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Participation in environmental enhancement and conservation activities for health and well-being in adults: a review of quantitative and qualitative evidence (Review)

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[Intervention Review]

Participation in environmental enhancement and conservation activities for health and well-being in adults: a review of quantitative and qualitative evidence

Kerryn Husk[1], Rebecca Lovell[2], Chris Cooper[3], Will Stahl-Timmins[2], Ruth Garside[2]

[1]NIHR CLAHRC South West Peninsula (PenCLAHRC), Plymouth University Peninsula Schools of Medicine and Dentistry, Plymouth, UK. [2]European Centre for Environment and Human Health, University of Exeter Medical School, University of Exeter, Truro, UK. [3]Institute of Health Research, University of Exeter Medical School, University of Exeter, Exeter, UK

Contact address: Ruth Garside, European Centre for Environment and Human Health, University of Exeter Medical School, University of Exeter, Knowledge Spa, Royal Cornwall Hospital, Truro, Cornwall, UK. R.Garside@exeter.ac.uk.

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ABSTRACT

Background

There is growing research and policy interest in the potential for using the natural environment to enhance human health and well-being. This resource may be underused as a health promotion tool to address the increasing burden of common health problems such as increased chronic diseases and mental health concerns. Outdoor environmental enhancement and conservation activities (EECA) (for instance unpaid litter picking, tree planting or path maintenance) offer opportunities for physical activity alongside greater connectedness with local environments, enhanced social connections within communities and improved self-esteem through activities that improve the locality which may, in turn, further improve well-being.

Objectives

To assess the health and well-being impacts on adults following participation in environmental enhancement and conservation activities.

Search methods

We contacted or searched the websites of more than 250 EECA organisations to identify grey literature. Resource limitations meant the majority of the websites were from UK, USA, Canada and Australia. We searched the following databases (initially in October 2012, updated October 2014, except CAB Direct, OpenGrey, SPORTDiscus, and TRIP Database), using a search strategy developed with our project advisory groups (predominantly leaders of EECA-type activities and methodological experts): ASSIA; BIOSIS; British Education Index; British Nursing Index; CAB Abstracts; Campbell Collaboration; Cochrane Public Health Specialized Register; DOPHER; EMBASE; ERIC; Global Health; GreenFILE; HMIC; MEDLINE-in-Process; MEDLINE; OpenGrey; PsychINFO; Social Policy and Practice; SPORTDiscus; TRoPHI; Social Services Abstracts; Sociological Abstracts; *The Cochrane Library*; TRIP database; and Web of Science. Citation and related article chasing was used. Searches were limited to studies in English published after 1990.

Selection criteria

Two review authors independently screened studies. Included studies examined the impact of EECA on adult health and well-being. Eligible interventions needed to include each of the following: intended to improve the outdoor natural or built environment at either a local or wider level; took place in urban or rural locations in any country; involved active participation; and were NOT experienced through paid employment.

We included quantitative and qualitative research. Includable quantitative study designs were: randomised controlled trials (RCTs), cluster RCTs, quasi-RCTs, cluster quasi-RCTs, controlled before-and-after studies, interrupted-time-series, cohort studies (prospective or retrospective), case-control studies and uncontrolled before-and-after studies (uBA). We included qualitative research if it used recognised qualitative methods of data collection and analysis.

Data collection and analysis

One reviewer extracted data, and another reviewer checked the data. Two review authors independently appraised study quality using the Effective Public Health Practice Project tool (for quantitative studies) or Wallace criteria (for qualitative studies). Heterogeneity of outcome measures and poor reporting of intervention specifics prevented meta-analysis so we synthesised the results narratively. We synthesised qualitative research findings using thematic analysis.

Main results

Database searches identified 21,420 records, with 21,304 excluded at title/abstract. Grey literature searches identified 211 records. We screened 327 full-text articles from which we included 21 studies (reported in 28 publications): two case-studies (which were not included in the synthesis due to inadequate robustness), one case-control, one retrospective cohort, five uBA, three mixed-method (uBA, qualitative), and nine qualitative studies. The 19 studies included in the synthesis detailed the impacts to a total of 3,603 participants: 647 from quantitative intervention studies and 2630 from a retrospective cohort study; and 326 from qualitative studies (one not reporting sample size).

Included studies shared the key elements of EECA defined above, but the range of activities varied considerably. Quantitative evaluation methods were heterogeneous. The designs or reporting of quantitative studies, or both, were rated as 'weak' quality with high risk of bias due to one or more of the following: inadequate study design, intervention detail, participant selection, outcome reporting and blinding.

Participants' characteristics were poorly reported; eight studies did not report gender or age and none reported socio-economic status. Three quantitative studies reported that participants were referred through health or social services, or due to mental ill health (five quantitative studies), however participants' engagement routes were often not clear.

Whilst the majority of quantitative studies (n = 8) reported no effect on one or more outcomes, positive effects were reported in six quantitative studies relating to short-term physiological, mental/emotional health, and quality-of-life outcomes. Negative effects were reported in two quantitative studies; one study reported higher levels of anxiety amongst participants, another reported increased mental health stress.

The design or reporting, or both, of the qualitative studies was rated as good in three studies or poor in nine; mainly due to missing detail about participants, methods and interventions. Included qualitative evidence provided rich data about the experience of participation. Thematic analysis identified eight themes supported by at least one good quality study, regarding participants' positive experiences and related to personal/social identity, physical activity, developing knowledge, spirituality, benefits of place, personal achievement, psychological benefits and social contact. There was one report of negative experiences.

Authors' conclusions

There is little quantitative evidence of positive or negative health and well-being benefits from participating in EECA. However, the qualitative research showed high levels of perceived benefit among participants. Quantitative evidence resulted from study designs with high risk of bias, qualitative evidence lacked reporting detail. The majority of included studies were programme evaluations, conducted internally or funded by the provider.

The conceptual framework illustrates the range of interlinked mechanisms through which people believe they potentially achieve health and well-being benefits, such as opportunities for social contact. It also considers potential moderators and mediators of effect.

One main finding of the review is the inherent difficulty associated with generating robust evidence of effectiveness for complex interventions. We developed the conceptual framework to illustrate how people believed they benefited. Investigating such mechanisms in a subsequent theory-led review might be one way of examining evidence of effect for these activities.

The conceptual framework needs further refinement through linked reviews and more reliable evidence. Future research should use more robust study designs and report key intervention and participant detail.

PLAIN LANGUAGE SUMMARY

Participation in environmental enhancement and conservation activities for health and well-being in adults

Background: This is the report from a systematic review examining if taking part in activities that enhance the natural environment (such as maintaining paths to access the countryside) can improve people's physical and mental health. A systematic review is a research method to identify, quality appraise and synthesise all relevant evidence about a particular topic.

It is thought that contact with the natural environment has a positive impact on health and well-being. For example, those living closer to green spaces have better mental health than those who don't. Parks and countryside may also provide a place for healthy activities which can improve physical health. There is interest in understanding whether the natural environment can be a resource to improve public health.

Methods: We wanted to know if taking part in nature conservation, or other activities that enhance the environment (such as litter-picking), can impact on health. The activities examined aimed to improve the outdoor environment in urban or rural locations. Participants were adult volunteers or were referred by a healthcare professional.

We conducted a systematic review. We searched databases and contacted experts to identify all relevant academic and unpublished research (grey literature) from any country.

Results: We found 19 studies based on numerical data (quantitative) and text from interviews (qualitative). They came from the UK, US, Canada and Australia.

The majority of quantitative studies reported no effect on health and well-being. There was limited evidence that participation had positive effects on self-reported health, quality of life and physical activity levels. Some also reported increased mental fatigue and greater feelings of anxiety.

The qualitative studies illustrate the experiences of people taking part, and their perceptions of the benefits. People reported feeling better. They liked the opportunity for increased social contact, especially if they had been socially isolated through, for example, mental ill-health. They also valued a sense of achievement, being in nature and provision of a daily structure.

Limitations: The results need to be treated with caution because the research methods used were not very robust and cannot show definitively that participation caused any health change. The quality of the research, in terms of study design and reporting, was low.

Conclusions: Given the quality of the evidence, we cannot draw any definite conclusions. More reliable research is needed to understand exactly how and why these activities may benefit health, and to assess whether they could be used as an effective health promotion tool.

BACKGROUND

Description of the condition

There is growing research and policy interest in the potential of using the natural environment to enhance human health and well-being (Capaldi 2014; Defra 2011; RSPB 2004). This is coupled with an increasing interest in the role of health in the context of global environmental agreements (Horwitz 2012; Patz 2012). Undertaking environmental enhancement or conservation activities has been suggested as being beneficial for a wide range of population groups, including individuals with mental ill health (Gonzalez 2014; Hunter 2015; Mind 2007; O'Brien 2011; Whear 2014), children (Hermann 2006), adults (Evans 2008; Hale 2011; Moore 2006; O'Brien 2010a; O'Brien 2011; Pretty 2007; Townsend 2006), and older adults (Bushway 2011; Pillemer 2010; Raske 2010).

Research has suggested that participation in environmental enhancement activities may have positive effects on physical and mental health and well-being. It has been suggested that these benefits may be brought about not only through increased opportunities for physical activity, but also through contact with the natural world, engagement in meaningful activities and the potential for enhanced social connections (O'Brien 2011; Sempik 2010; Van den Berg 2015).

This review assesses the quantitative and qualitative evidence for health and well-being impacts in adults following participation in environmental enhancement and conservation activities.

Description of the intervention

Environmental enhancement or conservation activities (EECA) are those which fulfil all of the following:

- are intended to improve the outdoor natural or built environment at either a local or wider level;
- take place in urban or rural locations;
- involve active participation;
- can be entirely voluntary, or not (such as through offenders doing Community Service); and
- are NOT experienced through paid employment.

Mutuality is often central: activities aim to benefit all - human, non-human and the environment in which the activity takes place (Burls 2007). In contrast to sustainability activities (individual reduction in fuel use etc.), these activities have a physical, outdoor element, and thus potentially impact on participants' immediate health and well-being.

Specific activities may therefore include:

- watershed restoration;
- path maintenance;
- habitat enhancement or restoration;
- litter picking; or
- re-greening of urban waste sites.

Some EECAs are undertaken though specific programmes such as 'Green Gym' or 'Landcare'.

The spaces in which the enhancement activities may take place include:

- communal green spaces;
- parks and other natural areas in urban or rural environments;
- streets; or
- school, hospital or other institutional grounds.

Activities which do not result in physical environmental change (e.g. citizen science or surveying) or which are undertaken in private (e.g. domestic gardening) were excluded, as were certain activities which shared some characteristics of EECA, because they are considered elsewhere. Excluded activities included:

- domestic gardening;
- community or allotment gardening;
- care or therapeutic gardening;
- community farming; or
- environmental surveying.

How the intervention might work

Various theoretical hypotheses have been proposed to explain how participation in environmental enhancement and conservation activities may impact on health and well-being. Multiple pathways have been suggested, for example through opportunities for increased physical activity, stress relief, enhanced social contact and engagement, or through improved living environments. The review considers academic alongside 'everyday' practitioner and participant theories.

Physical activity has been shown to impact on health-related quality of life (Bize 2007); it may therefore be a key mechanism through which people benefit from environmental enhancement activities (Maas 2008). Additional benefits may accrue through the environment in which the activity takes place, for example it has been argued that physical activity in a natural environment is of greater benefit than that which takes place indoors (Haubenhofer 2010; Peacock 2007; Thompson Coon 2011). Outdoor environments offer greater topographical variation which may promote broader physiological benefits (Plante 2007).

Environmental enhancement and conservation activities, when undertaken in a group or within a community, have the potential to confer benefit through increased social connectivity, and enhancing local environments (Burls 2005). Self-esteem may be enhanced through engagement with valued activities to improve the locality. This may in turn further improve well-being (Sempik 2010), though may also perpetuate health inequalities. While it is recognised that not all environmental enhancement activities are voluntary (for example, those undertaken as community service), the act of volunteering to undertake meaningful activities, with clear and defined benefits, may have further positive impacts on health, specifically mental well-being (Musick 2003).

Satisfaction (when considering factors such as the presence of pleasant green spaces, litter or general state of repair) with one's living environment has been linked to well-being (Herzele 2012). It is hypothesised that activities undertaken to enhance one's living environment, whether urban or rural, may therefore result in improvements to health and well-being (Maller 2009).

A group of academic theories, primarily from psychological and biological literature, suggest that human beings have an innate evolutionary connection to the natural world and that contact may be of benefit to health and well-being, or 'biophilia' (Wilson 1984). These connections have repeatedly been argued to reduce both mental fatigue and levels of stress (Kaplan 1989; Ulrich 1991). Given the increasing urbanisation of the social world and the declining contact with natural environments (Beatley 2011; Lee 2011), arguments have been forwarded citing the potential harm

inherent in this separation (RSPB 2004). Attention restoration theory and psychophysiological theories suggest that the natural environment is effective in promoting recovery from fatigue and stress (both direct and indirect) (RSPB 2004). However, whilst popular, there is increasing critique of these theories (Joye 2011). We convened a group of practitioners involved in environmental conservation activities to form a Project Reference Group (PRG) for this review (see Appendix 1). Through workshops with the review team, they helped to articulate the everyday theories of intervention effect, used to justify and support policy and practice, associated with encouraging people to undertake environmental enhancement activities to improve their health and well-being (described in more detail in the Discussion).

Why it is important to do this review

Increasingly, public health concern is focused on rising levels of chronic disease, lifestyle conditions such as obesity and heart disease, and mental health conditions such as depression (Maller 2005a). Preventative activities and treatments that avoid or reduce pharmaceutical use are appealing in terms of potential benefits to individuals and cost savings to healthcare systems (Mind 2007). Activities that contribute to a healthy lifestyle, such as increased physical activity, have the potential to accrue multiple health and well-being benefits. The potential for interventions that involve active use of the outdoor environment as a setting to improve mental and physical health and well-being needs to be examined. We were unable to find any existing systematic reviews which specifically focused on health and well-being outcomes of participation in environmental enhancement activities. Previous reviews in this field have arguably lacked methodological rigour (Bowler 2009), or focused on a restricted evidence base on an associated topic (NICE 2006). The latter included only controlled study designs, specifically focused on enhancement of the natural environment, and only considered physical activity levels as an outcome of the changed environment, rather than of involvement in the changes themselves. Additionally, NICE 2006 was conducted eight years prior to this review and there has been growing research activity in this area since then. Our approach addresses these issues and provides a more comprehensive assessment of the evidence base.

OBJECTIVES

To assess the health and well-being impacts on adults following participation in environmental enhancement and conservation activities.

METHODS

Criteria for considering studies for this review

Types of studies

Quantitative studies

Only studies reporting primary data were included.
Quantitative study designs eligible for the main analysis were:

- randomised controlled trials (RCTs), cluster RCTs;
- quasi-RCTs, cluster quasi-RCTs;
- controlled before-and-after studies with any appropriate comparator groups;
- interrupted time series;
- cohort studies (prospective or retrospective); and
- case-control studies.

We included data from case-control studies which reported cases and controls whose comparability on relevant baseline characteristics and potential confounders could be judged, and which comprehensively reported confounders.
We included data from cohort studies which occurred over a reasonable timescale (T $\geq$ 6 months) and which accurately recorded drop-out figures/characteristics.
There was a dearth of controlled evidence identified so, in line with the protocol, we also included uncontrolled before-and-after studies. A similar approach has been used previously in a Cochrane review examining rural hospital settings (Gruen 2004).
Definitions of included study designs are shown in Appendix 2.

Qualitative Studies

We included qualitative studies in the review to illuminate the participant experience and understand how people felt they benefited from participation, as well as to inform the conceptual framework. Qualitative studies from any discipline or theoretical tradition that used recognised qualitative methods of data collection and analysis (Munro 2007) were eligible for inclusion. Recognised data collection methods included focus groups, individual interviews, ethnographic interviews and participant observation. Recognised methods of analysis included narrative analysis, thematic analysis, grounded theory, phenomenological approaches and discourse analysis.

Types of participants

Quantitative and qualitative studies

We included studies of adults (aged $\geq$ 18 years).

Types of interventions

Quantitative and qualitative studies

Outdoor, physically active environmental enhancement and conservation (EECA) (as defined above and for more detail see below) activities were included in the review. Participation in EECA was intended to improve the outdoor environment and may occur in built or natural, urban or rural areas.

In studies where participants engaged in a range of activities, and only some participants undertook environmental enhancement, we included only those studies where data was reported separately for those participating in environmental enhancement. Studies where participants engaged in a mixture of activities (for example, all participating in activities which included urban greening activities but also some art production) were included when the major activity and focus related to environmental enhancement. If reported numerically, this was more than 50%. If not reported numerically, a qualitative judgement was made by the review team.

