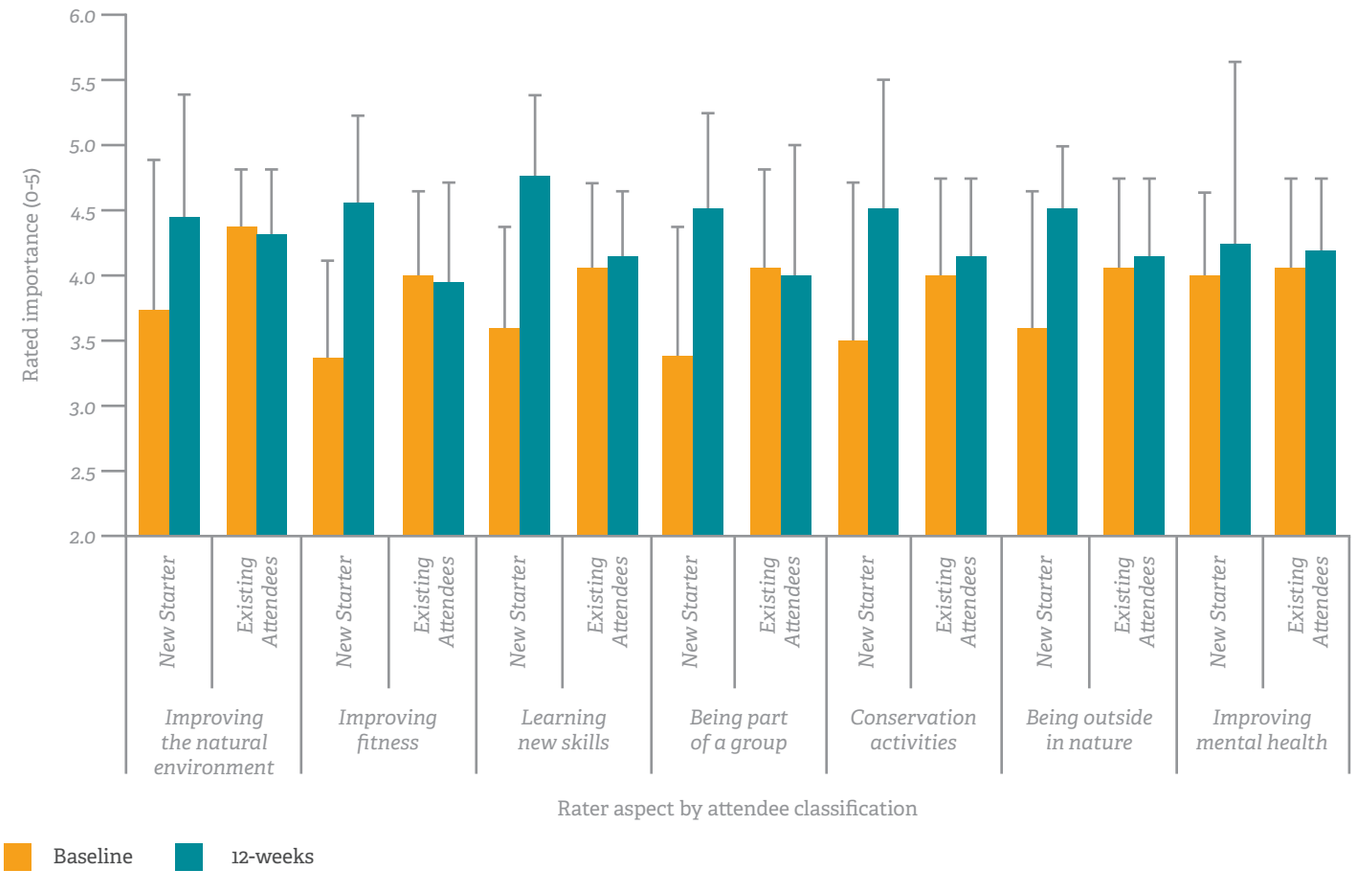


Figure 32. Mean (± 1 SD) rated importance of project-related aspects by time-point (Baseline; 12-weeks) and attendee categorisation



3.3.2 Qualitative insight

Three questions sought to gain qualitative insight into attendees' thoughts and experience in relation to The Wildlife Trust projects that they attended. In the baseline questionnaire, participants were asked for 'Any further comments', with a box allowing for free written answers. In the 6-weeks and 12-weeks questionnaires, participants were asked:

- 'has participating in this project changed how you feel about yourself, and if so, how?'
- 'has participating in this project changed how you feel about nature, and if so, how?'
- and 'has participating in this project changed how you feel about other people, and if so, how?'

Findings

Very few participants responded to the opportunity to provide 'any other comments' within the baseline questionnaire. Within the 6-weeks and 12-weeks questionnaires, respondents indicated that their attendance at Wildlife Trust projects had led to enhanced confidence, particularly in relation to their social lives. Attendance also led to enhanced sense of purpose, which underpins a drive for further engagement in the projects and other community-orientated, wildlife and conservation activities that encompass the five ways to wellbeing facet of 'give'. Qualitative insight also evidenced increases in individuals positivity, connection to nature and both physical and mental wellbeing. In relation to their feelings about nature, project engagement promoted increased enjoyment of, and desire to learn more about the natural environment. It also enhanced individuals' self-perceived awareness of nature, and the importance of nature to them. Finally, attendance appears to have reduced social isolation, with participants viewing others more positively than they previously had, particularly others with whom they would not otherwise have interacted. This finding, together with that of enhanced social confidence, evidences that Wildlife Trust projects function to promote the five ways to wellbeing facet of 'connect' (Tables 2 – 4).