We included studies of voluntary or non-voluntary participation. While in most cases participation was purely voluntary (e.g. volunteer groups), there were also those for whom participation was non-voluntary, or at least represented a constrained choice, such as offenders doing community service and referral schemes.

We excluded studies focusing on adults who undertook environmental enhancement activities as part of formal employment, such as park wardens or tree surgeons. Where studies included both employed and non-employed participation we only extracted data referring to non-employed participants.

Includable activities which are intended to improve the natural environment are listed below (the list is not exhaustive):

- litter picking;
- re-greening of built environments;
- tree planting and woodland creation;
- hedge building;
- pathway creation;
- watershed restoration;
- habitat restoration;
- landcare;
- community garden creation (but not use or maintenance);
- forestry or woodland management; or
- decontamination/clearing of communal green space.

Undertaken in areas such as:

- communal green spaces (whether urban or rural);
- built spaces including urban streets;
- communal natural features within public urban built environments;
- public parks;
- school, hospital or other institutional grounds;
- beaches;
- public footpaths;
- wilderness spaces; or
- woodlands and forests.

Activities which were excluded from this review included:

- domestic gardening;
- community or allotment gardening;
- care or therapeutic gardening;
- community farming; or
- environmental surveying.

Private activities which took place in private environments (e.g. domestic gardening) were excluded. We excluded activities such as horticultural therapy, community farming and domestic gardening because the aims, motivations and outcomes may differ from those of environmental enhancement (as defined above). We feel that these activities constitute separate review topics and are outside the scope of this systematic review.

Appropriate comparator activities included non-conservation-based physical activities and volunteering in non-conservation activities.

The Expert Advisory Group (academics) and the Project Reference Group helped refine the definition of the activities for inclusion (Appendix 1).

Types of outcome measures

Quantitative research

To be included, studies had to report one of the following measures of health or well-being, whether physical or mental (including emotional and quality of life), assessed using self-report or objective measures:

- physiological measures (for example, heart rate, cortisol levels, percentage of body fat or body mass index);
- physical health measures, general or specific (for example measures of self-reported health status, measures of general function and capacity);
- mental and emotional health outcomes (including validated scales such as the Warwick-Edinburgh Mental Well-being Scale (WEMWBS) (http://www.healthscotland.com/documents/1467.aspx) or measures of emotional response, measures of attention restoration/stress recovery); or
- quality-of-life measures (e.g. The 36-Item Short Form Health Survey (SF-36) (http://www.sf-36.org/), The EuroQoL 'EQ-5D' instrument).

We also extracted the following outcomes where studies reported at least one of the above:

- physical activity behaviours (for example, frequency, pattern and intensity of activity, physical activity beliefs and intentions);
- cognitive performance;
- rate of recovery from illness or disability (physical or mental);

- recording of positive feelings, whether the participant enjoyed/liked the experience;
- data on outcomes related to social cohesion (e.g. UK Citizenship Survey 2009-10 cohesion measures (Dept for Communities and Local Government 2013)) where reported;
- measures of increased knowledge about the environment or related educational qualifications gained; or
- measures of changes in community or volunteering participation.

Adverse or unintended consequences:
- injury; or
- allergenic reaction in response to exposure to environmental triggers (e.g. pollen).

We excluded studies which focused solely on the benefits to the environment, that is, outcomes related environmental quality but did not report health outcomes, following environmental enhancement activities.

Qualitative research findings

For inclusion, the findings of qualitative studies had to relate to the perceived health and well-being impacts, positive or negative, reported by those participating in environmental enhancement activities. We extracted data in the form of key themes, concepts, quotes and metaphors about the impact of participation.

Search methods for identification of studies

An information Specialist (CC) led search methods. Locating evidence for this review drew upon a variety of search methods, reflecting the diffuse nature of the literature base in this topic, and the difficulties in locating relevant evidence from across the environmental health and conservation fields (Pullin 2001).
Given the noted heterogeneity of the literature base (Fazey 2004), with items spread between a variety of mixed topical databases, items which have not been formally published, or not published at all, the review required an innovative search approach. We drew upon the standard systematic approaches of electronic bibliographic searching, citation chasing, web-searching, grey-literature searching and expert contact.

Electronic searches

The review team and Information Specialist extensively discussed and tested the bibliographic search syntax before sending it to the convened Project Reference Group for additional comments (Appendix 1). In October 2012 we searched the following databases, with updated searches conducted in October 2014 (except CAB Abstracts, OpenGrey, SPORTDiscus, and TRIP Database, as subscriptions for the University of Exeter had lapsed):
- Assia (ProQuest);
- BIOSIS (ISI);
- British Education Index (ProQuest);
- British Nursing Index (ProQuest);
- CAB Abstracts (CAB Direct);
- Campbell Collaboration;
- Cochrane Public Health Specialized Register;
- DOPHER (EPPI);
- EMBASE (Ovid);
- ERIC (ProQuest);
- Global Health (Ovid);
- GreenFILE (EBSCO);
- HMIC (Ovid);
- MEDLINE in Process (Ovid);
- MEDLINE (Ovid);
- OpenGrey;
- PsychINFO (Ovid);
- Social Policy and Practice (Ovid);
- SPORTDiscus ;
- TRoPHI (EPPI);
- Social Services Abstracts (ProQuest);
- Sociological Abstracts (ProQuest);
- The Cochrane Library;
- TRIP Database; and
- Web of Science (including conference citations index) (ISI).

The search strategy terms used and exact dates of searches are available in Appendix 3. We used only intervention terms in the strategy and used the search to identify both quantitative and qualitative evidence. The populations included were necessarily broad and we could not include terms to narrow the field. Similarly, included study designs prevented reduction by comparator group, as evidence was likely to exist which had single group samples. Grey literature and scoping searches had also highlighted the disparity in outcome labelling in this field, which prohibited the inclusion of outcome terms in the strategy.
A year limit was applied, 1990-current (last searches performed October 2014), which is the period in which environmental enhancement activities became widely recognised (the Green Gym project was developed in the late 1990s) and health impact research emerged.
We did not limit our searches by country however we only included papers in English. While we recognise that there is a potential for bias to be introduced as a result of limiting the searches to English, the direction and degree of such bias is unknown. As outlined in the *Cochrane Handbook for Systematic Reviews of Interventions* (Sterne 2011), there is conflicting evidence about the potential bias introduced by an English language limit: Juni 2002 reported that non-English trials were more likely to report significant results, whilst Moher 2003 reported no significant difference in meta-analyses which excluded trials in languages other than English.

Searching other resources

Given the difficulties in locating relevant evidence, our bibliographic searching formed only one arm of our search strategy for this review. We began with a scoping stage of expert/stakeholder contact searching using web-resources and speaking with organisations of relevance to identify unique or unpublished items (these organisations can be found in Appendix 4). Items identified at this stage were entered into Endnote 2011.

Pragmatically, our search for grey literature focused on UK organisations, who were contacted by telephone, and further contacts identified through snowballing, where existing contacts provided details of others. The requirement to discuss the project aims with contacts alongside the quantity of organisations in the field could not, realistically, be repeated globally. However we included evidence from non-UK/European English-speaking countries as far as possible, and searched international websites.

Secondly, and again in development with the Project Reference Group, handsearching was conducted on the websites of relevant organisations, including non-UK/European English-speaking countries, a list of organisations identified can be found in Appendix 5. We searched the sites using selected terms (see Appendix 5) entered into website search boxes and a manual trawl of the first 100 results. If the first 100 results yielded a high level of includable items (i.e. > 10%) then more hits were trawled. For websites where searches with a single term resulted in an excessive number of hits (for example the American Environmental Protection Agency (EPA)), terms were combined to return only relevant items. Sites where only a small number of publications were listed were trawled in full. We then downloaded items or requested them via email. Our website searches included extensive searching of non-UK/European English-speaking countries. We asked the Project Reference Group to identify key international organisations and we contacted them or searched their websites for relevant unpublished reports.

Papers identified using these non-database methods were readily available as full texts (many without abstracts), so higher numbers were screened at the full-text stage than is usual.

We followed the above search methods with forwards and backwards citation chasing on included items, and related article searches on any items identified.

We shared the list of includable studies with the Project Reference Group and known academics in the field to seek further references.

Grey literature searching was also conducted through bibliographic databases (such as Social Policy and Practice, www.spandp.net), we also web-searched known portals (e.g. Open Grey, www.opengrey.eu) in addition to library catalogues, such as the British Library (www.bl.uk). Google (www.google.com) was also searched.

As with the citation and related article chasing used in the first step, we chased every includable item to locate further information. This was important given the variety of places relevant literature was stored.

We also used citation alerts on included items, as there is a delay between acceptance and publication in the conservation literature (Fazey 2004; Kareiva 2002).

Data collection and analysis

Selection of studies

The files containing the exported results of the searches were uploaded and de-duplicated in Endnote 2011. Where an export was not possible, for example from a resource without reference manager (RIS) functionality, we exported and saved data to a word file (e.g. .doc). We recorded the searches using the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines (Moher 2009).

We undertook study selection in two phases. Firstly, two team members (KH and RL) independently screened titles, and, where available, abstracts of any identified studies. Where these appeared to meet the inclusion criteria, we obtained the full text and two review authors independently screened them. Where there was disagreement, the researchers discussed the study and came to an agreement, or a third researcher (RG) was brought in to aid consensus.

Data extraction and management

We extracted data into bespoke data extraction forms (different for quantitative and qualitative research) developed for the review. One reviewer extracted data and these were checked by another (KH and RL). One author (KH) entered the final agreed data extraction into the Cochrane Collaboration's statistical software, Review Manager version 5.3 (RevMan) RevMan 2014.

For all studies, we extracted: full details of the nature of the intervention (content, time frame of activity and frequency of engagement) and any theory informing it; setting and provider; and the type, quality and features of the environment in which the activity was undertaken. We also extracted data, where available, referring to the level of participation and frequency of exposure to the intervention. Where possible, we collected data on the settings in which the activity took place, providing context for the results. We extracted equity data where study authors reported on any of the PROGRESS-Plus factors, a framework to ensure reporting encompasses an equity lens (ONeill 2014). We did not extract the resources and costs of interventions.

Data extracted specifically from quantitative research included: sample characteristics of the included population, methods and results of outcomes measured (for a list of included outcomes see 'Types of outcome measures' section above). For study designs with pre- and post-measures, we extracted time-point details alongside the outcomes.

For included qualitative research, we extracted relevant themes, concepts and quotes, together with details of the sample and study

methodology. We extracted all relevant findings, including data referring to all the pathways to impacts and the experience participants reported of programmes.

Assessment of risk of bias in included studies

Quantitative studies

We did not locate any randomised studies for this review, and therefore did not use the Cochrane tool for assessing risk of bias (Higgins 2011). We appraised quantitative studies using the Effective Public Health Practice Project (EPHPP) criteria for potential sources of bias (Armijo-Olivo 2012) (see Appendix 6). Cochrane Public Health recommends the EPHPP tool as suitable for systematic reviews of effectiveness (Armstrong 2007). The tool assesses studies based on selection bias, study design, confounders, blinding, data collection methods (where outcomes were assessed as objectively measured, well validated (i.e. published, peer-reviewed validation), or otherwise), withdrawals and drop-outs, intervention integrity and analysis.

We assigned a global rating to each study according to the methods outlined by EPHPP. These assign scores based on the number of "weak" ratings for each study.

- Weak - two or more weak ratings.
- Moderate - one weak rating.
- Strong - no weak ratings.

We piloted tools on a sub-set of included studies to check consistency of criteria application within the team. There were no major differences between reviewers. Two reviewers (KH and RL) assessed each study for bias, and they resolved any disagreements through discussion and, when necessary, with a third reviewer (RG).

Quality appraisal of qualitative studies

We used the Wallace criteria for appraising each study, to determine quality of reporting and appropriateness of method (Wallace 2004; see Appendix 6). We have used this tool in several previous reviews of qualitative research in public health questions (Garside 2010; Smithson 2010). These criteria assess studies based on theoretical perspective, appropriateness of question, study design, context, sampling, data collection, analysis, reflexivity, appropriateness generalisability, and ethics.

To guide readers' understanding of the findings, we reported whether each criterion was met for each study. If a criterion was met and described in the study, we assigned a 'yes', if it was not met we assigned a 'no', and if it was not described we assigned a 'can't tell'.

We derived an overall assessment score, to mirror the approach used for the EPHPP quantitative study global rating. Where the 'essential' Wallace criteria (see Appendix 6) were all met, and seven or more of the 'desirable' criteria were answered positively, qualitative studies were graded 'good'; between four and six 'desirable' positive answers we graded 'moderate'; and nought to three we graded 'poor'. Any studies where the 'essential' criteria were not met we also graded as 'poor'.

Given varied conventions in reporting for qualitative research we have not excluded those studies that received a 'poor' rating. Instead we have indicated in the synthesis section where findings come from these studies. In most cases, these studies provide supporting evidence for themes also identified in higher quality studies, and where there are no high quality studies we report them here as they refer to populations not otherwise included.

Two reviewers (KH and RL) independently undertook appraisal, and resolved disagreements through discussion, with a third reviewer (RG) when necessary.

Confounding in quantitative studies

The characteristics that were specified as important potential confounders for this review were mental health status; age; socioeconomic status; gender; ethnicity; and intervention programme characteristics.

Variation in qualitative studies

Throughout the synthesis we were alert to differences in findings that might be understood in relation to different participant groups as above, as well as similarities between groups.

Measures of treatment effect

We grouped the outcome measures into broad categories for reporting.

Physiological measures included: heart rate, grip strength, aerobic capacity, BMI, weight, body composition, flexibility, blood pressure, balance, waist/hip ratio.

Physical health measures included: no included studies assessed physical health.

Measures of emotional and mental well-being included: Warwick-Edinburgh Mental Well-being Scale (WEMWBS) (http://www.healthscotland.com/documents/1467.aspx), depression, emotional state scale (ESS, adapted from the Osgood Semantic Difference Scale (Tyerman 1984)), Rosenberg self-esteem scale (Rosenberg 1965), Profile of Mood states (POMS) (http://www.mhs.com/product.aspx?gr=cli&id=overview&prod=poms), community cohesion scale, and (according to researcher devised study specific) measures of self-reported health, problems sleeping and feeling anxious.

Quality-of-life measures included: SF36, SF12, and (according to researcher-devised, study-specific) measures of various self-report perceptions on health and well-being-related QoL.

Additional outcomes included physical activity measures: a researcher-devised, study-specific list of four activities and their frequency, and the Scottish Physical Activity Questionnaire (Lowther 1999).

As anticipated, the included studies used a broad range of primary outcome measures and this disparity, alongside poor reporting, meant data were not amenable to meta-analysis.

All of the measures are included in the narrative synthesis.

Unit of analysis issues

Quantitative studies

We did not carry out meta-analysis.

Dealing with missing data

Quantitative studies

We did not carry out meta-analysis, we used a narrative synthesis instead.

We did not request missing data for studies with samples of less than 20, as no further statistical analyses would have been appropriate (see Primary outcomes - quantitative evidence).

We requested missing data from one primary qualitative study author via email (Carter 2008) though data were not available and therefore we used available data for the thematic analyses.

Assessment of heterogeneity

Quantitative studies

We did not carry out meta-analysis.

Participants were heterogeneous, some were referred through mental health or other services, some were general population volunteers and some were on probation.

The issue of heterogeneity was central to this review, as we had hoped to be able to group studies for analysis by both environmental enhancement activity/intervention type used and theoretical background. All included studies reported on activities which fulfilled our criteria outlined in Types of interventions (those which are all of the following: intended to improve the outdoor natural or built environment at either a local or wider level; take place in urban or rural locations; involve active participation; are entirely voluntary, or not; and are NOT experienced through paid employment), and so all came under the broad heading of EECA, however there was very limited reporting detail about the exact nature, scope, duration, and intensity of the interventions. Heterogeneity in the evaluation methodology used in the studies, and the relatively small total number of included studies, precluded subgroup analyses.

Given the broad application of major theories (see Assessment of risk of bias in included studies), we could not undertake any meaningful grouping by theoretical background.

Instead, we grouped studies by intervention intention; and sought to investigate differences in findings and participants descriptively through tabulating and comparing data from two groups of studies. We categorised some activities as "Green Gym" models (defined as a formalised programme of a activities intended to increase fitness and well-being specifically through conservation) compared to the other models that did not explicitly have this distinct focus (for example, activities that were billed primarily as being about conservation).

We also grouped studies by participation type, so that we could compare those individuals who were referred to the programme (for example through mental health services) and those who participated voluntarily.