Table 2. Qualitative insight: participants' changed feelings about themselves

Theme	Examples
Enhanced confidence, particularly socially	'Social confidence.' 'I can now talk with other people easier.' 'I feel a better sense of purpose and belonging by being part of a team.' 'I know more about gardening and project work – that's given me confidence.' 'Made me more confident and I have good respect for all people.' 'It makes me feel connected. It's increased my confidence; gives me something to live for.'
Enhanced positivity and sense of purpose	'I feel more positive.' 'I feel a better sense of purpose and belonging by being part of a team.' 'I really enjoy going out with the Wildlife Trust and look forward to it every week.' 'I feel stronger.' 'Makes me feel that everything I do has an effect on society.' 'I'm feeling less despondent and hopeless. The arrival of spring had definitely improved my mood.' 'Yes I have more self worth as it gives me purpose so I don't feel lost as often.'
Increased connection to nature	'A little bit changed in a good way. Listening to birds enjoying learning about plants and gardening.' 'Yes, I feel more connected to nature and my environment and have developed interests in this area.' 'I feel engaged with nature and the environment.'
Enhanced mental and physical wellbeing	'Since I retired 7 years ago this project has been essential to my well-being - mental and physical.' 'Happier, more confident.' 'Yes. I feel happier in myself.'

Table 3. Qualitative insight: participants' changed feelings about nature

Theme	Examples
Increased awareness and importance of nature to self	'I have a greater appreciation for birds, bees, insects, plants and trees.' 'Made me more aware of the need for conservation and enhancement of what's there.' 'Yes, it's nice to know more and understand what is going on in nature.' 'I have discovered more about wildlife and nature and feel more confident to discuss it and promote its importance.' 'Its much more important to me now.'
Stimulated a desire to learn more about nature	'Yes it'd made me sit in garden more and look at the plants and look out for birds.' 'Yes, I am now interested in learning the names of things and how they exist together.' 'Yes, eyes have been opened to a better understanding of wildlife.'
Enhanced enjoyment of the environment	'Made me feel more content and happy about nature than I ever have.' 'Yes I love & appreciate it even more.'

Table 4. Qualitative insight: participants' changed feelings about other people

Theme	Examples
View others more positively than they previously did	'It's restoring my faith in human nature.' 'Most people are good and kind, unlike the media's portrayal.' 'More sociable and generous.'
Created positive new relationships with new sections of society (project activities serving to bring community together)	'Our group is so diverse that it has opened my eyes to how different people all care for nature.' 'Heightened awareness of how this kind of activity can help everyone.' 'Great to meet with a very wide range of people from all sorts of backgrounds.'
Reduced social isolation	'I'm not alone with my mental health, plenty of others have similar issues and setbacks.' 'Yeah meet more people.' 'Good to be part of a group.'

4. Key findings and Conclusions

For mental and physical health, analyses of the data revealed that Wildlife Trust projects are successfully accessing low wellbeing individuals, and that **six to twelve weeks' attendance to those projects was associated with statistically significant improvements in individuals' mental wellbeing, with the percentage of participants reporting low wellbeing scores (defined by UK norms) declining from 39% at baseline to only 19% at 12-weeks**. Indeed, to a statistically significant extent, the positive impact on mental wellbeing was greater for individuals with low wellbeing to start with (compared to individuals who had average to high wellbeing to start with). **95% of participants with low wellbeing at baseline reported an improvement at 6-weeks, and for the baseline to 12-weeks sample, this figure was 83%. Attendance was also associated with statistically significant improvements in feelings of positivity, health, and nature relatedness**.

Regarding health- and environment-related behaviours, participants reported statistically significantly enhanced levels of pro-environmental behaviour and physical activity, as well as increased frequency of contact with greenspaces. For all health-related, and behaviour-related measures other than greenspace contact frequency, new starters reported greater mean improvements and increases over time, than did existing attendees. For some measures, minor worsening / decreases were reported by existing attendees over time; together, these observations suggest that early engagement with Wildlife Trust projects promotes large improvements and increases in the measured parameters, which with continued attendance might then generally remain heightened despite minor fluctuations.

Across the three measured time-points, new starters reported increases in the importance they placed on improving the natural environment, improving fitness, learning new skills, being part of a group, conservation activities, being outside in nature and improving mental health. Across the 12 weeks, the importance of 'conservation activities' and 'learning new skills' increased the most in attendees' rated importance, indicating that they could be key drivers of attendance. Intrinsic motivation enhances the likelihood of adherence to a behaviour. Learning new skills is one of the five ways to wellbeing.



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Qualitative feedback evidenced that project attendance functioned to enhance individuals' sense of purpose, self- and social-confidence, and their physical and mental health and wellbeing. As well as changes in how individuals felt about themselves, attendance was associated with changes in the way that individuals felt about other people (notably individuals viewed others more positively, creating positive relationships with new sections of society, thereby reducing their own perceived social isolation) and about nature (increased awareness of nature and a new-found desire to learn more about the environment).

Phase 3 of this work directly demonstrates, in a robust scientific way, that Wildlife Trust activities are associated with health and wellbeing improvements for attendees, and function to enhance related behaviours. Indeed, this research evidences that Wildlife Trust projects are associated with positive changes in measurable variables that map onto each of the five ways to wellbeing. It also gives insight into what some of the instrumental processes behind such impacts might be. That **Wildlife Trust projects have been shown to deliver health and wellbeing benefits indicates that they offer an important non-medical service that does, and can further function to reduce the current burden on the NHS**; the Wildlife Trusts should deliver this evidence with confidence to external audiences, to demonstrate and promote the efficacies of Wildlife Trust activities. The methodology piloted here can also be replicated and scaled up in order to gather both longitudinal and UK–wide data across Wildlife Trusts in the future.

Future research might be strengthened through inclusion of a control group of matched individuals from local areas who do not attend Wildlife Trust projects, so to better-demonstrate causality of outcomes from project attendance. Using three paths in analysing the data was successful in maximizing use of the data collected, although it was used only in response to achieving less data collected that originally expected. Within the suggested up-scaled research, greater consistency in data collection across all of the three time-points would allow for simpler analysis, that is, commitment to Path 1 only, and therefore clearer messages from the data. Where they were not made in the current research, greater sample sizes would also enable comparisons between activity types and other splits in data such as age, gender and vulnerable group classification, so to elucidate which groups benefit most from different activity types.

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6. Appendix

6.1 Descriptions of projects

MyPlace

Lancashire Wildlife Trust's 'Myplace' was co-developed with Lancashire Care NHS Foundation Trust and runs between 2016 and 2020. It engages young people aged 13 – 24 in a range of 'ecotherapy' activities aimed at building resilience and developing new skills. Funded by the Big Lottery as part of the 'Our Bright Future' programme, it is one of 31 projects engaging young people and supporting them to become the environmental champions of tomorrow. It is intended that the partnership continues beyond 2020, based on the outcomes that the project achieves.

The two organisations have developed an approach that enables clinical practitioners to refer young people being treated in mental health services, directly into the project; both as a preventative and therapeutic intervention. Young people are also able to self-refer.

They initially attend 1 session a week that lasts for 2 hours. Once on site, the young people are encouraged to identify and develop their own project ideas. The staff provide them with a range of activities that consist of practical conservation work, mindfulness exercises, growing, wildlife awareness walks and bushcraft. Their activity can also be accredited through the John Muir Environmental Awards.

Over 200 young people have been engaged over the past year, benefitting from improved physical and mental health as well as a range of new skills and knowledge. In addition, many of them have acquired a new outlook for their future; local greenspaces have enhanced wildlife habitat, and the people living in nearby communities have benefitted from improved access.

Going forward, there are encouraging signs that local health commissioners see the delivery model as a credible and evidenced form of preventative and early intervention treatment for mental health services. In addition, a local Pupil Referral Unit that has engaged with the Myplace project consistently over the past 12 months and has recorded some dramatic transformations in some of its students, particularly in terms of behaviour and motivation. The Myplace project has also been recognised by a nomination in the 'Youth Leadership Award' category of the local 'Fusion' Awards that annually celebrate achievements across Lancashire and the surrounding area in community development.



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Men in Sheds

Men in Sheds started in 2015 and is run by the Lancashire Wildlife Trust in partnership with 'Bolton at Home'. It is based at the Breightmet UCAN centre in Bolton, open to men of all backgrounds, but particularly welcomes older people or those who have had recent hospital stays. At the time of writing, it had engaged 35 people, helping them to build confidence and meet new people.

Sessions are weekly, between 10.00 am and 1.00 pm, during which participants undertake a range of activities from building bird tables, benches and hanging baskets to renovating old furniture and installing gates and bug hotels. Many local communities and organisations have benefitted from the products that have been made during the sessions by participants.

The shed has also supported various community groups, schools and other Lancashire Wildlife Trust projects, by taking on larger projects, such as repairing walls and fences, installing reed bed filtration systems, maintaining tools and repairing machinery.

The group is now well-established, with the participants attending as part of a regular social life. The 'shedders' have found a purpose and outlet for their talents and skills. They are also better connected to their local community which has helped them to feel valued, giving them an increased sense of achievement and self-confidence.

The success of the project has resulted in the Lancashire Wildlife Trust securing additional funding to start 2 new Men in Sheds projects in the Lancashire area.

Nottinghamshire Wildlife Trust:

Recovery Project

The Recovery project was based at Idle Valley Nature Reserve in North Nottinghamshire. It started in 2009 and continued until 2016, when it became an independent charity, 'Muddy Fork', which continues to this day (June 2017).

'Recovery' was led by an experienced Project Coordinator at Nottinghamshire Wildlife Trust. Participants either made their own independent journey to the gardens using public transport or were picked up with a transport service subsidised by grants or by Bassetlaw District Council. The project provided a supportive and welcoming environment for individuals referred through healthcare services, or themselves. Vulnerable adults suffering from a wide range of mental health illnesses or diagnoses, including anxiety, psychiatric disorders, depression were engaged and supported, as well as adults with learning disabilities.

Each session started with a morning cuppa and chat in the centre about the day's planned activity. Individuals were usually tasked with activities to suit their needs or interests, as well as being encouraged to try new things. These were usually garden based, preparing beds, propagating, harvesting, maintaining as well as taking part in crafts such as willow weaving. Depending on the day's activity, a group walk on the reserve would often be programmed and off site activities on other reserves to help (for example) with tree planting would be arranged. The activity included distinctive opportunities for individuals to 'make a real difference' for people and for wildlife, whilst also providing practical, personal and life skills. Participants shared their packed lunch with leaders and volunteers and ideas and suggestions about the project would be shared.

At any one time, up to 15 participants took part in a session. Numbers varied, but usually sessions were close to capacity with occasional waiting lists. Supporting the project lead was a strong core team of dedicated and experienced volunteer leaders, including a retired GP, a healthcare professional, keen gardeners and naturalists. Their involvement provided professional and skilled support, ensuring that needs of vulnerable people were embedded form the start, and the project delivered high quality accessible opportunities. This also meant that the team understood the needs and challenges facing the healthcare sector.

Since the project began from its Ecominds routes, hundreds of individuals have participated. The project has been funded through multiple sources including, Ecominds (Lottery), CCG-Bassetlaw, Bassetlaw D C, Grant Making Trusts and donations. Nottinghamshire Wildlife Trust worked in partnership with key healthcare and wellbeing partners and professionals, including local GP's, Community Psychiatric Nurses (CPN's), Bassetlaw Community and Voluntary Services (BCVS), CCG (funders), Bassetlaw Hospital, as well as voluntary sector organisations. Since the funding from the CCG came to an end, the Recovery team have independently set up their own charity in 2016 called 'Muddy Fork' which continues to deliver weekly sessions at Idle Valley Nature Reserve, in partnership with Nottinghamshire Wildlife Trust.



© Nottinghamshire Wildlife Trust; The Recovery Project - now Muddy Fork

Keeping it Wild

Keeping it Wild is Nottinghamshire Wildlife Trust's youth project, which began as a funded project via HLF Young Roots Funding in 2014, and has since become core activity. Coordinated by a youth leader and Development Officer, the project has involved multiple partners such as Youth Offending Team, Youth Services, Schools, local groups and organisations and other Wildlife Trusts across the UK.

Keeping it Wild engages young people living across Nottinghamshire. Aimed at young people aged 13 – 23 years old, the project prides itself on engaging from a wide range of backgrounds and interests. The project encourages engagement from young people who may need support to improve their confidence and would benefit from activities as well as mentorship from the team. The group has a core membership of approximately 20 young people, who are very active. As the group mainly meet up in Nottingham city, irregular activity also takes place across the county to support wider engagement.

Young people meet weekly to plan events and project activity. Additionally, they also take part in weekend 'practical' conservation activities each month. These can include visits to a range of our reserves and also further afield to connect with other wildlife organisations or to take part in events.