Assessment of reporting biases

To counter the introduction of publication biases, we used three strategies. Firstly, searches included a comprehensive set of databases as identified by the Information Specialist (CC), and the search strategy was extensively discussed both within and outside the team to be as inclusive as possible. Secondly, two members of the review team (KH and RL) undertook grey literature searches and handsearching of relevant websites to identify unpublished reports and items which were location-specific. Lastly, we contacted the Project Reference Group to identify unpublished literature (Appendix 1).

Identified research was subject to reporting bias: it was typically conducted by those also running the environmental enhancement/conservation activities, without formal research methods training, and it was not reported in the peer-reviewed academic literature. Reported outcomes were not always complete (for example, only certain domains of the SF36) and were potentially based on post-hoc decision making. It is therefore possible that negative or no-effect results were under-reported to some extent.

Data synthesis

Quantitative studies

The included quantitative studies reported a range of different health and well-being outcomes, which we grouped according to broad domain. The studies included did not allow for a formal meta-analysis to establish pooled effect measures for the stated outcomes. Within broad outcome domains, specific outcome measures used were different and calculation of standardised effect estimates was not possible.

Only the SF-36 and the SF-12 was used by more than one study included in the review. However, these were reported selectively, with studies reporting different domains of the scores. The only measures reported in more than one study were the physical component (PCS-12) and mental component (MCS-12) scores of SF-12, and the physical component (PCS-36), mental component (MCS-36), total scores, social domain scores for SF-36. However, the two studies reporting PCS-12 and MCS-12 did not report standard deviations (SD) or raw data, while all three studies reporting SF-36 contained fewer than 20 participants and so were not considered reliable enough to meta-analyse.

We therefore summarised effectiveness results narratively. The synthesis reports outcomes grouped by category (physiological, quality of life etc.) and tabulates results for all studies reporting measures of this outcome category, which we also described narratively in the text.

Qualitative studies

Three review authors (KH, RG and RL) independently read and undertook thematic analysis of the qualitative studies included in the synthesis, to provide a comprehensive picture of the range of themes and concepts available across the studies, as well as commonalities between study findings. Through reading and re-reading the text, we developed a coding frame, which identified nine themes describing people's experiences of participating in EECA and how they thought they were affected by participation. After we had conducted the thematic synthesis, we used the qualitative findings to create and refine our conceptual framework which tried to elucidate how people thought that health and well-being outcomes could be attained. This framework expresses how interventions may result in multiple health and well-being impacts (see Effects of interventions), we developed it through discussion among the review team and with the advisory groups about the findings from the evidence syntheses. We devised it using data from qualitative studies and it illustrates the mechanisms of action through which it is believed that involvement in environmental enhancement activities produces health and well-being effects. In addition it illustrates the various factors (again derived from the qualitative evidence) that could mediate or moderate the mechanisms through which outcomes may occur, and the outcomes themselves.

Pooling quantitative evidence: controlled study designs

Although we identified two studies using controlled designs, they were of different study design and used different study outcomes so were unsuitable for pooling.

One case-control study (Townsend 2005) reported on a set of five-point Likert scales to measure the impact on general health, well-being and social cohesion.

We included one non-intervention study in the review. This retrospective cohort study (Pillemer 2010) reported self-reported activity and depression among those involved in environmental enhancement volunteering compared to those undertaking other kinds of volunteering.

Narrative synthesis of quantitative evidence (including uBAs)

Due to the limited evidence from controlled studies, we included uBAs in the review. We synthesised these studies alongside controlled studies (see above, 'Pooling quantitative evidence') using narrative methods (Popay 2006).

We excluded two 'n=1' studies from this final synthesis due to lack of robust study design (Brooker 2008a; Brooker 2008b) (see Included studies).

We quality appraised all the remaining 19 quantitative studies as 'weak' on the EPHPP scale and so the synthesis did not try to account for differing levels of quality. Four studies (Barton 2009 (n = 19); Eastaugh 2010 (n = 8); Reynolds 1999a (n = 16); Small Woods 2011b (n = 7)) had sample sizes of less than 20, making statistical analyses potentially unreliable. Therefore we included these studies in the synthesis, but did not ascribe statistical significance to the results reported.

We grouped outcome measures by broad outcome domain (physiological measures; measures of mental and emotional health; quality of life) and then by specific measure (e.g. grip strength, blood pressure; Rosenberg Self-esteem Scale, Profile of Mood States; SF-36, SF-12) for tabulation and narrative summary. Tables summarising these are included are in Results.

We were restricted to synthesising all EECA interventions (those which are intended to improve the outdoor natural or built environment at either a local or wider level; take place in urban or rural locations; involve active participation; are entirely voluntary, or not; and are NOT experienced through paid employment) as a single group, as no studies assessed the effects of individual interventions.

The disparity of outcome measures, small sample sizes and design heterogeneity used by the included studies meant conversion of findings to odds ratios (ORs) and standardised mean differences (SMDs) was not appropriate, however we have narratively explored similarities and differences in the findings by grouping and juxtaposing them based on factors such as: type of participant (for example those referred through mental health services compared to those volunteering for leisure); type of activity (those focused on, or aiming to improve health in comparison to those focusing on the conservation activities); or context of activity (urban or rural).

Qualitative evidence synthesis

Qualitative data, in the form of quotes from research participants, represents the way in which these people interpret the world and their experiences of it. The ways in which these experiences are expressed are sometimes called 'first order constructs' (Britten 2002).

The analysis of this data undertaken by researchers represents the way in which they have interpreted participants' expressions of experience, and these are sometimes called 'second order constructs'. Qualitative analysis exists on a continuum, with descriptive findings being closest to the data, and representing the least transformation from it, and interpretive explanations of the data being furthest from the data, or most transformed through analysis (Sandelowski 2007). Where qualitative analysis is descriptive, the work of the researchers represents more of an ordering and describing, rather than representing any deeper conceptualisation or theorising. In these cases, the first and second order constructs are often broadly similar. In this review, the included qualitative research was largely descriptive in nature. Since first and second order constructs were similar, they can be synthesised together using thematic analysis, and we have reported participants' quotes to retain the immediacy and authenticity of participants' voices.

We imported findings from included qualitative studies into Microsoft Excel for coding. Two review authors (RL and KH) developed the coding frame, with regular discussions with a third review author (RG).

Overarching synthesis

We produced a narrative synthesis of the included quantitative and qualitative evidence. In considering the evidence from both quantitative and qualitative research, we were interested in any potential moderators and mediators of impact that might result from differences in participants, type of programme, or other characteristics. The limitations in the quantitative evidence, in terms of extent, quality and consistency in outcome measures, prevented us from exploring heterogeneity statistically. Analysis of the qualitative research was also sensitive to these potentially important study contexts. This allowed us to theorise about possible important differences in experience for different groups of people at different times and in different circumstances.

Conceptual framework

We used the processes of synthesis (the individual quantitative and qualitative and then the overarching syntheses) to iteratively refine our conceptual framework (Anderson 2011). Further details can be seen in the Discussion section of this report. The framework represents the reviewers' attempt to graphically illustrate participants' perceptions (through qualitative evidence included in the review) to understand how participation in EECA might lead to health and well-being impacts. These are sometimes referred to as mechanisms of action, or programme theories.

The framework, expressed as a conceptual model, represents the range of potential pathways through which EECA might impact on health and well-being. The model is not specific to any particular population as it tries to capture the possible pathways that any individual may experience; indeed, individuals may follow different pathways for different events in which they participate, and their experience may change over time. It is designed to illustrate that certain factors, such as motivations, the place in which the activity takes place and the purpose of the activity, could affect the types of outcomes achieved. We derived the model from included qualitative evidence and the review authors' interpretations. We sought the input of the Project Reference Group at two stages in the development of this framework.

We developed the first iteration of the model in the summer of 2012, through a reading of the literature and the first PRG meeting, and we outlined the ways in which it appeared that participation in environmental enhancement and conservation activities could potentially impact on physical, mental and emotional well-being. The development from this to the final version is described in the Discussion).

Subgroup analysis and investigation of heterogeneity

This review aimed to draw out the interacting effects between mechanisms, outcomes and sub-groups, however this was limited by poor reporting and equivocal findings. As there was insufficient compatible data to investigate these statistically, we tried to explore possible differences using tabulation according to group factors, and juxtapose findings by various study and population characteristics. We also tried to capture the possible differences through illustrating potential mediator and moderator effects in the conceptual framework.

Study findings were initially grouped based on outcome. Subsequently we grouped based on the route to participation (i.e. voluntary or referred), and also inclusion of formalised 'branded' programmes (Green Gym and Landcare) versus less formalised programmes.

We investigated the impact of different types of programmes (e.g. woodland maintenance vs. path creation) and different contexts (e.g. urban setting vs. rural or woodland vs. coastal), however there was insufficient data to assess these characteristics as mediating variables.

We also wanted to explore potential impacts on specific subgroups; such as those with mental ill health or older people, and also explored socio-economic differences where data allowed. Initial exploration of the grey literature and scoping searches indicated that there was potential for levels of health inequality to be perpetuated across those from lower socio-economic backgrounds and those with mental ill health. As such, these two groups were prioritised in our tabulations of study findings by subgroup.

RESULTS

Description of studies

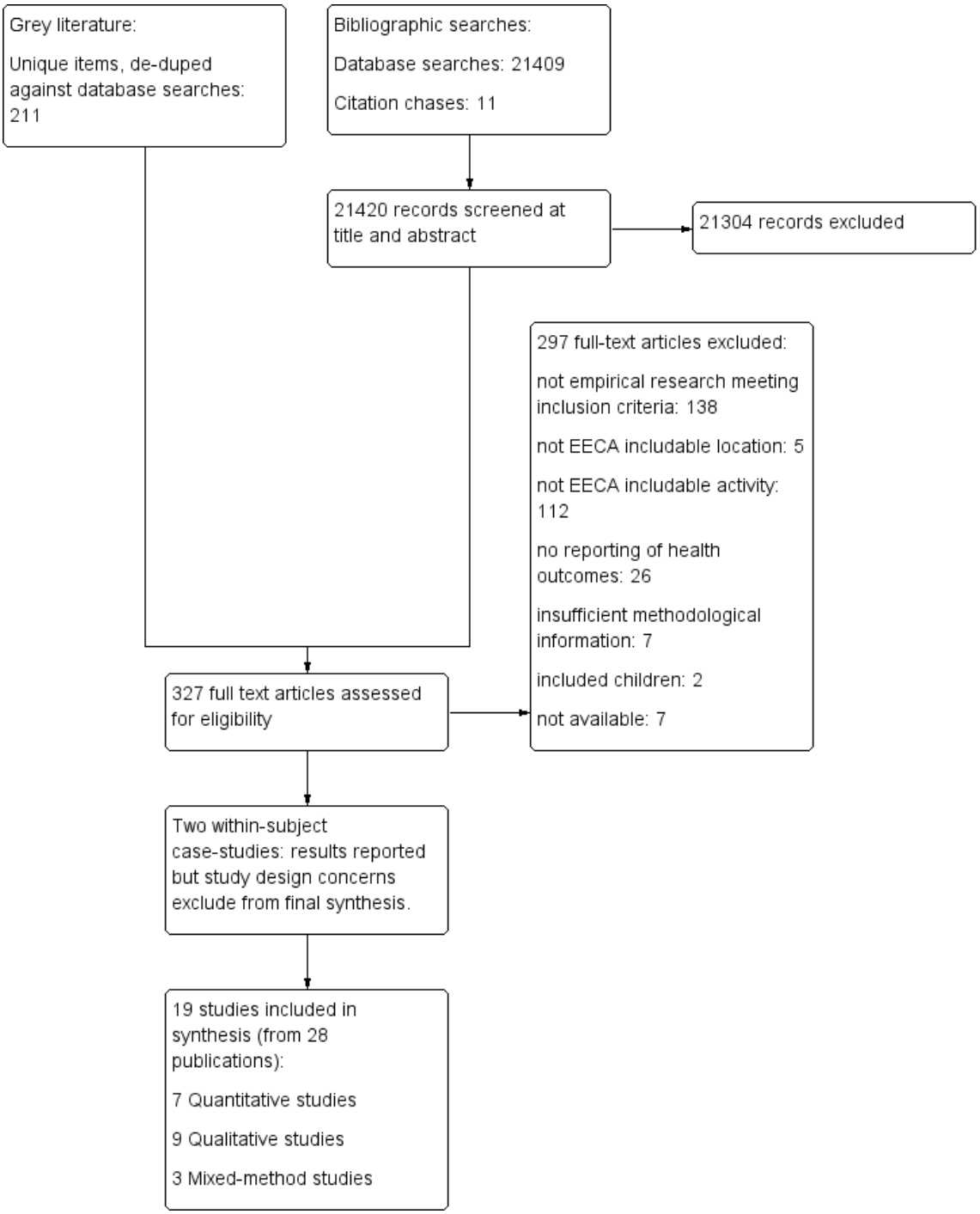
See: Characteristics of included studies; Characteristics of excluded studies.

Results of the search

The combined number of hits resulting from the database searches (completed in October 2012 and updated in October 2014), grey literature searches (conducted in September 2012) and citation chases, was 21,631. Two reviewers (KH and RL) independently carried out initial screening of titles and abstracts to remove clearly irrelevant studies, after which 327 items were considered to be potentially includable. Two reviewers independently assessed the full texts and excluded 297 items (see Characteristics of excluded studies).

We found 21 studies which met the inclusion criteria of the review. Two within-subject case studies, each with only one participant, met the inclusion criteria and we have described them in the Characteristics of included studies table but the lack of robustness of this study design meant that we did not include them in the final synthesis. The synthesis therefore includes 19 studies reported in 28 publications. Figure 1 is a study flow diagram of the selection process.

Figure 1. Study Flow diagram.



Location of evidence

Locating evidence for this review drew upon a variety of search methods which reflected the diffuse nature of the literature base. Our initial grey literature search and web site trawl produced the majority of the evidence included in this review. In fact we identified no new quantitative studies through database searches, although we did locate follow-up reports relating to already identified studies. Database searches uniquely identified only two qualitative studies (Burls 2007 (n = 11); Gooch 2005 (n = 85)). By contrast, nine studies were not in the databases and we identified them only through direct contact with organisations. The location of evidence for this review is represented in an image accessible here: http://wp.me/p31J6p-6C.

The result vindicates our diffuse search strategy and also highlights the contributory role played by the PRG in identifying evidence locations and making contact/web site recommendations.

Included studies

Studies not included in the synthesis

Our searches identified two within-subject case-studies (Brooker 2008a; Brooker 2008b), each with only one participant. We have described them here and listed them in the Characteristics of included studies tables for completeness, but have not further examined them in the synthesis due to lack of robustness of this study design.

Brooker 2008a (n = 1) compared outcomes for a single participant, also one of the researchers, undertaking three activities: a Green Gym session consisting of vegetation clearance and two gym workouts as control activities. These sessions were undertaken over a period of four days and heart rate was measured using a chest-strap sensor and wrist mounted receiver and display.

Brooker 2008b (n = 1), compared outcomes after the same participant undertook seven activities: two separate Green Gym activities and five controls including domestic activity, a cross-country run, an all body workout and a gym workout. The study measured heart rate in the same way. The reported results indicate that the individual's heart rate while undertaking Green Gym activities was not different to that recorded during strength exercises and cardiovascular exercises.

Studies included in the synthesis

Please see: Characteristics of included studies,

We did not identify any randomised studies.

Nineteen studies meeting the inclusion criteria were reported in 28 publications. The characteristics of the included studies are represented in images accessible here: http://wp.me/p31J6p-6C.

- Seven were quantitative studies: one case-control study (Townsend 2005), five uBAs (Barton 2009; Eastaugh 2010; Reynolds 1999a; Small Woods 2011a; Yerrell 2008;) and one retrospective cohort study (Pillemer 2010). This latter study by Pillemer 2010 was a non-intervention study, which assessed associations between health and well-being in an environmental volunteering group, and those undertaking other types of volunteering activities.
- Nine were qualitative studies (Birch 2005; Burls 2007; Caissie 2003; Carter 2008; Christie 2004; Gooch 2005; O'Brien 2010a; Townsend 2004; Townsend 2006).
- We also included three studies which used mixed methods (where both the quantitative and qualitative elements met the inclusion criteria) in the synthesis (BTCV 2010a; O'Brien 2008a; Wilson 2009).

Four quantitative studies had small sample sizes (i.e. less than 20), Barton 2009 (n = 19), Eastaugh 2010 (n = 8), Reynolds 1999a (n = 16), and Small Woods 2011a (n = 7). We included these studies in the synthesis for completeness. However, given the small sample sizes and the associated problems of robust statistical testing, we have not reported the statistical significance of the results in these studies, even when reported as such in the original study.

Participants

The total number of participants across all included studies was 3648 (3277 in quantitative studies (including 2630 in a large retrospective cohort and 647 in intervention studies) and 371 in the eight qualitative studies that stated participant numbers). One qualitative study did not report participant numbers (Carter 2008). The characteristics of participants in included studies is represented in an image accessible here: http://wp.me/p31J6p-6C.