The participants feel they are able to make a difference and that they have a voice and a purpose within the Trust and as a collective group. Individuals have grown in confidence as young adults and significantly benefited from leading their own projects and engaging the public in wildlife themed activity. They have learned a wide range of skills from wildlife identification, reserve management to event planning, fundraising and public speaking. Peer to peer support through the project has been strong, with young people mentoring and supporting each other.

The project is growing and evolving, and the group are leading areas of the activity which were not envisaged. They are becoming a strong voice and independent thinkers as young conservationists and this can be demonstrated through their involvement in events and when they meet with our Trustees and the public to share their project work.

Keeping it Wild is now core activity, and all youth work across Nottingham Wildlife Trust comes under that banner. The group are self-funding themselves and funds to support the group have been donated from a wide range of grants and trusts.



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Wellbeing through Nature

In the first half of 2016, Avon Wildlife Trust delivered a Wellbeing through Nature Pilot Project that provided a supportive programme of purposeful nature activities structured around the Five Ways to Wellbeing.

The programme worked in partnership with Montpelier and Horfield Health Centres who signposted their patients to the service. In addition to the targeted Health Centres they had applications or enquiries via The Care Forum (social prescribing providers), St Georges Health Centre, LIFT (talking therapy) and Maytrees Medical Practice.

Based at their Feed Bristol site with occasional visits to Folly Farm nature reserve, participants took part in food growing and conservation activities, learnt about wildlife and how nature can support their health and wellbeing.

Based on a GP referral process, once an application form was received the project officer would follow-up with a call to outline the programme activities, and to ascertain suitability, interests, skills, expectations and health and safety requirements. One to one catch ups were undertaken to identify individuals' needs ensuring activities were adapted to be inclusive and supportive to their wellbeing.

The project was aimed at people with long term health conditions, and those experiencing mild to moderate depression, anxiety or stress.



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Wildlife and Wild City Action Teams

Avon Wildlife Trust worked with two of their regular volunteering groups as part of this evaluation project. Wildlife Action is an established volunteering group that helps create, conserve and protect wildlife habitats on nature reserves across the West of England. The group consists of 15 to 20 volunteers. Wild City Action Team is a group working to help manage the diverse range of local wildlife sites across the City of Bristol.

Participants included people in retirement wanting to stay active, young people looking for a career in conservation, and those needing the social interactions and structure to their day. They met once a week for 12 weeks supported by staff from Avon Wildlife Trust and Feed Bristol.

Participants either met on site, or were picked up by minibus from their GP surgery and taken there. The project officer texted each participant prior to the day's session to encourage them to attend.

At the beginning of the session the group shared how they were feeling and what they had done during the week. Practical tasks were then assigned to individuals depending on their needs. Activities ranged from seed sowing, planting and weeding, clearing a woodland area and creating a dead hedge, external experts proving wildlife exploration, making insect homes, outdoor cooking, bushcraft and charcoal making.

A short mindfulness or sensory activity was undertaken after lunch followed by another practical activity. The group gathered at the end of each day to reflect on the activities, how they linked to the 5 ways to wellbeing, and how they felt as a result. Most of the participants had never undertaken wildlife gardening or food growing but all of them made a change outside the group in their own gardens or spaces.

Avon Wildlife Trust have further developed its service with support, training and mentoring from a health consultant. They are now delivering a successful Wellbeing Self-Care Course; a person-centred holistic approach to wellbeing which has already seen positive changes in people's behaviours and attitudes to their wellbeing and to nature. Avon Wildlife Trust are in discussions with Public Health to develop a set of Quality Standards in green care interventions.

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Gloucestershire Wildlife Trust:

Practical Conservation Social Prescribing

Gloucestershire Wildlife Trust run weekly conservation volunteering groups across the county. These are delivered on their Nature Reserves by staff with the support of trained volunteer wardens.

Since 2014, the two volunteer groups operating in Stroud District have been promoted as part of Gloucestershire's social prescribing system. Through the system, GPs can refer patients with health issues that do not require clinical intervention to a hub hosted by Stroud District Council. The hub links them to a range of community opportunities that would address the wider determinants of poor health or wellbeing.

Weekly practical conservation volunteering at Gloucestershire Wildlife Trust's reserves were offered as one of the social prescribing referral opportunities. Following a 6-month pilot period in 2014, social prescribing was rolled out across all GP practices in Stroud District in 2016. At the same time, the groups were promoted across their membership, website and through word of mouth. This generated self-referrals outside the formal social prescribing pathway.

The groups are aimed at anyone who wants to get active, spend more time outdoors in nature and/or contribute to local conservation work. Not everyone who has joined the group did so to improve their health and wellbeing, but many new and existing volunteers see as a benefit and for some it is the primary reason for joining. One of the main strengths of the practical conservation approach is that it doesn't come with the stigma of some other referral pathways. The approach has been effective in reaching people who seldom engage with regular healthcare pathways, particularly men aged between 55 and 75, who are under represented in the social prescribing system

The groups run once a week for between 4 and 5 hours. The participants undertake a range of practical conservation tasks such as coppice management, fencing, scrub clearance and green woodworking. The participants undertake moderate physical activity, at least once per week, benefitting from spending time in natural green spaces. The social networks they form, support to manage their own health conditions (examples include people with type-2 diabetes, and recovery from surgery and minor heart attacks) and the positive experience motivates them to continue participation.

Inclusive Volunteering Project

Tees Valley Wildlife Trust created the Inclusive Volunteering Project in 2006, involving a small group of patients from a local forensic mental health unit volunteering on nature reserves once a week in habitat management activities as part of their rehabilitation. Over the past ten years, Tees Valley Wildlife Trust have reached hundreds of people with this approach. In 2016 alone, over 50 volunteers were referred by a range of care organisations, agencies and individual carers across sectors and four local authority areas, as well as people who self-refer to improve their wellbeing.

The project now aims to reach anyone who is identified or identifies themselves as having a health and wellbeing need that causes barriers against them participating fully in society. The inclusive approach has built up Tees Valley's experience and expertise to work with people suffering from a range of short and long-term physical and mental health conditions including anxiety, depression, personality and delusional disorders and learning disabilities, as both prevention and intervention.

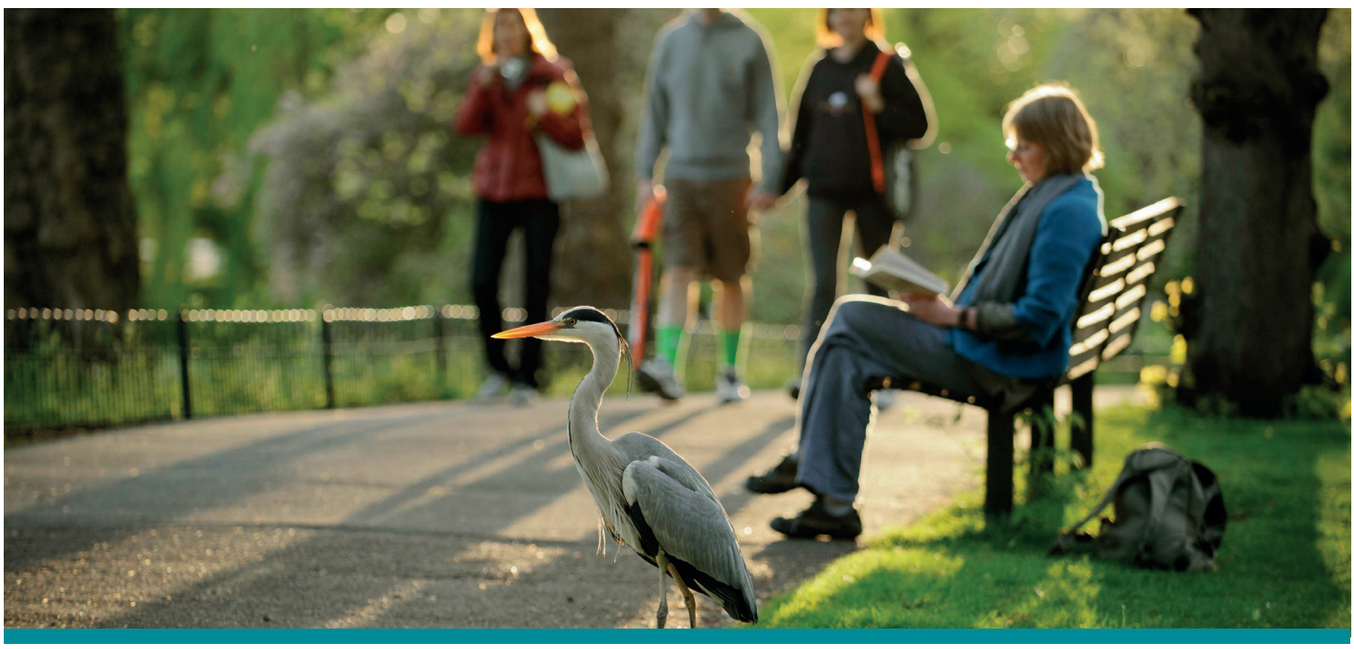
Most people attend one day per week, but those attending workshops come twice a week.
The participants are picked up on a minibus within 10 minutes of where they live and taken to one of our nature reserves and then they can take part in either a conservation task or a skills workshop.

The workshops are often user-led in that participants are often encouraged to come up with their own ideas and design items or take on particular roles. Activities now include workshops on woodwork, surveys, craft, activities, walks and events promoting the use of nature in health self-management, with conservation volunteering remaining a key activity, all designed to maximise the benefits from the five ways to wellbeing.

Many participants have reported improvements in relationships, the ability to deal with problems, and some moving from supported into independent accommodation. Some participants have received qualifications, taken on apprenticeships and have even returned to the workplace after long periods of sickness absence.

In addition to the health and wellbeing outcomes, significant improvements to Tees Valley green places, and new skills gained by participants leading to more independent, yet less isolated living. John Muir Awards have also been completed by many participants and have been instrumental in developing participants' confidence, esteem and relationships.

Recently, participants have started to fund their place through personal budgets either directly or via social care.



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6.2 Statistical analyses tables

Table 5. Statistical analysis for wellbeing

Analysis description	Test used	Test statistics
All 3 time-points, accounting for how long participants had been already attending before baseline measure (n = 35)	RM ANCOVA with how long participants had already been attending the Wildlife Trust projects at baseline entered as a covariate.	RM ANCOVA with how long participants had already been attending the Wildlife Trust projects at baseline entered as a covariate. Significant main effect for Time whilst controlling for covariate: $F_{2,66}$ = 13.46, p < 0.001 Significant Time by covariate interaction: $F_{2,66}$ = 5.27, p = 0.008
Comparison of Baseline to 6-weeks values (New starters n = 25; Existing attendees n = 32)	RM mixed ANOVA with attendee classification as a between-subjects variable (n = 57)	Significant main effect for Time from baseline to 6-weeks: $F_{1,55}$ = 21.41, p < 0.001 Significant Time by attendee classification interaction: $F_{1,55}$ = 10.75, p = 0.002
Comparison of Baseline to 12-weeks values (New starters n = 14; Existing attendees n = 28)	RM mixed ANOVA with attendee classification as a between-subjects variable (n = 42)	Significant main effect for Time from baseline to 6-weeks: $F_{1,40}$ = 31.79, p < 0.001 Significant Time by attendee classification interaction: $F_{1,40}$ = 18.15, p < 0.001

Table 6. Statistical analysis for feeling healthy

Analysis description	Test used	Test statistics
All 3 time-points, accounting for how long participants had been already attending before baseline measure (n = 34)	RM ANCOVA with how long participants had already been attending the Wildlife Trust projects at baseline entered as a covariate.	Significant main effect for Time whilst controlling for covariate: $F_{2,64}$ = 8.56, p = 0.001 Time by covariate interaction: $F_{2,66}$ = 2.59, p = 0.083 (not statistically significant)
Comparison of Baseline to 6-weeks values (New starters n = 25; Existing attendees n = 31)	RM mixed ANOVA with attendee classification as a between-subjects variable (n = 56)	Main effect for Time from baseline to 6-weeks: $F_{1,54}$ = 3.29, p = 0.075 (not statistically significant) Time by attendee classification interaction: $F_{1,54}$ = 2.04, p = 0.159 (not statistically significant)
Comparison of Baseline to 12-weeks values (New starters n = 14; Existing attendees n = 27)	RM mixed ANOVA with attendee classification as a between-subjects variable (n = 41)	Significant main effect for Time from baseline to 6-weeks: $F_{1,39}$ = 18.82, p < 0.001 Significant Time by attendee classification interaction: $F_{1,39}$ = 11.41, p = 0.002