The majority of included studies (14/19) included fewer than 100 participants, with the percentage of women across studies ranging from 100% to 26%, although eight studies did not report the numbers of men and women in the sample. Mean ages, where reported (12/19 studies), were in the 30s (one study), 40s (seven studies), 50s (one study) and 60s (three studies). Participants were mostly 'traditional' volunteers (13/19 studies). Five studies reported that they included people who were referred to participate by either a general practitioner, social worker or mental health professional (BTCV 2010a; Carter 2008; Eastaugh 2010; Small Woods 2011a; Yerrell 2008). Two studies included people going through the probation system (Carter 2008; Wilson 2009) (see Effects of interventions).

There is a UK focus amongst the included studies with 12 studies based there (63%). We also collected evidence from five Australian studies, Christie 2004 (n = 18), Gooch 2005 (n = 85), Townsend

2004 (n = 18), Townsend 2005 (n = 102), Townsend 2006 (n = 80), one Canadian study, Caissie 2003 (n = 10) and one US study, Pillemer 2010 (n = 2630). We did not find any studies that met the inclusion criteria from other European countries, Africa, Asia or South America.

Outcomes

Quantitative studies

The included quantitative studies reported a range of different health and well-being outcomes (see Table 1), and we grouped them according to broad domains.

Only one study reported physiological measures (Reynolds 1999a (n = 16)).

No studies reported physical health measures.

Four studies reported mental and emotional health outcomes. Barton 2009 (n = 19) examined the impact of environmental enhancement and conservation activity on measures of self-esteem (Rosenberg Self-Esteem scale) and mood states (using the Profile of Mood States measure). Townsend 2005 (n = 102) devised a set of five-point Likert scales to measure the impact on general health, well-being and social cohesion. The Emotional State Scale was used by O'Brien 2008a (n = 88), whilst Pillemer 2010 (n = 2630) devised a set of 18 items to examine associations between self-reported activity and depression characteristics.

Quality of life was the most commonly reported outcome measure with six studies using the SF36, or the shortened version SF12: BTCV 2010a (n = 136); Eastaugh 2010 (n = 8); Reynolds 1999a (n = 16); Small Woods 2011a (n = 7); Wilson 2009 (n = 77); Yerrell 2008 (n = 194). However even amongst these there was disparity around which domains of the scales were measured and reported.

Qualitative studies

Qualitative studies considered the experiences of those participating in environmental enhancement activities. Nine themes relating to the reported experiences of participants were identified through thematic analysis: personal achievement, personal/social identity, developing knowledge, benefits of place, social contact, physical activity, spirituality, psychological benefits and some limited risks of participation.

Interventions

All included studies described interventions that met the definition of EECA as described in Types of interventions and so were included in the narrative synthesis, note that as described above the two n=1 studies were not synthesised. The majority of the activities anticipated at the protocol stage were present in included studies (see Types of interventions), however we did not find any evidence referring to litter picking.

Studies often poorly reported specifics of the interventions, with little detail regarding the frequency, duration and intensity of activities or any indication about the actual nature of the environmental enhancement undertaken.

Most studies (12/19) did not report the intensity and frequency of activity undertaken (see Characteristics of included studies). Where reported, participants tended to undertake activities on a weekly basis, or every two weeks, for between two to three hours, with some full-day sessions. An exception was a study examining the health impacts of participation in volunteer tourism in Canada (Caissie 2003 (n = 10)), where participation was full time for between three and 17 days.

The location of activities was mostly rural, though five studies included references to urban or peri-urban contexts (Christie 2004 (n = 18); O'Brien 2010a (n = 10); Pillemer 2010 (n = 2630, not an intervention study); Townsend 2004 (n = 18); Wilson 2009 (n = 77/29)). Activities were primarily conducted in open countryside, woodland or nature reserves though again reporting of specific locations was poor.

Whilst some studies (Eastaugh 2010 (n = 8); Small Woods 2011a (n = 7)) listed specific tasks undertaken by participants, others employed broad categories such as "land care activities" without further detail (Gooch 2005 (n = 85)). The actual environmental and conservation activities participants undertook included tree planting and woodland creation, hedge building, pathway creation, watershed restoration, habitat restoration, landcare, and forestry or woodland management. Actual levels and types of physical activity are therefore largely unknown.

Although all studies met the inclusion criteria regarding the type of activities undertaken we were restricted to performing the synthesis of EECA interventions as a single group, as no single EECA type was assessed by more than one study. Due to the lack of studies assessing effects of any single EECA type, further analysis by intervention type was not possible. Similarly, grouping of studies according to level of physical activity undertaken was not possible.

One sub-group we did identify was those studies which detailed the impacts of a consistent and 'branded' activity known as the 'Green Gym' (a formalised programme of a activities intended to increase fitness specifically through conservation), which was the subject of four studies (Barton 2009 (n = 19); Reynolds 1999a (n = 16); Yerrell 2008 (n = 194); BTCV 2010a (n = 136/19)).

Specific details of the activities considered in each study is provided below:

Quantitative studies

Barton 2009 (n = 19) included two main activities: 1) Conservation volunteering in an Area of Outstanding Natural Beauty (n = 17) and, 2) Green Gym activities (n = 2). The first of these was an all-day session (10 am to 4 pm), meeting twice a week all year

round, the second was a two-and-a-half-hour activity, though the study authors did not specify frequency.

Research conducted in 2009 by BTCV 2010a (n = 136) examined volunteers who undertook invasive species clearing, planting, seeding, clearing and renovation over a four-week period, but the number and length of sessions is not known.

The participants in the study by Eastaugh 2010 (n = 8) took part in woodland-based activities (such as coppicing) over six months, designed to improve health, with the aim of giving completers a progression route towards qualifications, but the number and length of sessions was not reported.

The mixed methods study by O'Brien 2008a (n = 88) included a quantitative element reporting on participants engaged in activities such as vegetation clearance, fence creation, tree planting and thinning, and the removal of invasive species over a three-week period, once or twice a week, for a total of between eight and 33+ hours in total.

Pillemer 2010 (n = 2630) was a non-intervention retrospective cohort study examining data from the 1974 and 1994 waves of the US Alameda County Study, and compared those self-selecting as participating in "environmental volunteering" with those selecting "other volunteering." The study gave no detailed information about the exact nature of environmental volunteering.

Reynolds 1999a (n = 16) examined 'Green Gym' activities. These focused on vegetation clearance, erecting fences, coppicing and planting trees for three hours, twice a week, over six months.

Small Woods 2011a (total n = 7) reported two intakes of participants, where women received expert tuition and support to gain skills in woodland management and greenwood crafts. Participants undertook these activities for two days per week for a total of 12 weeks.

The case-control study conducted by Townsend 2005 (n = 102) included 102 participants, half of whom were members of Australian land-management groups and half of whom reported that they did not take part in landcare-type activities. The study gave little detail about the activities participants were involved in.

The 77 individuals completing the study by Wilson 2009 (n = 77) undertook invasive species removal, tree management, pruning, mulching and some outdoor education for an average of 9.8 weeks, attending three hours per week, over a twelve-week period.

In the uBA conducted by Yerrell 2008 (n = 194), members of Green Gym participated for between one and four hours weekly, for a total of three months. Green Gym involves typical conservation activities such as woodland maintenance.

Qualitative studies

In Birch 2005 (n = 3), participants engaged in conservation volunteering for three hours every two weeks.

The qualitative element of the BTCV 2010a (n = 19) study reported on participants who undertook invasive species clearing, planting, seeding, clearing and renovation over a four-week period (as above).

Burls 2007 (n = 11) examined 11 participants engaged in environmental activities (not further defined) in green spaces provided by the UK mental health charity Mind but again the number and length of sessions was not reported.

The study conducted by Caissie 2003 (n=10) examined volunteer tourists on three to 17 day conservation vacations. But the number and length of sessions was not reported.

Carter 2008 (n = Unknown, poor quality) evaluated a pilot study in 2008, which sought to engage community service and custodial participants in the "Offenders and Nature" scheme, which consisted of reparative work undertaken in public spaces. No further details were provided.

Christie 2004 (n = 18) interviewed Australian conservation volunteers involved with the "Greening Western Sydney" programme. Activities centred on the rehabilitation of the peri-urban areas around Sydney in which participants engaged weekly, but the time period of the activities was not reported.

Gooch 2005 (n = 85) interviewed participants volunteering to restore water catchment areas along the east coast of Australia, with individuals engaging in a range of stewardship activities. The number and length of sessions were not reported.

The mixed methods study by O'Brien 2008a (n = 88) and later work in O'Brien 2010a (n = 10) included interviews with participants involved in a range of outdoor environmental volunteer activities. These included vegetation clearance, fence creation, tree planting and thinning and the removal of invasive species over a three-week period, once or twice a week, for a total of between eight and 33+ hours.

Townsend 2004 (n = 18) examined conservation volunteers' experiences in two projects in Australia; first, the members of the Friends of Damper Creek and Truganina Explosives reserve, and second, later work, also in Australia, examined the perceptions of volunteers for the Trust for Nature groups (Townsend 2006 (n = 80)). The number of sessions, their length or over what time period was not reported.

The qualitative findings of the mixed methods study by Wilson 2009 (n = 29) described participants undertaking invasive species removal, tree management, pruning, mulching and some outdoor education, for an average of 9.8 weeks, attending three hours per week, over a twelve-week period.

Theoretical approaches

In reporting of theoretical approaches to understanding how environmental enhancement activities might lead to health and well-being impacts, studies either referred to no theoretical literature or tended to refer to broad, generic theories.

Those studies containing limited or no discussion of theory (for example, Small Woods 2011a (n = 7)), were often grey literature reports which were descriptive evaluations rather than academic papers. Even those studies which described some theoretical liter-

ature tended to outline generic theories linking human well-being with contact with nature, such as biophilia (Wilson 1984) and attention restoration theory (Kaplan 1989). No study used, for example, a logic model to illustrate how it was anticipated that health and well-being outcomes would come about through the intervention activities. The generic theories were not linked to the methods or approach taken in the studies, beyond participation in outdoor activities, and were not subsequently discussed in relation to the evidence produced (Barton 2009 (n = 19); Wilson 2009 (n = 77/29); Yerrell 2008 (n = 194)).

Given this limited discussion of formal academic theory in the included studies, we focused more on practitioner and participant lay theories regarding how health and well-being impacts were thought to accrue from the activities undertaken. Members of the PRG who organise EECA largely provided practitioner views, and we drew participants' views from the qualitative evidence included in this review. These theories contributed to the development of the mechanisms of action which we used to refine later iterations of our conceptual framework.

Excluded studies

Please see: Characteristics of excluded studies.

Our search strategy, including direct contact with organisations and web searches, led to a higher number of full-text articles than usual being obtained (116 items from database searches, 211 from direct contact searches). Items excluded at full text (297) are listed in the Characteristics of excluded studies.

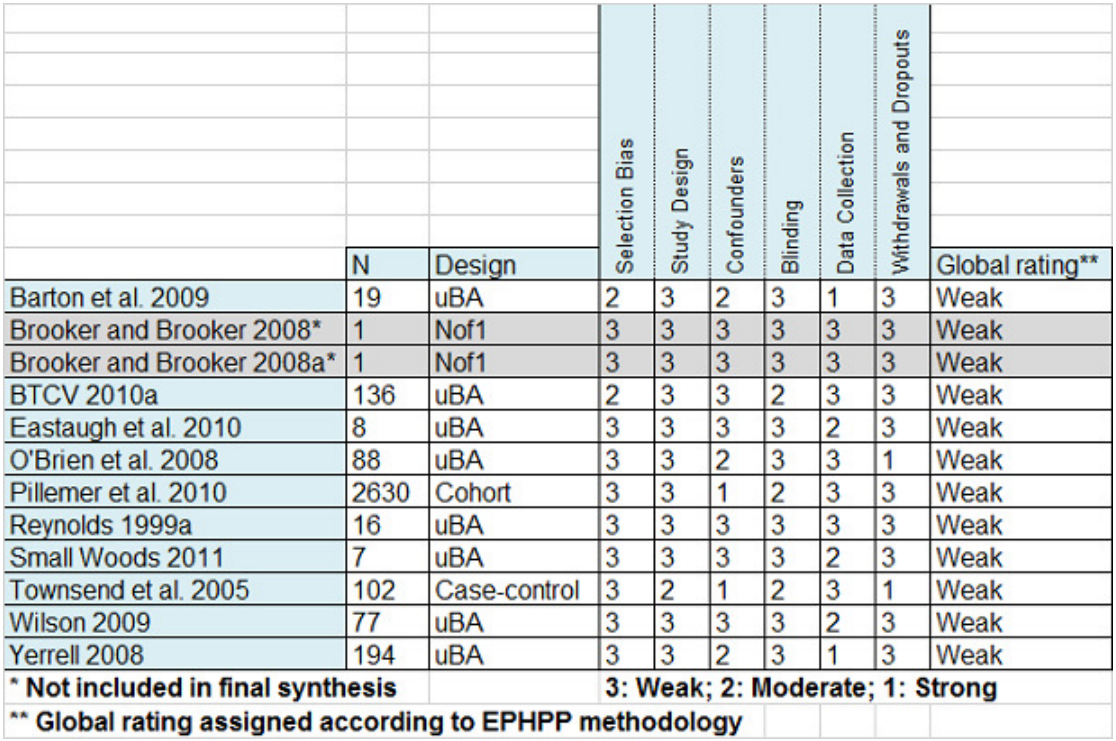
We commonly excluded papers that did not detail empirical research (including editorials, think pieces, policy documents and book reviews). This category also contained a significant number of project description reports, in which there were no reported findings or methods. Such papers outlined objectives and the stated achievements of the project; they might have presented quotes from participants, but did not report methods of data collection or analysis.

Another large exclusion category related to studies of types of activities that did not meet our criteria of improvement or enhancement of the environment. For example, studies of contact with nature through nature walks did not meet our inclusion criteria. Another set of studies were excluded due to activity location, such as private domestic gardening. There were also potentially eligible studies which could not be included due to lack of information about included activities, outcomes or methodological approach. We also excluded cross-sectional surveys, although we recognise that for many of the small organisations contacted (with budget and time constraints) these reports represent a significant undertaking.

Risk of bias in included studies

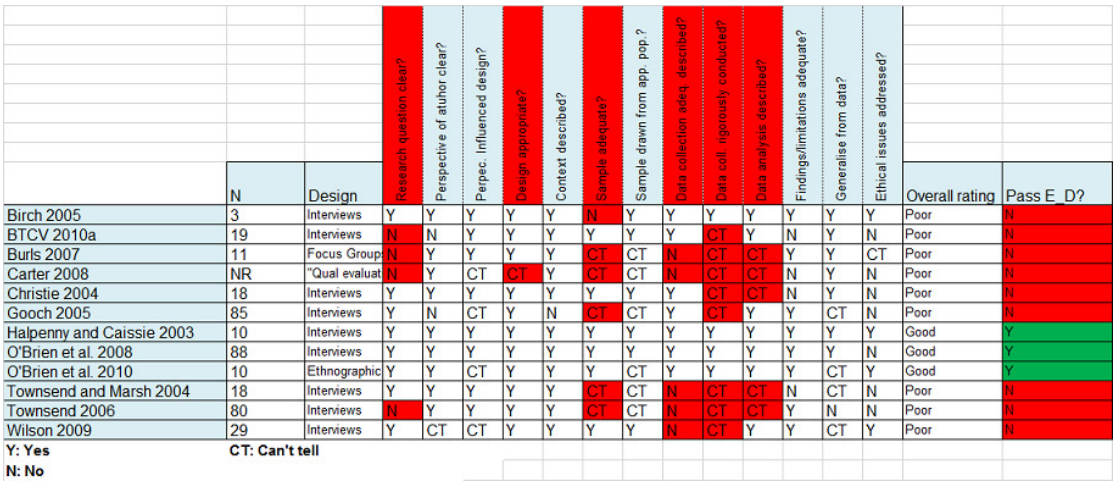
The overall quality scores for each quantitative study (derived using the EPHPP tool and methodology for assigning a global rating), and each qualitative study (derived from the Wallace criteria) are presented in Figure 2 and Figure 3.