Table 7. Statistical analysis for feeling positive

Analysis description	Test used	Test statistics
All 3 time-points, accounting for how long participants had been already attending before baseline measure (n = 33)	RM ANCOVA with how long participants had already been attending the Wildlife Trust projects at baseline entered as a covariate	Significant main effect for Time whilst controlling for covariate: $F_{2,62}$ = 20.44, p< 0.001 Significant time by covariate interaction: $F_{2,66}$ = 5.33, p = 0.007
Comparison of Baseline to 6-weeks values (New starters n = 25; Existing attendees n = 30)	RM mixed ANOVA with attendee classification as a between-subjects variable (n = 55)	Significant main effect for Time from baseline to 6-weeks: $F_{1,53}$ = 20.52, p < 0.001 Time by attendee classification interaction: $F_{1,53}$ = 2.99, p = 0.09 (not statistically significant)
Comparison of Baseline to 12-weeks values (New starters n = 14; Existing attendees n = 27)	RM mixed ANOVA with attendee classification as a between-subjects variable (n = 41)	Significant main effect for Time from baseline to 6-weeks: $F_{1,39}$ = 33.28, p < 0.001 Significant Time by attendee classification interaction: $F_{1,39}$ = 8.92, p = 0.005

Table 8. Statistical analysis for nature relatedness

Analysis description	Test used	Test statistics
All 3 time-points, accounting for how long participants had been already attending before baseline measure (n = 32)	RM ANCOVA with how long participants had already been attending the Wildlife Trust projects at baseline entered as a covariate	Significant main effect for Time whilst controlling for covariate: $F_{2,60}$ = 6.37, p = 0.003 Time by covariate interaction: $F_{2,60}$ = 2.14, p = 0.127 (not statistically significant)
Comparison of Baseline to 6-weeks values (New starters n = 25; Existing attendees n = 29)	RM mixed ANOVA with attendee classification as a between-subjects variable (n = 54)	Significant main effect for Time from baseline to 6-weeks: $F_{1,52}$ = 10.569 , p = 0.002 Time by attendee classification interaction: $F_{1,52}$ = 3.827, p = 0.056 (not statistically significant)
Comparison of Baseline to 12-weeks values (New starters n = 14; Existing attendees n = 27)	RM mixed ANOVA with attendee classification as a between-subjects variable (n = 41)	Significant main effect for Time from baseline to 6-weeks: $F_{1,39}$ =,10.84 p = 0.002 Significant Time by attendee classification interaction: $F_{1,39}$ = 6.58 , p = 0.014

Table 9. Statistical analysis for pro-environmental behaviours

Analysis description	Test used	Test statistics
All 3 time-points, accounting for how long participants had been already attending before baseline measure (n = 35)	RM ANCOVA with how long participants had already been attending the Wildlife Trust projects at baseline entered as a covariate	Significant main effect for Time whilst controlling for covariate: F2, 66= 9.62, p< 0.001 Time by covariate interaction: F2,66= 3.64, p= 0.032
Comparison of Baseline to 6-weeks values (New starters n= 20; Existing attendees n= 33)	RM mixed ANOVA with attendee classification as a between-subjects variable (n = 55)	Significant main effect for Time from baseline to 6-weeks: F1,51= 14.19, p< 0.001 Significant time by attendee classification interaction: F1,51= 4.23, p= 0.045
Comparison of Baseline to 12-weeks values (New starters n= 14; Existing attendees n= 27)	RM mixed ANOVA with attendee classification as a between-subjects variable (n = 41)	Significant main effect for Time from baseline to 6-weeks: F1,39= 17.44, p< 0.001 Significant Time by attendee classification interaction: F1,39= 10.98, p= 0.002

Table 10. Statistical analysis for physical activity

Analysis description	Test used	Test statistics
All 3 time-points, accounting for how long participants had been already attending before baseline measure (n = 35)	RM ANCOVA with how long participants had already been attending the Wildlife Trust projects at baseline entered as a covariate	Significant main effect for Time whilst controlling for covariate: $F_{2, 66}$ = 19.29 p < 0.001 Significant time by covariate interaction: $F_{2,66}$ = 5.12, p = 0.009
Comparison of Baseline to 6-weeks values (New starters n = 20; Existing attendees n = 33)	RM mixed ANOVA with attendee classification as a between-subjects variable (n = 53)	Significant main effect for Time from baseline to 6-weeks: $F_{1,51}$ = 8.46, p = 0.005 Significant time by attendee classification interaction: $F_{1,51}$ = 16.70, p < 0.001
Comparison of Baseline to 12-weeks values (New starters n = 14; Existing attendees n = 28)	RM mixed ANOVA with attendee classification as a between-subjects variable (n = 42)	Significant main effect for Time from baseline to 6-weeks: $F_{1,40}$ = 31.78, p < 0.001 Significant Time by attendee classification interaction: $F_{1,40}$ = 9.52, p = 0.004

Table 11. Statistical analysis for social engagement and support

Analysis description	Test used	Test statistics
All 3 time-points, accounting for how long participants had been already attending before baseline measure (n = 33)	RM ANCOVA with how long participants had already been attending the Wildlife Trust projects at baseline entered as a covariate	Main effect for Time whilst controlling for covariate: $F_{2,62}$ = 1.78, p = 0.178 (not statistically significant) Time by covariate interaction: $F_{2,62}$ = 1.13, p = 0.330 (not statistically significant)
Comparison of Baseline to 6-weeks values (New starters n = 25; Existing attendees n = 32)	RM mixed ANOVA with attendee classification as a between-subjects variable (n = 57)	Main effect for Time from baseline to 6-weeks: $F_{1,55}$ = 0.19, p = 0.669 (not statistically significant) Time by attendee classification interaction: $F_{1,55}$ = 0.35, p = 0.558 (not statistically significant)
Comparison of Baseline to 12-weeks values (New starters n = 14; Existing attendees n = 26)	RM mixed ANOVA with attendee classification as a between-subjects variable (n = 40)	Main effect for Time from baseline to 6-weeks: $F_{1,38}$ = 0.06, p = 0.812 (not statistically significant) Time by attendee classification interaction: $F_{1,38}$ = 0.06, p = 0.812 (not statistically significant)