Figure 2. EPHPP quality assessment scores for included quantitative (and quantitative element of mixed-method) studies



	N	Design	Selection Bias	Study Design	Confounders	Blinding	Data Collection	Withdrawals and Dropouts	Global rating**
Barton et al. 2009	19	uBA	2	3	2	3	1	3	Weak
Brooker and Brooker 2008*	1	Nof1	3	3	3	3	3	3	Weak
Brooker and Brooker 2008a*	1	Nof1	3	3	3	3	3	3	Weak
BTCV 2010a	136	uBA	2	3	3	2	3	3	Weak
Eastaugh et al. 2010	8	uBA	3	3	3	3	2	3	Weak
O'Brien et al. 2008	88	uBA	3	3	2	3	3	1	Weak
Pillemer et al. 2010	2630	Cohort	3	3	1	2	3	3	Weak
Reynolds 1999a	16	uBA	3	3	3	3	3	3	Weak
Small Woods 2011	7	uBA	3	3	3	3	2	3	Weak
Townsend et al. 2005	102	Case-control	3	2	1	2	3	1	Weak
Wilson 2009	77	uBA	3	3	3	3	2	3	Weak
Yerrell 2008	194	uBA	3	3	2	3	1	3	Weak
* Not included in final synthesis			3: Weak; 2: Moderate; 1: Strong						
** Global rating assigned according to EPHPP methodology									

Figure 3. Wallace criteria quality assessment scores for included qualitative studies



	N	Design	Research question clear?	Perspective of atuhor clear?	Perpec. Influenced design?	Design appropriate?	Context described?	Sample adequate?	Sample drawn from app. pop. ?	Data collection adeq. described?	Data coll. rigorously conducted?	Data analysis described?	Findings/limitations adequate?	Generalise from data?	Ethical issues addressed?	Overall rating	Pass E_D?
Birch 2005	3	Interviews	Y	Y	Y	Y	Y	N	Y	Y	Y	Y	Y	Y	Y	Poor	N
BTCV 2010a	19	Interviews	N	N	Y	Y	Y	Y	Y	Y	CT	Y	N	Y	N	Poor	N
Burls 2007	11	Focus Groups	N	Y	Y	Y	Y	CT	CT	N	CT	CT	Y	Y	CT	Poor	N
Carter 2008	NR	"Qual evaluat	N	Y	CT	CT	Y	CT	CT	N	CT	CT	N	Y	N	Poor	N
Christie 2004	18	Interviews	Y	Y	Y	Y	Y	Y	Y	Y	CT	CT	N	Y	N	Poor	N
Gooch 2005	85	Interviews	Y	N	CT	Y	N	CT	CT	Y	CT	Y	Y	CT	N	Poor	N
Halpenny and Caissie 2003	10	Interviews	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Good	Y
O'Brien et al. 2008	88	Interviews	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	Good	Y
O'Brien et al. 2010	10	Ethnographic	Y	Y	CT	Y	Y	Y	CT	Y	Y	Y	Y	CT	Y	Good	Y
Townsend and Marsh 2004	18	Interviews	Y	Y	Y	Y	Y	CT	CT	N	CT	CT	N	CT	N	Poor	N
Townsend 2006	80	Interviews	N	Y	Y	Y	Y	CT	CT	N	CT	CT	Y	N	N	Poor	N
Wilson 2009	29	Interviews	Y	CT	CT	Y	Y	Y	Y	N	CT	Y	Y	CT	Y	Poor	N
Y: Yes	CT: Can't tell																
N: No																	

All of the included quantitative studies were rated as 'weak'. Detailed descriptions are shown in the risk of bias tables in Characteristics of included studies. The EPHPP tool and the scoring criteria used to derive each rating is shown in Appendix 6.
The following sections comment on risk of bias in the included quantitative evidence and are structured around the nine EPHPP domains of selection bias, study design, confounding, withdrawals, blinding, intervention integrity and analyses.

Selection bias

We assessed the potential for selection bias amongst the studies included in this review to introduce a high risk of bias, due to the use of poor sampling methods and poor reporting. Apart from Barton 2009 and BTCV 2010a, no study reported the total number of people participating in the intervention from which the sample was drawn, the proportion that were recruited to participate in the research, or the methods of recruitment to the activity or study. We also assessed differences between groups at baseline on age, sex and diagnosis; and assigned ratings accordingly or 'can't tell' where there was insufficient reporting.
Pillemer 2010 (n = 2630) used a retrospective cohort design. We rated this study as having a high risk of selection bias as the study analysed existing data: the authors examined associations between health and different types of self-reported volunteering activity in a longitudinal study. We assumed that individuals were self-selecting to each volunteering activity.

Study design

We did not identify any randomised studies. Included studies were mostly uncontrolled. We rated all but one (Townsend 2005) as weak for study design on the EPHPP scale.
The nature of EECA means that controlled trials are methodologically challenging. In addition several evaluations were conducted by those leading the activities (people who were not professional researchers or evaluators) with minimal time and financial input, which may further explain the relatively weak evidence base.
We only identified two studies that included comparator groups (Townsend 2005; Pillemer 2010).

- Little detail was given about the comparison group in the case-control study by Townsend 2005 (n = 102). Of the 102 participants, the 51 cases were members of land-management groups and the 51 control participants, matched for age and sex, were recruited in a variety of settings (pubs, community centres and shopping centres). Whilst the control group were shown to be similar according to the demographic characteristics included in the analysis, the approach has a high risk of systematic selection bias.
- Pillemer 2010 (n = 2630) examined data from the 1974 and 1994 waves of the US Alameda County Study in a non-intervention retrospective cohort study of the association of health outcomes of environmental volunteers in comparison to non-environmental volunteers. Due to the study design we were unable to state the causal direction of the associations.

Confounding

We rated only the retrospective cohort study (Pillemer 2010) as strong in terms of controlling for confounders (controlled across key variables at baseline). We rated three studies (Barton 2009; O'Brien 2008a; Yerrell 2008) as moderate (as they controlled in the analysis) and the rest we rated as weak in terms of confounding variables.
Most studies reported only limited participant characteristics. Some lacked even basic details, like age or sex, or both (BTCV 2010a; Eastaugh 2010; Small Woods 2011a; Wilson 2009) and did not undertake adjusted analysis.

Blinding

We did not rate any studies as strong for this factor. We rated three studies (BTCV 2010a; Pillemer 2010; Townsend 2005) as moderate on the scale, the rest we rated as weak in terms of blinding.
The process of blinding is used to limit participants' or investigators' knowledge of the intervention or research question in order to reduce bias in the reporting of outcomes. Due to the type of activities and the scale of the research undertaken (predominantly small-scale evaluations) it is likely that it was not feasible to blind the participants to the intervention received. It was theoretically feasible to blind the assessors to the status of the participants however there is no evidence that this happened in any of the studies. It might have been possible to blind participants to the nature of the research question being addressed, however none of the studies reported whether or not this happened.

Data Collection

We rated two studies (Barton 2009; Yerrell 2008) as strong for data collection on the on the EPHPP scale, three studies (Eastaugh 2010; Small Woods 2011a; Wilson 2009) as moderate, and the remaining studies as weak due to the use of non-validated scales or selective measuring or reporting of validated scales. Measures used for each of the outcome categories are detailed below.

- The **physiological measures** used by Reynolds 1999a were objective and validated approaches to assessing the relevant outcomes: grip strength (kgs), aerobic capacity (using the Rockport one mile walking test), BMI, weight, body composition, flexibility (sit and reach methods), blood pressure, balance (using the Stork stand method), and waist/hip ratio.
- No studies reported on**physical health outcomes.**
- Five studies reported on measures of **mental and emotional health**. These were a mixture of existing validated scales and those developed within the project:
    - One study (Wilson 2009) used the validated Warwick-Edinburgh Mental Well-being Scale (WEMWBS) (http://www.healthscotland.com/documents/1467.aspx).

- Barton 2009 used the validated Profile of Mood States scale (http://www.mhs.com/product.aspx?gr=cli&id=overview&prod=poms) and the validated Rosenberg Self-Esteem scale (Rosenberg 1965) .
- One study (O'Brien 2008a) used an Emotional State Scale, which is an un-validated adaptation of the Osgood Semantic Differential Scale (Tyerman 1984).
- The retrospective cohort study (Pillemer 2010) used an 18-item self-report scale (un-validated) to assess depression (including items on mood disturbance, loss of energy, problems sleeping, and agitation).
- Townsend 2005 developed three questions (un-validated) relating to self-reported depression, anxiety, and self-esteem.

- **Quality-of-life** data was collected in eight studies. Again, these were a mixture of validated tools and bespoke un-validated tools.
  - The SF-36 (http://www.sf-36.org/) (Eastaugh 2010; Reynolds 1999a; Small Woods 2011a) and shortened version SF-12 (http://www.sf-36.org/tools/sf12.shtml) (BTCV 2010a; Wilson 2009; Yerrell 2008) were the most commonly applied QoL measures and these are validated reliable approaches. However studies reported different domains or selected components from these scales so it is not clear whether the tools were selectively applied or reported.
  - Two studies (Pillemer 2010; Townsend 2005) used un-validated QoL measures based on self-report. Townsend 2005 used a series of general health and well-being questions on a five-point Likert scale (level of well-being; taking prescription drugs; experiencing pain or discomfort; requiring assistance in the community; feeling healthy; visits to their GP; and utilising life skills). The retrospective cohort study used a single question which asked for a self-assessment of general health on a 4-point scale (excellent; good; fair; poor) (Pillemer 2010).
- **Additional outcomes**: Two studies assessed physical activity, both based on self-reports. Wilson 2009 used the validated Scottish Physical Activity Questionaire (Lowther 1999). The retrospective cohort study by Pillemer 2010 used a Likert scale developed for the original survey (http://files.eric.ed.gov/fulltext/EJ792845.pdf), which assessed self-reported frequency of active sports, swimming or long walks, working in the garden, and doing physical exercises.

One study (Townsend 2005) used the validated Buckner 18-item Social Cohesion scale to assess factors relating to community cohesion, social interaction, and social similarity (Buckner 1988).

Timing

There was a lack of reporting detail about timings in studies including pre- and post-intervention measures. Of those reporting timing information (Barton 2009; BTCV 2010a; Eastaugh 2010; O'Brien 2008a; Reynolds 1999a; Small Woods 2011a; Wilson 2009; Yerrell 2008), all post-intervention measures were taken immediately following a varied-length intervention, ranging from three weeks (O'Brien 2008a) to six months (Eastaugh 2010; Reynolds 1999a) and so were 'time since baseline' (TSB) rather than 'time since intervention' (TSI). We report post-intervention times as TSB in the synthesis.

Withdrawals

We rated O'Brien 2008a and Townsend 2005 as strong in relation to drop out and withdrawals, as both reported either low attrition rates or well-reported and assessed drop-out characteristics. The rest of the included studies we rated as weak in terms of withdrawals because they did not report the attrition rates of participants. Furthermore these studies did not report drop-out characteristics.

Intervention integrity

There is little information (beyond the broad notion that all included interventions involved outdoor, physical activities and were intended to enhance the environment) which allows us to assess intervention consistency. We assumed that the actual nature, frequency and intensity of the activities were likely to vary between deliverers, sessions and locations. This would have been the case both for badged activities like the 'Green Gym' and other volunteering activities. There is no indication that, for example 'Green Gym' activities would have been the same for all sessions running under this name. Indeed this may not be desirable, as part of the appeal of the Green Gym may be that varied activities were offered and that they were responsive to individual ability and local need. Individual participants attending the same session may have been more or less involved in different aspects which may have led to varying experiences between participants, including different levels of physical activity or skills gained.

Analyses

The papers provided few details about the approach to analysis, however most of the analyses were descriptive. Some reporting was incomplete, for example reporting that changes in pre and post intervention scores were not statistically significant, without supplying the data (Reynolds 1999a).

A number of studies had small samples sizes (< 20) making attempts to test the statistical significance of differences questionable (Barton 2009 (n = 19); Eastaugh 2010 (n = 8); Reynolds 1999a (n = 16); Small Woods 2011a (n = 7)).

It is difficult to assess whether studies selectively reported outcomes due to the lack of published protocols. The reporting of non-statistically significant outcomes, in most studies, suggests that outcomes were reported comprehensively however there is little additional evidence to support this. Studies did not consistently use or report, all SF-36/12 domains.

The reporting of subgroups and analyses was weak in all included quantitative studies. The nature of the included evidence (often evaluation reports) meant that such reporting may not have been considered pertinent by the authors.

Quality appraisal of qualitative studies

We used the Wallace criteria (Wallace 2004) to assess qualitative studies, which we then summarised into a metric using a similar approach to the EPHPP scores for quantitative studies (see Assessment of risk of bias in included studies). Of the 12 qualitative studies three were rated as 'good' (Caissie 2003; O'Brien 2008a; O'Brien 2010a), and the rest (Birch 2005; BTCV 2010a; Burls 2007; Carter 2008 (n=unknown); Christie 2004; Gooch 2005; Townsend 2004; Townsend 2006; Wilson 2009) as 'poor'. Lower ratings were often the result of studies not meeting the 'essential' reporting criteria, with studies failing to give adequate details about the nature of the sample and methods of sampling, data collection, and data analysis. Few papers addressed ethical issues, which may be due, at least in part, to the number of studies conducted outside of academia.

We did not use qualitative studies to draw conclusions on the effectiveness of activities but rather to identify potential mechanisms of action and to inform our tentative conceptual framework.

Other potential sources of bias

Conflict of interest

There are no studies where the funder is both known and unlikely to have a potential conflict of interest. Many of the included studies may be subject to bias through author conflict of interest. Nine of the nineteen included studies were funded, or received partial funding from, organisations promoting the use of the natural environment (funders given in brackets): Birch 2005 (BTCV); BTCV 2010a (BTCV/Big Lottery); Christie 2004 (Greening Australia); Gooch 2005 (Bush/land/water Care); O'Brien 2010a (Scottish Forestry Trust/Forestry Commission); O'Brien 2008a (Scottish Forestry Trust/Forestry Commission); Townsend 2006 (Parks Victoria/People and Parks Foundation); Townsend 2005 (Trust for Nature); Wilson 2009 (included the Forestry Commission).

Additionally, three studies (BTCV 2010a; O'Brien 2008a; O'Brien 2010a) were authored by the individual working for or associated with the organisation which was providing the intervention or funding the research, or both.

Two study authors were also involved in more than one included study. Liz O'Brien authored or co-authored three included studies (Carter 2008; O'Brien 2008a; O'Brien 2010a), Mardie Townsend authored or co-authored four of the included studies (O'Brien 2008a; Townsend 2004; Townsend 2006; Townsend 2005).

Effects of interventions

Main review findings

We have included a total of 10 studies reporting quantitative findings in the synthesis reported here. Seven were purely quantitative in design: these included one case-control study, Townsend 2005 (n = 102); one retrospective cohort study, Pillemer 2010 (n = 2630); and five uBAs: (Barton 2009 (n = 19); Eastaugh 2010 (n = 8); Reynolds 1999a (n = 16); Small Woods 2011a (n = 7); and Yerrell 2008 (n = 194). We also included the quantitative components (all uBAs) of the three mixed method studies, BTCV 2010a (n = 136); O'Brien 2008a (n = 88); and Wilson 2009 (n = 77).

Twelve studies contributed to the synthesis of qualitative research. Nine purely qualitative studies: Birch 2005 (n = 3); Burls 2007 (n = 11); Caissie 2003 (n=10); Carter 2008 (n = unknown); Christie 2004 (n = 18); Gooch 2005 (n = 85); O'Brien 2010a (n = 10); Townsend 2004 (n = 18); Townsend 2006 (n = 80); and we also included qualitative evidence from the three included mixed method studies: BTCV 2010a (n = 19); O'Brien 2008a (n = 88); and Wilson 2009 (n = 29).

In the following findings section, we have initially reported the quantitative study results by the outcome measure categories (physiological measures; physical health measures; mental and emotional health measures, quality-of-life measures; and the two other measures, physical activity and social contact). In later sections we tabulate and descriptively explore key findings by grouping them according to: 1) referral status of participants (whether referred by health/social services or more 'traditional' volunteers); and 2) according to a specific feature of the type of programmes (whether they are a 'branded' programme, such as Green Gym and Landcare, or not).

Evidence statements summarising all identified studies are shown in Table 1.

Quantitative study evidence

1. Physiological measures

Figure 4

Figure 4. Changes in physiological health measures reported in quantitative studies

Study	Outcomes	Measure	Uncontrolled impact (uBAs)*				Quality of evidence (EPHPP)
			Pre-intervention mean	Post intervention mean	Change	p-value	
Reynolds 1999a (N=16, uBA)	Grip strength (kgs)		32.13	35.47	3.34	p<0.05 [a]	Weak
	Aerobic capacity	Rockport one mile walking test	NR	NR	NR	NS	Weak
	BMI		NR	NR	NR	NS	Weak
	Weight		NR	NR	NR	NS	Weak
	Body composition		NR	NR	NR	NS	Weak
	Flexibility	Sit and reach method	NR	NR	NR	NS	Weak
	Blood pressure		NR	NR	NR	NS	Weak
	Balance	Stork stand method	NR	NR	NR	NS	Weak
	Waist/hip ratio		NR	NR	NR	NS	Weak
NS: Reported as not significant	NR: Not reported						
[a]Statistical significance is inappropriate in studies with samples of less than 20							

Only one out of the 10 studies included in the synthesis reported physiological measures. This was a small, uncontrolled before and after study examining the impact of participation in EECA (Reynolds 1999a) (uBA, n = 16).