Table 12. Statistical analysis for greenspace contact

Analysis description	Test used	Test statistics
All 3 time-points, accounting for how long participants had been already attending before baseline measure (n = 34)	RM ANCOVA with how long participants had already been attending the Wildlife Trust projects at baseline entered as a covariate	Significant main effect for Time whilst controlling for covariate: $F_{2,64}$ = 10.22, p = 0.002 Time by covariate interaction: $F_{2,64}$ = 2.69, p = 0.103 (not statistically significant)
	Friedman test*	$X2$ (2) = 11.52, p = 0.003
Test to assess how the proportion of participants who reported change in either direction for this measure	Wilcoxon ranked sign test* (n = 58)	Z = 2.73, p = 0.006
Test to assess how the proportion of participants who reported change in either direction for this measure	Wilcoxon ranked sign test* (n = 42)	Z = 3.03, p = 0.002

Table 13. Statistical analysis for rated importance of project-related aspects

Analysis description	Test used	Test statistics
All 3 time-points, accounting for how long participants had been already attending before baseline measure (n = 27)	RM ANCOVA with how long participants had already been attending the Wildlife Trust projects at baseline entered as a covariate	Multivariate significant main effect for time whilst controlling for covariate: $F_{14,90}$ = 2.57, p = 0.004 Multivariate significant time by covariate interaction: $F_{14,90}$ = 2.33, p = 0.009
Comparison of Baseline to 6-weeks values (New starters n = 21; Existing attendees n = 28)	RM mixed ANOVA with attendee classification as a between-subjects variable (n = 49)	Multivariate main effect for time from baseline to 6-weeks: $F_{7,41}$ = 0.94, p = 0.486 (not statistically significant) Multivariate significant time by attendee classification interaction: $F_{7,41}$ = 2.971, p = 0.013
Comparison of Baseline to 12-weeks values (New starters n = 12; Existing attendees n = 23)	Comparison of Baseline to 12-weeks values (New starters n = 12; Existing attendees n = 23)	Multivariate significant main effect for Time from baseline to 6-weeks: $F_{7,27}$ = 3.515, p = 0.008 Multivariate significant time by attendee classification interaction: $F_{7,27}$ = 3.864, p = 0.005

6.3 Questionnaires

Evaluation of Wildlife Trust activities

The University of Essex has been asked by The Wildlife Trusts to evaluate some of the activities they provide. As part of this evaluation, we will be asking you to complete a short questionnaire at regular time points throughout your involvement with your local Wildlife trust project to see if there have been any changes over time. We value your comments and would be most grateful if you could spare the time to complete our questionnaire. All the information given to us will be treated as anonymous and will not be passed on to a third party. More information about this evaluation can be found in the accompanying information sheet.

You do not have to answer the questions if you do not want to. If you can't answer a question just leave it and go onto the next question. When you have completed the questionnaire please hand it back to the person who gave it to you or post it to the freepost address at the end of the questionnaire.

Thank you!

Questionnaire A

Name of project: ☐ **Date:** ☐

1. I agree to take part in this research by completing questionnaires (please tick) ☐

2. Please read the following statements and tick the one that applies to you:

I am filling in the questionnaire about myself ☐

I am a project worker, helper or carer reading out the questions to the participant and filling in their responses ☐

3. Your gender? Male ☐ Female ☐ 4. Your Age?(In years) ☐

5. What best describes your main activity?

Employed	Unemployed	Retired	Unable to work	Carer	Student

6. So that we can match up your questionnaire responses from different time points, please write the first part of your postcode and the initials of your first name and surname in the boxes below:

Postcode ☐ First name initial ☐ Surname initial ☐

7. How long have you been coming to this project?
(e.g. you could write 5 weeks or 6 months or 3 years, depending on how long it has been) ☐

8. How often do you take part in these activities?

Daily	☐	Once a month	☐
2-3 times a week	☐	Once every 6 months	☐
Once a week	☐	Once a year or less	☐
Once a fortnight	☐	This is a one-off	☐

9. How much contact do you normally have with nature and greenspace?
(e.g. going to the park, woods, countryside, beach etc)

Daily	☐	Once a month	☐
2-3 times a week	☐	Once every 6 months	☐
Once a week	☐	Once a year or less	☐
Once a fortnight	☐	None, I have never had the opportunity before	☐

10. In the past week, on how many days have you done a total of 30 minutes or more of physical activity which was enough to raise your breathing rate? This may include sport, exercise, brisk walking, cycling or gardening for recreation or to get to and from places.

0 ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 ☐

The following sections of the questionnaire contain questions about how you feel about yourself, other people and nature. They are made up of standardised questions so some of the words and phrases are written in different styles. Please ask if you need any help. There are no right or wrong answers, so please just answer honestly by ticking the relevant box for each question.

11. Below are some statements about feelings and thoughts. Please tick the box that best describes your experience of each over the last 2 weeks

Statements	None of the time	Rarely	Some of the time	Often	All of the time
I've been feeling optimistic about the future					
I've been feeling useful					
I've been feeling relaxed					
I've been feeling interested in other people					
I've had energy to spare					
I've been dealing with problems well					
I've been thinking clearly					
I've been feeling good about myself					
I've been feeling close to other people					
I've been feeling confident					
I've been able to make up my own mind about things					
I've been feeling loved					
I've been interested in new things					
I've been feeling cheerful					

Warwick-Edinburgh Mental Well-Being Scale (SWEMWBS) © NHS Health Scotland, University of Warwick and University of Edinburgh, 2009, all rights reserved.