The outcomes included by Reynolds 1999a (uBA, n = 16) were grip strength, aerobic capacity, BMI, weight, body composition, flexibility, blood pressure, balance and waist/hip ratio. No change over time in the group was observed in any of the measures except grip strength, where an increase of 3.34 kilograms was reported post intervention (mean pre-intervention 32.13 kg, mean post-intervention (+ 6 months, time since baseline (TSB)) 35.47 kg).

2. Physical health measures

We did not identify any studies that included physical health measures.

3. Mental and emotional well-being

Figure 5

Figure 5. Changes and differences in mental and emotional health measures reported in quantitative studies (studies are ordered alphabetically)

Outcomes		Measure			Comparative impact/associations		p-value	Uncontrolled impact (uBAs)*			p-value	Quality of evidence (EPHPP)
					Intervention group/(Env Volunteers: Pillemer)	Control/(Other volunteers: Pillemer)		Pre-intervention mean	Post-intervention mean	Change		
Barton et al. 2009 (N=19,	Mood state	Profile of Mood states (POMS) (lower value = better mood)	Total mood state	Activity 1	NA	NA	NA	143.62	138.2	-5.42	NR	Weak
				Activity 2	NA	NA	NA	156.00	134.00	-22.00	NR	
			Anger	Activity 1	NA	NA	NA	40.07	38.18	-1.89	NR	
				Activity 2	NA	NA	NA	37.00	42.00	5.00	NR	
			Tension	Activity 1	NA	NA	NA	35.33	32.53	-2.80	NR	
				Activity 2	NA	NA	NA	36.50	31.00	-5.50	NR	
			Vigour	Activity 1	NA	NA	NA	42.20	39.06	-3.14	NR	
				Activity 2	NA	NA	NA	32.50	42.50	10.00	NR	
Barton et al. 2009 (N=19, uBA)	Self-esteem	Rosenberg Self-esteem scale (1989) (lower value = higher self-esteem)		Activity 1	NA	NA	NA	18.59	18.31	-0.28	NR[a]	Weak
				Activity 2	NA	NA	NA	24.00	19.80	-4.20	NR[a]	
O'Brien et al. 2008 (N=88, uBA)	Emotional function	Emotional state scale (ESS) (total score poss 85)		Mean	NA	NA	NA	NR	NR	4.8	p<0.001	Weak
Pillemer et al. 2010 (N=2630, Cohort)	Depression at follow-up	18 item, inc mood disturbance, loss of energy, problems eating and sleeping and agitation		Model 1 (β)*	0.47	0.88	p<0.05	NA	NA	NA	NA	Weak
				Model 2 (β)**	0.49	0.88	p<0.05	NA	NA	NA	NA	
Townsend et al. 2005 (N=102, Case-control)	Depression at follow-up	Feel depressed?'		Means	2	2	NR	NA	NA	NA	NA	Weak
	Depression at follow-up	Problems sleeping'		Means	2.1	2	NR	NA	NA	NA	NA	Weak
Townsend et al. 2005 (N=102, Case-control)	Anxiety at follow-up	Feel anxious'		Means	2.4	2.1	p=0.004	NA	NA	NA	NA	Weak
Townsend et al. 2005 (N=102, Case-control)	Self-esteem at follow-up	Satisfaction with daily activities		Means	1.7	1.9	p=0.003	NA	NA	NA	NA	Weak
Wilson 2009 (N=77, uBA)	Mental wellbeing	WEMWBS			NA	NA	NA	NR	NR	0	p=0.45	Weak

* Model 1 controlled for age, gender, education and marital status at baseline

** Model 2 controlled for model 1 variables, plus social isolation, chonic condition and functional impairment at baseline

NR: Not reported

NA: Not applicable

[a]: Reported by paper but unreliable as N< 20

Five of the 10 studies included in the synthesis (Barton 2009 (uBA, n = 19); O'Brien 2008a (uBA, n = 88); Pillemer 2010 (RC, n = 2630); Townsend 2005 (CC, n = 102); Wilson 2009 (uBA n = 77)) examined the impact of participation in EECA on indicators of mental and emotional well-being. Studies measured a range of impacts using a variety of instruments and where more than one study measured the same outcome (such as depression), different instruments were used to do so.

Wilson 2009 (uBA, n = 77) used the Warwick-Edinburgh Mental Well-being Scale (WEMWBS). The authors indicate that the intervention may lead to little or no change between the pre- and post- intervention measurement values.

Townsend 2005 (CC, n = 102) reported differences between those participating in land management and the control group, across self-reported responses to "feeling depressed", "problems sleeping", "feeling anxious" and "satisfaction with daily activities" on five-point Likert scales (range 1 - 5, with higher scores indicating increased mental stress/less satisfaction). The intervention may lead to little or no difference between the groups in terms of feeling depressed or problems sleeping. Participants being involved in land management may lead to a higher incidence of feeling anxious than those in the control group (land management member mean score 2.4 (SD 0.72), control mean score 2.1 (SD 0.85), P = 0.004, scale 1: never to 5: regularly).

Membership of the land management group may also lead to reporting more satisfaction with their daily activities than the control group (land management member mean score 1.7 (SD 0.70), control mean score 1.9 (SD 0.50), P = 0.003, scale 1: very satisfied to 5: very unsatisfied).

In the study by O'Brien 2008a (uBA, n = 88), participants' mental and emotional well-being was measured at two time points using the Emotional State Scale (ESS). At three weeks' follow up a mean score increase of 4.8 (P < 0.001 scale had a range of 1 - 85), was reported between the pre and post measurements, indicating the intervention may lead to an improvement in mental health.

Barton 2009 (uBA, n = 19) examined participant responses using two measures of mental and emotional well-being before and immediately following participation in the intervention: the Rosenberg self-esteem scale and the Profile of Mood States scale (see above). The activities may have little or no differences in either self-esteem or mood state.

The retrospective cohort study by Pillemer 2010 (RC, n = 2630) reported that there was a reduction in the likelihood of being de-

pressed amongst the participants who self-described as environmental volunteers compared to the other volunteers when controlling (at baseline in 'model 1') for age, gender, education and marital status (environmental volunteers OR 0.47, 95% CI (0.22-1.00) / other volunteers, OR 0.88, 95% CI (0.67-1.14), P < 0.05). There may be little or no difference, however, when examined in a second logistic regression model ('model 2') controlling for social isolation and chronic conditions as well as the model 1 confounders (age, gender, education and marital status).

4. Quality of life (QoL)

Quality of life was the most commonly assessed outcome, with eight of the 10 included studies including at least one measure. Six studies used the SF-36 or SF-12 (BTCV 2010a; Eastaugh 2010; Reynolds 1999a; Small Woods 2011a; Wilson 2009; Yerrell 2008), and two studies used another measure of QoL (Townsend 2005, Pillemer 2010)

Of the three studies using the SF-36, (Eastaugh 2010 (uBA, n = 8); Reynolds 1999a (uBA, n = 15) Small Woods 2011a (uBA, n = 7) none reported all the domains of the measure. Two of the studies reported an overall score and the composite Physical (PCS), and Mental Health Component (MCS) scores (Eastaugh 2010; Small Woods 2011a). Reynolds 1999a reported only General Health and Role Limitation domains.

Of the three studies using the SF-12, only Wilson 2009 (uBA, n = 77) reported all the domains. BTCV 2010a (uBA, n = 136) reported the percentage of participants with an increase or decrease in PCS-12 and MCS-12, however they did not provide the actual data. Yerrell 2008 (uBA, n = 194) reported PCS-12 and MCS-12 but not the results for each of the contributing domains.

Meta-analysis of the results was not feasible given this selective reporting, coupled with the lack of randomised evidence, lack of domain scores, standard deviations (SDs), different follow up periods (see below) and the small sample sizes (n < 20) of four studies (Barton 2009; Eastaugh 2010; Reynolds 1999a; Small Woods 2011a). The results are, therefore, described narratively.

SF-36/SF-12

Figure 6

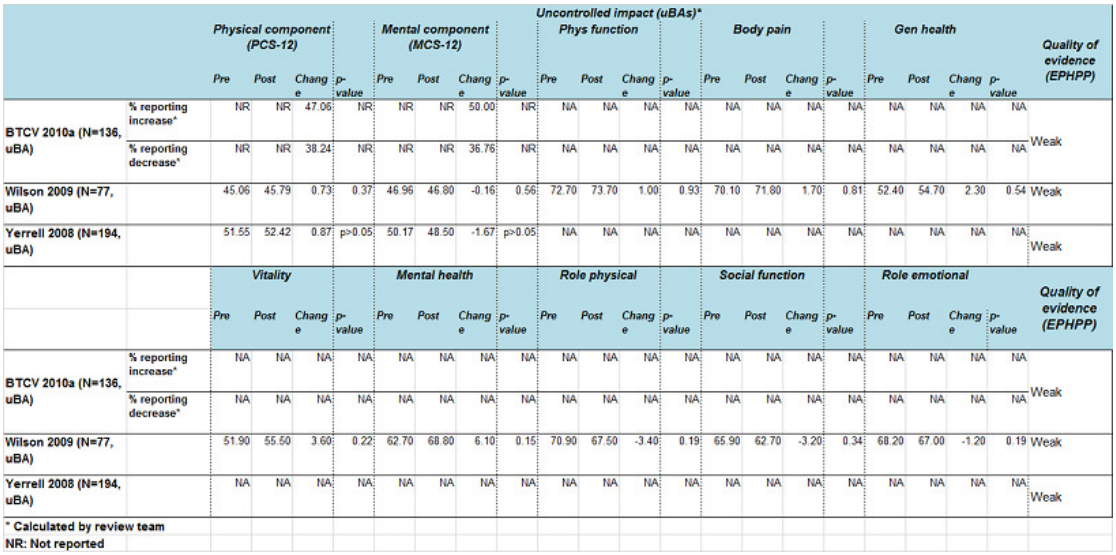
Figure 6. Changes in quality of life (SF-36) measures reported in quantitative studies (studies are ordered alphabetically)

		*Uncontrolled impact (uBAs)**																				*Quality of evidence (EPHPP)*
		SF-36 Total			*Physical (PCS-36)*			*Mental (MCS-36)*			*Social*			*General health*				*Role limitation*				
		Pre	*Post*	*Change*	*Pre*	*Post*	*Change*	*Pre*	*Post*	*Change*	*Pre*	*Post*	*Change*	*Pre*	*Post*	*Change*	*p-value*	*Pre*	*Post*	*Change*	*p-value*	
Eastaugh et al. 2010 (N=8, uBA)		45.25	50.75	5.50	49.00	50.00	1.00	38.12	48.12	10.00	39.25	53.38	14.13	NA	NA	NA	NA	NA	NA	NA	NA	Weak
Reynolds 1999a (N=15, uBA)		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	65.00	71.33	6.33	p>0.05[a]	63.33	83.33	20.00	p>0.01[a]	Weak
Small Woods 2011a (N=7, uBA)	Case Study 1	52.25	61.75	9.50	59.25	64.50	5.25	41.00	54.50	13.50	31.50	62.50	31.00	NA	NA	NA	NA	NA	NA	NA	NA	Weak
	Case Study 2	34.00	37.75	3.75	41.75	42.00	0.25	25.75	30.50	4.75	31.50	34.50	3.00	NA	NA	NA	NA	NA	NA	NA	NA	

[a] Reported by paper but unreliable as N<20

Figure 7

Figure 7. Changes in quality of life (SF-12) measures reported in quantitative studies (studies are ordered alphabetically)



		Uncontrolled impact (uBAs)*																				
		Physical component (PCS-12)				Mental component (MCS-12)				Phys function				Body pain				Gen health				Quality of evidence (EPHPP)
		Pre	Post	Change	p-value	Pre	Post	Change	p-value	Pre	Post	Change	p-value	Pre	Post	Change	p-value	Pre	Post	Change	p-value	
BTCV 2010a (N=136, uBA)	% reporting increase*	NR	NR	47.06	NR	NR	NR	50.00	NR	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	Weak
	% reporting decrease*	NR	NR	38.24	NR	NR	NR	36.76	NR	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	
Wilson 2009 (N=77, uBA)		45.06	45.79	0.73	0.37	46.96	46.80	-0.16	0.56	72.70	73.70	1.00	0.93	70.10	71.80	1.70	0.81	52.40	54.70	2.30	0.54	Weak
Yerrell 2008 (N=194, uBA)		51.55	52.42	0.87	p>0.05	50.17	48.50	-1.67	p>0.05	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	Weak
		Vitality				Mental health				Role physical				Social function				Role emotional				Quality of evidence (EPHPP)
		Pre	Post	Change	p-value	Pre	Post	Change	p-value	Pre	Post	Change	p-value	Pre	Post	Change	p-value	Pre	Post	Change	p-value	
BTCV 2010a (N=136, uBA)	% reporting increase*	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	Weak
	% reporting decrease*	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	
Wilson 2009 (N=77, uBA)		51.90	55.50	3.60	0.22	62.70	68.80	6.10	0.15	70.90	67.50	-3.40	0.19	65.90	62.70	-3.20	0.34	68.20	67.00	-1.20	0.19	Weak
Yerrell 2008 (N=194, uBA)		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	Weak

* Calculated by review team
NR: Not reported

Of the six studies included in the synthesis using SF-36 or SF-12, only one study (Yerrell 2008) reported potential improvement across any of the measured domains (PCS-12).

BTCV 2010a (uBA, n = 136) compared the PCS-12 and MCS-12 baseline measures to those four weeks after EECA participation. A selection criterion for inclusion in the sample was a score of below 50 at baseline (these people were considered most likely to benefit from the programme). Little or no changes were observed.

The woodland-based activities examined by Eastaugh 2010 (uBA, n = 8) were run for two days per week for six months. Little or no change was observed between baseline and six months later across any of the measured domains of SF-36.

Compared to baseline (Reynolds 1999a (uBA, n = 16)), Green Gym participants reported improvements in two of the SF-36 domains assessed six months later: general health perception (mean pre-intervention score: 65, mean post-intervention score: 71.33), and role limitation due to physical functioning (mean pre-intervention: 63.33, mean post-intervention: 83.33) however given the small sample size the robustness of this result is questionable. The authors state that other components measured did not show changes post-intervention however the data were not reported.

Compared to baseline, Small Woods 2011a (uBA, n = 7), reported improvement in total score, PCS-36, MCS-36 and the Social domain 12 weeks later. The robustness of this finding in such a small study is questionable.

Compared to baseline, Wilson 2009 (uBA, n = 77) reported little or no differences in any of the SF-12 domains compared to the measures taken 12 weeks later after participation in EECA.

Yerrell 2008 (uBA, n = 194) used SF-12 at baseline and 12 weeks later after EECA participation. The intervention may improve scores on the PCS-12 (P = 0.043, pre-intervention mean = 51.55, post-intervention mean = 52.42). However, there may also be change in the mental component score, indicating an increase in mental stressors (P = 0.011, pre-intervention mean = 50.17, post-intervention mean = 48.50).

Other QoL measures

Figure 8

Figure 8. Differences in other quality of life measures reported in quantitative studies (studies are ordered alphabetically)

Outcomes		Measure		Comparative impact/ associations		p-value	Quality of evidence (EPHPP)
				Intervention group/ (Env Volunteers: Pillemer)	Control/ (Other Volunteers: Pillemer)		
Pillemer et al. 2010 (N=2630, Cohort)	Self-reported general health	Subjects' responses to: 'All in all, would you say your health is excellent, good, fair, or poor	Model 1 (β)*	0.54	0.87	p>0.05	Weak
Townsend et al. 2005 (N=102, Case-control)	General health and wellbeing	Healthy - Unhealthy'		1.7	1.9	p=0.028	Weak
	General health and wellbeing	High level of wellbeing - low level of wellbeing		1.4	1.7	NS	Weak
	General health and wellbeing	Annual visits to GP		2	2.9	p=0.013	Weak
	General health and wellbeing	Take prescription drugs		2.5	2.7	NS	Weak
	General health and wellbeing	Experience pain and discomfort		2.4	2.6	NS	Weak
	General health and wellbeing	Require assistance in the community		1	1.1	NS	Weak
	General health and wellbeing	Utilise life skills		1.4	1.8	p=0.001	Weak
* Model 1 controlled for age, gender, education and marital status at baseline							
NS: Not significant							

Two studies included used alternative QoL measures to the SF-36/12, (Townsend 2005 (uBA, n = 102), Pillemer 2010 (RC, n = 2630)).

Townsend 2005 (CC, n = 102) compared the QoL of those participating in land management groups with other volunteers. Results using a five-point Likert scale to assess "level of well-being", "taking prescription drugs", "experiencing pain or discomfort", or "requiring assistance in the community", show there may be little or no differences. However the Landcare group reported being "healthier" (land management group mean 1.7 (SD 0.47), control 1.9 (SD 0.50) (P = 0.028)), making "less annual visits to their GP" (land management group mean 2.0 (SD1.0), control 2.9 (SD1.2) (P = 0.013)), and "utilising life skills" (land management group mean 1.4 (SD 0.53), control 1.8 (SD 0.53) (P = 0.001)).

The analysis conducted by Pillemer 2010 (RC, n = 2630) found a reduced likelihood of reporting fair/poor health 20 years later amongst environmental volunteers in comparison to people undertaking different types of volunteering (environmental volunteers, OR 0.54, 95% CI (0.30-0.98) /other volunteers, OR 0.87, 95% CI (0.70-1.09), P < 0.05). However the temporal association in this retrospective cohort study is not known.

5. Additional outcome

Physical activity measures

Figure 9

Figure 9. Changes and differences in additional (physical activity) outcomes reported in quantitative studies (studies are ordered alphabetically)

Study	Outcomes	Measure	Comparative impact/associations				Uncontrolled impact (uBAs)*	p-value	Quality of evidence (EPHPP)
			Model 1*		Model 2**				
			Environmental Volunteering (β)	Control/ Other volunteers (β)	Environmental Volunteering (β)	Control/ Other volunteers (β)	Mean increase in physical activity (mins)		
Pillemer et al. 2010 (N=2630, Cohort)	Physical activity	Four point scale: Frequency of active sports, swimming or long walks, walking in the garden, doing physical exercises	0.088	0.041	0.088	0.041	NA	p>0.001	Weak
Wilson 2009 (N=77, uBA)	Physical activity	Scottish Physical Activity Questionnaire	NA	NA	NA	NA	258	p=0.03	Weak
* Model 1 controlled for age, gender, education and marital status at baseline									
** Model 2 controlled for model 1 varaibles, plus social isolation, chonic condition and functional impairment at baseline									

Two of the ten included studies examined the physical activity levels of participants; Wilson 2009 (uBA, n = 77); Pillemer 2010 (RC, n = 2630). Both relied on self-reports of physical activity; with Wilson 2009 (uBA, n = 77) using the validated Scottish Physical Activity Questionnaire while Pillemer 2010 (RC, n = 2630) used a scale created for the study.

Compared to their baseline measures, participants in the Wilson 2009 (uBA, n = 77) study reported an increased level of activity 12 weeks later after participating in EECA (+ 258 minutes over the last seven days, t-test result: t(69) = -3.14; P = 0.003).

The retrospective cohort study by Pillemer 2010 (RC, n = 2630) used a four-point scale to measure levels of physical activity, asking participants to report the frequency of active sports, swimming, long walks, working in the garden, and physical exercise. After adjusting for levels of physical activity in 1974, both volunteering in the environment and other (non-environmental) types of volunteering were statistically significantly associated with levels of physical activity in 1994. Examination of linear regression beta coefficients (β) suggests that environmental volunteering was a stronger predictor of physical activity than other types of volunteering (β:0.088 environmental volunteers, β:0.041 other volunteers, P < 0.001) when controlling for age, gender, education, and marital status in 'model 1'. The difference was also reported when controlling for confounders in model 1 (age, gender, education, and marital status at baseline) plus social isolation, chronic condition, and functional impairment at baseline (β 0.088 environmental volunteers, β: 0.041 other volunteers, P < 0.001).

Social outcomes

Figure 10

Figure 10. Differences in additional (social measures) outcomes reported in quantitative studies

Study	Outcomes		Measure	Landmanagement group mean	Control mean	p-value	Quality of evidence (EPHPP)
Townsend et al. 2005 (N=102, case-control)	5. Social measures	Safety	Feel safe in area'	1.0 (SD0.27)	1.3 (SD0.53)	0.001	Weak
"		Community Cohesion Scale, Buckner	Attracted to living or being involved in this area	1.2 (SD 0.49)	1.5 (SD 0.54)	0.040	Weak
"		Community Cohesion Scale, Buckner	Sense of belonging to community	1.4 (SD 0.72)	1.7 (SD 0.68)	0.010	Weak
"		Community Cohesion Scale, Buckner	Visit friends	1.7 (SD 1.0)	1.8 (SD 0.92)	NR	Weak
"		Community Cohesion Scale, Buckner	Friends in this community that mean a lot	1.5 (SD 0.79)	1.4 (SD 0.73)	NR	Weak
"		Community Cohesion Scale, Buckner	I would like cease my involvement	4.7 (SD 0.74)	4.4 (SD 0.85)	NR	Weak
"		Community Cohesion Scale, Buckner	When referring to community, use the term "we" rather than "they"	1.9 (SD 0.92)	1.9 (SD 0.87)	NR	Weak
"		Community Cohesion Scale, Buckner	If need advice can ask people in community	1.4 (SD 0.64)	1.8 (SD0.84)	NR	Weak
"		Community Cohesion Scale, Buckner	Agree with most people around here about what is important in life	2.6 (SD 1.2)	2.1 (SD 0.82)	NR	Weak
"		Community Cohesion Scale, Buckner	People in this community would help in an emergency	1.3 (SD 0.56)	1.4 (SD 0.61)	NR	Weak
"		Community Cohesion Scale, Buckner	Sense of loyalty to this community	1.6 (SD 0.88)	1.6 (SD 0.72)	NR	Weak
"		Community Cohesion Scale, Buckner	Borrow things and exchange favors with people here	2.0 (SD 1.1)	2.2 (SD 1.1)	NR	Weak
"		Community Cohesion Scale, Buckner	Willing to work with others to improve this community	1.3 (SD 0.62)	1.8 (SD 0.89)	0.005	Weak
"		Community Cohesion Scale, Buckner	Plan to remain involved with this community	1.5 (SD 0.64)	1.7 (SD 0.84)	NR	Weak
"		Community Cohesion Scale, Buckner	Similar to the people who live in this community	2.5 (SD 1.2)	2.0 (SD 0.89)	0.036	Weak
"		Community Cohesion Scale, Buckner	Regularly interact with people in this community	1.8 (SD 0.98)	1.6 (SD 0.75)	NR	Weak
"		Community Cohesion Scale, Buckner	Rarely have people from this community to my house to visit	3.7 (SD 1.2)	3.3 (SD 1.2)	NR	Weak
"		Community Cohesion Scale, Buckner	Fellowship runs deep between me and other people here	2.0 (SD 1.0)	2.0 (SD 0.85)	NR	Weak
"		Community Cohesion Scale, Buckner	Living or being involved in this area gives me sense of community	1.5 (SD 0.73)	1.8 (SD 0.70)	NR	Weak

The only quantitative study included in the synthesis to report outcomes relating to social cohesion was Townsend 2005 (uBA, n = 102), in which variables were derived from Buckner's community cohesion scale. The scale ranged from one to five, with higher scores being more positive. Differences between the participants in a land management group and the control group were investigated and little or no difference was reported across: "visiting friends", "friends in this community that mean a lot", "I would like to cease my involvement in the community", "use the term 'we' when referring to the community", "can ask advice of people in the community", "agree with most people about what is important", "people would help in an emergency", "sense of loyalty", "borrow things and exchange favours", "plan to remain involved", "regularly interact with people", "rarely have people from community to visit", "fellowship runs deep", and "living here gives me a sense of community".

Differences were reported by Townsend 2005 (uBA, n = 102) across other variables (scaled 1 - 5, with, unlike previously, 5 the worst scoring): "feeling safe in the area" (land management group

mean 1.0 (SD 0.27), control 1.3 (SD 0.53) (P = 0.001)), "attracted to living or being involved in the area" (land management group mean 1.2 (SD 0.49), Control 1.5 (SD 0.54) (P = 0.040)), "sense of belonging to community" (land management group mean 1.4 (SD 0.72), Control 1.7 (SD 0.68) (P = 0.010)), "willing to work with others to improve this community" (land management group mean 1.3 (SD 0.62), Control 1.8 (SD 0.89) (P = 0.005)), and "similar to the people who live in this community" (land management group mean 2.5 (SD 1.20), Control 2.0 (SD 0.89) (P = 0.036)).

Negative outcomes

Across all the outcomes described above, two studies reported negative outcomes of participation. Townsend 2005 (uBA, n = 102) reported that those involved in land management groups reported a higher incidence of feeling anxious than the control group, whereas Yerrell 2008 (uBA n = 194) reported participants experienced a decrease in the mental component score of SF-12 suggesting worse mental health status.

Summary

Figure 11 summarises the main findings for included quantitative studies. Findings are shown in five columns, one for each of the broad outcome domains described in this section: physiological; mental and emotional; quality of life; physical activity; and social. Each row shows one of the included studies and each arrow represents a single outcome measure reported by that study. Green vertical arrows indicate a (reported) statistically significant positive change or associations for participants in EECA, red vertical arrows indicate a (reported) statistically significant negative change or associations, and black horizontal arrows indicate no (reported) statistically significant difference. Arrows shown in brackets are SF-36/12 domains (these are highlighted because they were deemed to be robust and reliable measures), and those cells shown in a bold outline represent other objectively measured or well validated (i.e. published, peer-reviewed validation) measures.

Figure 11. Summary of findings, quantitative studies (studies are ordered alphabetically)

	Barton et al. 2009 (uBA): UK	BTCV 2010a (uBA): UK	Eastaugh et al. 2010 (uBA): UK	O'Brien et al. 2008 (uBA): UK	Pillemer et al. 2010 (Cohort): Canada*	Reynolds 1999a (uBA): UK	Small Woods 2011a (uBA): UK	Townsend et al. 2005 (Case-control): Australia*	Wilson 2009 (uBA): UK	Yerrell 2008 (uBA): UK	Total of participants
Physiological outcomes (see Appendix 8)						↑→→→→ →→→→					16
Mental and emotional outcomes (see Appendix 8)	→→			↑	↑→			↑↓→→	→		2916
Quality of life outcomes (see Appendix 8)		(→→)	→(→→→)		↑	(↑↑→→→→ →→)	→→(→→→ →→→)	↑↑↑→→→→	→→(→→ →→→→→ →)	↑↓	3170
Physical activity outcomes (see Appendix 8)					↑↑				↑		2707
Social outcomes (see Appendix 8)								↑↑↑↑↑→→→ →→→→→→→ →→→→			102
Quality of studies	Weak	Weak	Weak	Weak	Weak	Weak	Weak	Weak	Weak	Weak	

Key:
↑ Statistically significant positive change/associations
→ No statistically significant difference
↓ Statistically significant negative change/associations
↑ Positive change reported in N<20 studies
() - Domains of the SF36/12 measure
*Controlled study
- Objective measure or well validated scale

Notes:
a) Each arrow represents a single outcome measure.
b) The two N of 1 case-control studies (Brooker and Brooker 2008; Brooker and Brooker 2008a) are not included in the synthesis due to study design issues.
c) Pillemer model looking at difference between green volunteering and other vol. based on logistical regression – sig if adjusting for age/ sex and marital status at baseline. Not if adjusting for social isolation, chronic condition, functional impairment at baseline.

All included studies had high risk of bias. Four of the studies contained fewer than 20 participants. Few studies used controlled designs, eight of the ten used uncontrolled before and after measures. In addition, few studies used validated or objective outcome measures, or either of these. No study reporting statistically significant positive outcomes was undertaken using a controlled design and objective measures. This limits the robustness of these findings.

Assessment of outcomes by subgroup

The synthesis examines all interventions as a single group, as described previously, due to the heterogeneity of the included quantitative studies (under the heading of EECA), according to factors such as design, measures used and populations considered, and because of poor reporting (e.g. of intervention characteristics) formal subgroup analysis was not possible. Even where the same outcome measures were used (such as SF-36 and SF-12) in comparable populations, selective reporting meant that different domains were reported in different studies. Further we were not able to formally and meaningfully compare studies according to theory.

Only one study undertook any subgroup analyses (gender and age). Townsend 2005 (CC, n = 102) compared results from those participating in land management groups with other types of volunteers (using a scale with range 1 - 5, with higher scores being more negative, indicating increased mental stress/less satisfaction). Men participating in the land management groups had the highest reported levels of health and well-being (mean 1.6 P = 0.042), they also visited the doctor less often than female members and male or female controls (mean 1.9 P = 0.004). Male land management participants may have higher levels of satisfaction with daily activities than female members or male/female controls (Mean 1.6 P = 0.003). No other differences by gender were reported across the 10 remaining variables tested.

There may be a difference in general health amongst 45 to 64 year olds (land management mean 1.8, control mean 2.0, P = 0.017) in comparison to those in the control group. Land management participants over 75 years of age reported less pain and discomfort than those in the control (means: 2.2/3.1, P = 0.008). Land management participants in age groups 25 to 44 years (means 1.0/1.5, P = 0.015) and 45 to 64 years (means 1.0/1.4, P = 0.017) reported feeling safer in the community than the equivalents in the control group. No other differences by age were reported.

Variation according to specific criteria

As formal subgroup analysis was not appropriate we tabulated studies according to three criteria and narratively explored for possible differences in findings.

- Participants who were reported as 'referred to' activities in comparison to those who appeared to be more 'traditional volunteers'.
- Studies where participants were reported to have some level of mental ill health against those where no such conditions were reported.
- Formal branded programmes such as the 'Green Gym' in comparison to other programmes.

Studies grouped by referral status

Three included quantitative studies (BTCV 2010a (n = 136); Eastaugh 2010 (n = 8); Wilson 2009 (n = 77)) included participants who were reported as referred in some way, however there were no changes in reported outcomes before and after the intervention.

Studies grouped by mental health status

Similarly, studies grouped by participants experiencing mental ill health (BTCV 2010a; Eastaugh 2010; Reynolds 1999a; Small Woods 2011a; Wilson 2009; Yerrell 2008) also show no marked difference in outcome or effect. This may largely be a function of the combined lack of information around the participants, the activity and outcomes.

Studies grouped by formal 'branded' programmes such as Green Gym

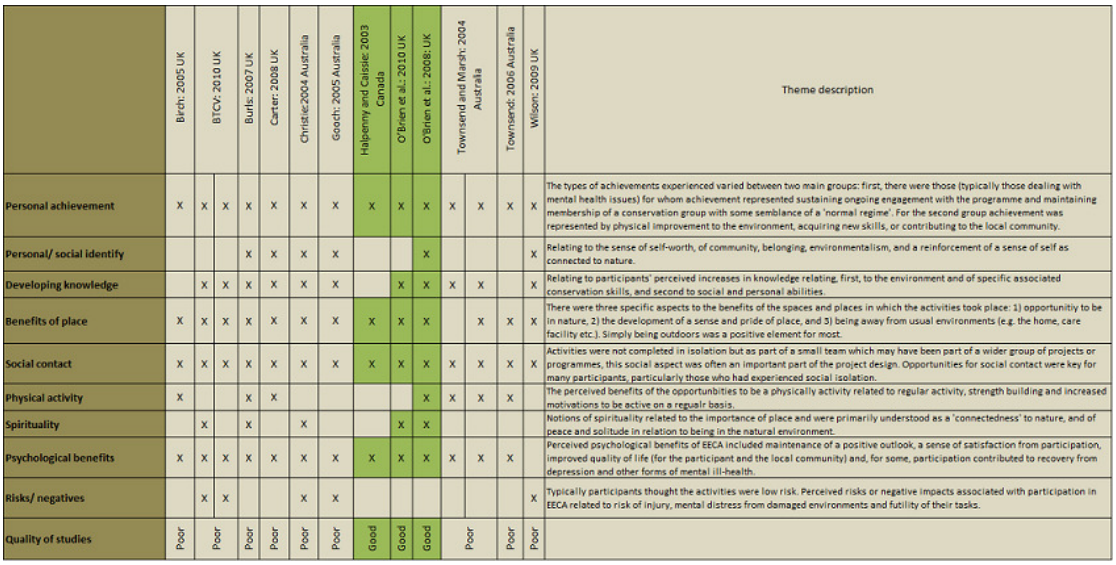
We grouped quantitative studies based on their use of formal programmes of activities: Green Gym in the UK (Barton 2009; BTCV 2010a; Reynolds 1999a; Yerrell 2008) and Australian Landcare (Townsend 2005). There was no marked difference in the reported outcomes between branded and non-branded programmes.

Our exploration of studies by subgroups are represented in images accessible here: http://wp.me/p31J6p-6C.