12. On a scale of 1 – 10, how healthy do you feel at the moment?
(please circle one number only)

Not at all healthy	1	2	3	4	5	6	7	8	9	10	Very healthy

13. On a scale of 1 – 10, how positive do you feel at the moment?
(Please circle one number only)

Not at all positive	1	2	3	4	5	6	7	8	9	10	Very positive

14. Please tell us how much you agree with the following statements by ticking the appropriate box for each one

	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
There are people in my life who really care about me					
I regularly meet socially with friends and relatives					
I find it difficult to meet with people who share my hobbies or interests					

15. For each of the following, please rate the extent to which you agree with each statement, using the scale from 1 to 5 as shown below. Please respond as you really feel, rather than how you think "most people" feel.

Statements	Disagree strongly	Disagree a little	Neither agree or disagree	Agree a little	Agree strongly
My ideal vacation spot would be a remote, wilderness area.					
I always think about how my actions affect the environment.					
My connection to nature and the environment is a part of my spirituality.					
I take notice of wildlife wherever I am.					
My relationship to nature is an important part of who I am.					
I feel very connected to all living things and the earth					

Nisbet and Zelenski 2013.

16. Please put a cross somewhere on the line to tell us how important you find each of the following:



17. How often do you do the following?

	Always	Often	Some-times	Rarely	Never
Recycle glass, paper and metal					
Use energy saving light bulbs					
Turn off power at the plug on appliances when not in use					
Turn off the tap whilst brushing your teeth					
Buy organic or local food					
Prefer to walk, cycle or use public transport rather than drive short distances					
Put out food for birds or other wildlife					

18. Any further comments?

Questionnaire B

Name of project: **Date:**

1. I agree to take part in this research by completing questionnaires (please tick)

2. Please read the following statements and tick the one that applies to you:

I am filling in the questionnaire about myself

I am a project worker, helper or carer reading out the questions to the participant and filling in their responses

3. Your gender? Male Female 4. Your Age?(In years)

4. What best describes your main activity?

Employed	Unemployed	Retired	Unable to work	Carer	Student

5. So that we can match up your questionnaire responses from different time points, please write the first part of your postcode and the initials of your first name and surname in the boxes below:

Postcode First name initial Surname initial

6. How long have you been coming to this project?
(e.g. you could write 5 weeks or 6 months or 3 years, depending on how long it has been)

7. How often do you take part in these activities?

Daily		Once a month	
2-3 times a week		Once every 6 months	
Once a week		Once a year or less	
Once a fortnight		This is a one-off	

8. How much contact do you normally have with nature and greenspace?
(e.g. going to the park, woods, countryside, beach etc)

Daily		Once a month	
2-3 times a week		Once every 6 months	
Once a week		Once a year or less	
Once a fortnight		None, I have never had the opportunity before	

9. In the past week, on how many days have you done a total of 30 minutes or more of physical activity which was enough to raise your breathing rate? This may include sport, exercise, brisk walking, cycling or gardening for recreation or to get to and from places.

0 1 2 3 4 5 6 7

The following sections of the questionnaire contain questions about how you feel about yourself, other people and nature. They are made up of standardised questions so some of the words and phrases are written in different styles. Please ask if you need any help. There are no right or wrong answers, so please just answer honestly by ticking the relevant box for each question.

10. Below are some statements about feelings and thoughts. Please tick the box that best describes your experience of each over the last 2 weeks

Statements	None of the time	Rarely	Some of the time	Often	All of the time
I've been feeling optimistic about the future					
I've been feeling useful					
I've been feeling relaxed					
I've been feeling interested in other people					
I've had energy to spare					
I've been dealing with problems well					
I've been thinking clearly					
I've been feeling good about myself					
I've been feeling close to other people					
I've been feeling confident					
I've been able to make up my own mind about things					
I've been feeling loved					
I've been interested in new things					
I've been feeling cheerful					

Warwick-Edinburgh Mental Well-Being Scale (SWEMWBS) © NHS Health Scotland, University of Warwick and University of Edinburgh, 2009, all rights reserved.

11. On a scale of 1 – 10, how healthy do you feel at the moment?
(Please circle one number only)

Not at all healthy | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | Very healthy

12. On a scale of 1 – 10, how positive do you feel at the moment?
(Please circle one number only)

Not at all positive | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | Very positive

13. Please tell us how much you agree with the following statements by ticking the appropriate box for each one

	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
There are people in my life who really care about me					
I regularly meet socially with friends and relatives					
I find it difficult to meet with people who share my hobbies or interests					

14. For each of the following, please rate the extent to which you agree with each statement, using the scale from 1 to 5 as shown below. Please respond as you really feel, rather than how you think "most people" feel.

Statements	Disagree strongly	Disagree a little	Neither agree or disagree	Agree a little	Agree strongly
My ideal vacation spot would be a remote, wilderness area.					
I always think about how my actions affect the environment.					
My connection to nature and the environment is a part of my spirituality.					
I take notice of wildlife wherever I am.					
My relationship to nature is an important part of who I am.					
I feel very connected to all living things and the earth					

Nisbet and Zelenski 2013.

15. Has participating in this project changed how you feel about yourself and if so, how?

16. Please put a cross somewhere on the line to tell us how important you find each of the following:



17. How often do you do the following?

	Always	Often	Some-times	Rarely	Never
Recycle glass, paper and metal					
Use energy saving light bulbs					
Turn off power at the plug on appliances when not in use					
Turn off the tap whilst brushing your teeth					
Buy organic or local food					
Prefer to walk, cycle or use public transport rather than drive short distances					
Put out food for birds or other wildlife					

18. Has participating in this project changed how you feel about nature and if so, how?

19. Has participating in this project changed how you feel about other people and if so, how?

That's all! Thank you very much for sparing the time to complete our questionnaires.

Please hand the questionnaire back to the person that gave it to you or alternatively send freepost to:

Freepost RSSR-TZLH-UUSG
Rachel Bragg ICES
Department of Biological Sciences
University of Essex
Wivenhoe Park
COLCHESTER
CO4 3SQ

If you have any questions about this research please contact the key researcher Mike Rogerson, by email: mike.rogerson@essex.ac.uk

The Wildlife Trusts: The Kiln, Mather Road, Newark, NG24 1WT
Visit us online: www.wildlifetrusts.org

University of Essex: Wivenhoe Park, Colchester CO4 3SQ
Visit us online: www.essex.ac.uk

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