Qualitative study evidence

The quality of the qualitative evidence was mainly poor, with all but three studies failing to meet the essential Wallace criteria. These three studies (Caissie 2003; O'Brien 2008a; O'Brien 2010a) were rated as 'good'. We have not excluded poor studies as we felt they contributed important and rich data. All themes apart from risks or negative impacts were supported by at least one good quality study and four (personal achievement, benefits of place, social contact, and psychological benefits) were supported by all three good quality studies; and the poor studies provide evidence in support of these. Figure 12 illustrates which studies contributed to each theme (and the associated quality assessment) and is intended to show the commonalities between studies.

Figure 12. Presence of qualitative themes in studies



	Birch: 2005 UK	BTCV: 2010 UK		Burls: 2007 UK	Carter: 2008 UK	Christie:2004 Australia	Gooch: 2005 Australia	Halpenny and Caissie: 2003 Canada	O'Brien et al.: 2010 UK	O'Brien et al.: 2008: UK	Townsend and Marsh: 2004 Australia		Townsend: 2006 Australia	Wilson: 2009 UK	Theme description
Personal achievement	x	x	x	x	x	x	x	x	x	x	x	x	x	x	The types of achievements experienced varied between two main groups: first, there were those (typically those dealing with mental health issues) for whom achievement represented sustaining ongoing engagement with the programme and maintaining membership of a conservation group with some semblance of a 'normal regime'. For the second group achievement was represented by physical improvement to the environment, acquiring new skills, or contributing to the local community.
Personal/ social identify				x	x	x	x			x				x	Relating to the sense of self-worth, of community, belonging, environmentalism, and a reinforcement of a sense of self as connected to nature.
Developing knowledge		x	x	x	x	x	x		x	x	x	x		x	Relating to participants' perceived increases in knowledge relating, first, to the environment and of specific associated conservation skills, and second to social and personal abilities.
Benefits of place	x	x	x	x	x	x	x	x	x	x		x	x	x	There were three specific aspects to the benefits of the spaces and places in which the activities took place: 1) opportunity to be in nature, 2) the development of a sense and pride of place, and 3) being away from usual environments (e.g. the home, care facility etc.). Simply being outdoors was a positive element for most.
Social contact	x	x	x	x	x	x	x	x	x	x	x	x	x	x	Activities were not completed in isolation but as part of a small team which may have been part of a wider group of projects or programmes, this social aspect was often an important part of the project design. Opportunities for social contact were key for many participants, particularly those who had experienced social isolation.
Physical activity	x			x	x					x	x	x	x		The perceived benefits of the opportunities to be a physically activity related to regular activity, strength building and increased motivations to be active on a regualr basis.
Spirituality		x		x		x			x	x					Notions of spirituality related to the importance of place and were primarily understood as a 'connectedness' to nature, and of peace and solitude in relation to being in the natural environment.
Psychological benefits	x	x	x	x	x	x	x	x	x	x	x	x	x		Perceived psychological benefits of EECA included maintenance of a positive outlook, a sense of satisfaction from participation, improved quality of life (for the participant and the local community) and, for some, participation contributed to recovery from depression and other forms of mental ill-health.
Risks/ negatives		x	x			x	x							x	Typically participants thought the activities were low risk. Perceived risks or negative impacts associated with participation in EECA related to risk of injury, mental distress from damaged environments and futility of their tasks.
Quality of studies	Poor	Poor		Poor	Poor	Poor	Poor	Good	Good	Good	Poor		Poor	Poor	

Whilst many of the impacts and processes through which the benefits of EECA were perceived to be achieved were inherently interlinked:

"It's the combination of being outside, with other people, doing something that is caring for the earth…" (Participant Birch 2005),

We identified ten key cross-cutting themes, some of which had one or more sub-themes:

1. Physical activity:
   i) opportunity to be active;
   ii) health gain from activity; and
   iii) physical recuperation.
2. Benefits of place:
   i) being in nature;
   ii) being away from usual environments; and
   iii) the development of a sense and pride of place.
3. Spirituality
4. Developing knowledge:
   i) conservation skills; and
   ii) transferable and employment skills.
5. Personal achievement:
   i) adherence to the programme and life skills; and
   ii) contribution to the environment and society.
6. Personal/social identity:
   i) a sense of self-worth;
   ii) sense of place and belonging within a community; and
   iii) environmentalism and a reinforcement of a sense of self as connected to nature.
7. Mental health and psychological benefits:
   i) structured activities;
   ii) flexible approach; and
   iii) altruism.
8. Social contact:
   i) reducing social isolation;
   ii) relaxed social interaction; and
   iii) neutral spaces.
9. Risks and negative impacts:
   i) perceptions of minimal risk; and
   ii) well-informed futility.

We have described the findings relating to each of these themes below.

Physical activity

Seven studies, including one good quality study, specifically discussed the perceived benefits that participation in EECA could have in terms of opportunities for physical activity across the studies and activity types: Birch 2005; Burls 2007; Carter 2008; O'Brien 2008a (good quality); Townsend 2004; Townsend 2006; Wilson 2009. In the interviews and focus groups held by Townsend 2006 (n = 80) and Townsend 2004 (n = 18) participants associated membership of conservation volunteering groups with increased levels of physical activity. Indeed for some environmental volunteers the opportunity for activity was a primary motivation:

"I was advised to get exercise, so here I am." (Participant, O'Brien 2008a (n = 88))

While these motivations might have been expected in those referred to the activities through health services, it was also found in other studies where participants could be considered the more

'traditional' type of volunteer, for example Townsend 2006 (n = 80). The conservation activities were also felt to be more engaging and interesting than other forms of exercise, perhaps aiding adherence to an exercise referral:

"The value of undertaking practical, outdoor, work was highlighted. This was felt to be rewarding compared to activity in a gym, for example." (Author, BTCV 2010a (n = 19))

For the offenders in the study by Carter 2008 (n = unknown) taking part in EECA provided an invaluable opportunity to be physical active:

*"Access to a gym is rare for prisoners; access to nature is even rarer. Those taking part in the schemes often comment how good it feels to be outside in the fresh air, and to be physically active throughout the day." (*Author, Carter 2008 (n = unknown)

Also of importance was the notion that participation in EECA was a route to better health through these increased levels of physical activity. All three respondents in the study by Birch 2005 (n = 3) reported that they felt that taking part in Green Gym provided them with the opportunity to improve their health through this increased activity. The participants reported that the activity was linked to increased stamina, fewer injuries and reduced stress.

"I feel exhausted...but it's a de-stress ."(Participant, Birch 2005 (n = 3) review team ellipsis)

The participants in the studies undertaken by Burls 2007 (n = 11) and O'Brien 2008a (n = 88) also reported similar notions of increased physical health through higher levels of physical activity, levels of activity that were greater and potentially more varied than would have been undertaken without EECA:

"This is a superb way of keeping relatively fit. The physical is important, it's the buzz, tree felling it's a bit of a man's thing. Generally we want to get on and we are out there for the physical. It's good for muscle tone and keeping the beer off the belly." (Participant, O'Brien 2008a(n = 88)).

Weight loss, amongst other benefits, was also of importance to a participant, who had been referred to the programme by social and mental health services, in the Scottish 'Branching Out' programme:

"I feel it's actually benefited my health, because I do suffer from asthma. It seems as if I'm getting more fresh air and I feel a wee bit healthier and plus some of the work that they dae. I feel that, in a way it is making me lose a wee bit of weight. I used to be twenty stone now I'm only eighteen." (Participant, Wilson 2009 (n = 29)).

Physical activity was one of the key mechanisms though which the participants felt they benefited from engagement with EECA leading to increased fitness, weight loss, lowered stress and increased muscle strength. Positive attitudes were found across all user groups and activity types, but were, predictably, a particularly important focus of those taking part in the 'Green Gym' type activities.

Physical recuperation

Linked, but distinct in the descriptions given by participants, was the notion of physical recuperation as an effect of EECA. For a minority of participants there was a recuperative element, whereby the speed of a return to a state of better health, following a period of illness, was felt to have increased as a result of participation. Studies involving both 'traditional' volunteers and those who had been referred to the programme for health reasons all reported findings that related to a notion of recuperation, Birch 2005 (n = 3), Burls 2007 (n = 11), O'Brien 2008a (n = 88) and Townsend 2004 (n = 18):

"Yes, I feel much better, not just physically but mentally as well... it's just so positive to get on and do something." (Participant, Birch 2005 (n = 3) review team ellipsis).

There was, however, little discussion as to how exactly this recuperative element came about, though it may have been related to the associated findings discussed elsewhere in this section, including increased social contact and exercise, participation in socially valued activities and so on. Only the BTCV 2010a (n = 19) study offered explanatory detail, with respondents feeling that the recuperative benefits were linked to the physical activity, the formally structured day and the meaningful activities. Importantly the participants were also able to better manage health damaging behaviours:

"keeps my mind occupied and off the booze for a few hours" (Woman participant, BTCV 2010a (n = 19)).

This suggests that engagement with meaningful activities benefited this participant, if only because it provided a positive alternative to more damaging behaviours.

Benefits of place

The benefits of the space and places in which the activities took place was a key theme and was present in all included qualitative studies, including all three good quality studies. There were three specific aspects: 1) being in nature, 2) the development of a sense and pride of place, and 3) being away from usual environments. The impacts of contact with natural environments were particularly important and simply being outdoors was a positive element (O'Brien 2008a (n = 88) good quality). Several of the participants in the study by Burls 2007 (n = 11)) described multiple values of being in nature, including:

"the beauty has a calming effect." (Participant, Burls 2007 (n = 11)).

For others the benefits of being in a natural space related to a perception of a cleaner environment (Townsend 2004 (n = 18)), and for others the variety of natural life was important:

"I don't think there is anything more enjoyable than being out in the fresh air with nature, you never know what you're going to see, what you're going to bump into" (Participant, Burls 2007 (n = 11)).

These opportunities to be in nature were motivational and helped maintain adherence to the projects (Caissie 2003 (n = 10) good quality). There was also the suggestion that contact with the nat-

ural world helped give participants a broader perspective of the world and their place within it. Burls 2007 (n = 11) argued that the new and intimate connection with nature allowed the participants to develop the feeling they were part of something fundamental; a cycle of growth, of nature and life:

"Taking care of our environment and feeling that we are part of it; some level of power and energy" (Participant, Burls 2007 (n = 11)).

Some respondents stated that their sincere relationship with nature and the local place in which the activity was undertaken was both a motivator and outcome of participation (Burls 2007 (n = 11)). Regular work in, and care for a particular environment resulted in a strong sense of place and attachment:

"When we pass round that roundabout and see those trees growing it's very rewarding. I can see that I've done my little bit for the environment. I live around here - I intend to come back" (Christie 2004 (n = 18)).

Many had a broad vision for the conservation of the environment and participation in EECA provided a route through which to contribute and something to be proud of (Christie 2004 (n = 18)). A participant in the study undertaken by Gooch 2005 (n = 85) argued that there was a clear need for someone to take a stand and protect the environment of her local community:

"The biggest thing for me when I came here was meeting like-minded people. It feels good to give something that nobody else is prepared to give" (Participant, Gooch 2005 (n = 85)).

For many, especially those who had experienced various forms of marginalisation, deprivation and, perhaps, institutionalisation, the benefits of place were associated with 'being away':

"[It is] a chance to get people out into a green space, it's very different to all of the environments in mental health services elsewhere, day centres are just not going to have this kind of atmosphere." (Group leader/participant, Burls 2007 n = 11)).

This sentiment was echoed by Wilson 2009 (n = 29) study of the impacts of the Branching Out programme:

"It's been very therapeutic I think - all the different sights and sounds and smells is very different from the hospital environment that I'm used to, you know and the city environment of course, and I've really enjoyed being out in the countryside." (Participant, Wilson 2009 (n = 29))

However, more broadly, and for participants who had not been referred to the programme for health reasons, being away from normality, from urban living or from the everyday day stresses and strains of working life was important (Burls 2007 (n = 11), O'Brien 2008a (n = 88), Townsend 2004) (n = 18)).

Spirituality

Notions of spirituality were reported in studies by BTCV 2010a (n = 19), Burls 2007 (n = 11), O'Brien 2008a (n = 88, good quality) and O'Brien 2010a (n = 10, good quality). This related to the previous theme (the importance of place) and was primarily understood as a connectedness to nature:

"On a personal level participants found their relationship with nature facilitating spiritual growth. Finding solace in nature." (Author, O'Brien 2010a (n = 10)).

The notions of peace and solitude in relation to being in the natural environment were common to each of the reports that considered spirituality. Christie 2004 (n = 18) reported participants feeling part of the land in which they were engaged and that was the single greatest motivator for being involved and outcome of engagement.

Developing knowledge

Eight of the 12 included qualitative studies (including two good quality studies) reported results relating to participants' perceived increases in knowledge of the environment, not only of more specific associated conservation skills, but also in relation to social and personal abilities.

The immediate impact of participation in EECA on knowledge gain could be found in the development of the skills necessary to carry out the EECA effectively, through knowledge of what to do, how and when to do it. For instance:

"Improved confidence was felt to be linked to enhanced knowledge about how to use tools properly." (Author, BTCV 2010a (n = 19)).

This immediate acquisition of relevant skills improved self-confidence and appeared to contribute to the positive impacts of participation. Participants in studies by Burls 2007 (n = 11), Carter 2008 (n = unknown), Christie 2004 (n = 18), Gooch 2005 (n = 85), O'Brien 2008a (n = 88, good quality), Townsend 2004 (n = 18), and Wilson 2009 (n = 29), reported increases in their knowledge of nature and the environment.

"I get a better understanding of the river system in doing it. I get a better understanding of the whole environment…and it stimulates me." (Participant Gooch 2005 (n = 85) review team ellipsis).

This acquisition of knowledge directly contributed to one participant's enjoyment of the activities:

"I've loved the activities, you know, finding out about the trees and, and you know, the plants and things. I love all that." (Participant, Wilson 2009 (n = 29)).

In some cases the knowledge gained was more widely applicable beyond the EECA programmes. For instance, one of the major themes emerging from the analysis by O'Brien 2010a (n = 10, good quality) was the development of transferable employability skills alongside the more sociable and physical benefits. Burls 2007 (n = 11) also noted that participants, some of whom received unemployment benefits, felt more positive about their employment prospects as a result of taking part in the programmes. Benefits to wider skills such as increased vocabulary and team working were highlighted. Similarly, the participants in the study by BTCV 2010a (n = 19) who also had mental health issues, received practical training in environmental conservation. The participants highlighted the specific nature of the knowledge gained, for example using soil rather than concrete to erect fencing, and how this had led them to question how they undertook other tasks. Partic-

ipants also received a certificate of proficiency, which was a major achievement, and increased confidence as well as demonstrating their knowledge of conservation techniques:

"Developing new perspectives was also central, and this in turn led to some volunteers studying for qualifications in conservation. A proportion of the volunteers had been unemployed for some time and so the structure and activity of the sessions was beneficial. Skills learned also contributed to feelings of enhanced employability." (Author, BTCV 2010a (n = 19)).

Learning ranged from specific tool use to broader knowledge of nature and the environment, as well as how to function as part of a team to achieve a goal.

Personal achievement

All of the included qualitative studies reported this complex category, and therefore all three good quality studies. There were two main focuses to the discussions reported: first, there were those studies (usually those where mental health issues were a factor) in which respondents were engaging as a means of recuperation, and second, those in which participation in environmental improvement was the motivating factor. The types of achievement valued and experienced by the participants varied between these two groups.

In the first group, the richest and most pronounced reports of achievement came from projects dealing with individuals experiencing mental ill health (BTCV 2010a (n = 19), Wilson 2009 (n = 29) particularly). Achievement came about through the provision of, and then adherence to the daily structure of the programme, thereby increasing motivation and ability to engage in activities and, finally, the impact that completing the activities had:

"The very fact of participation was an achievement in itself for some volunteers. Depression and linked illnesses can limit daily activity and so for some to get dressed and attend was significant." (Author, BTCV 2010a (n =19)).

"Aye it's been great I've thoroughly enjoyed it, Aye. I wouldn't say I've been great at it. I've tried it anyway; I've came along and tried it. I wasn't too good at it (willow weaving) but at the end I done it. At least I tried … I feel in myself I've achieved something … Like see when I gae home after leaving here I'm puffed oot and I feel as if I've achieved something. I'm knackered and I'm quite proud of myself cause I've done it." (Participant, Wilson 2009 (n = 29) review team ellipsis)

For these people the sense of achievement focused, at least initially, less on the nature of the activity undertaken, rather through attempting and adherence to the programme. It was considered to be a progressive and reinforcing process, with some participants developing the self-confidence and the skills to re-enrol as team leaders after successful completion. This was seen as significant progress and achievement and, perhaps, shows developing commitment to the actual activities involved.

The second group of people for whom achievement was important were those seeking to improve the environment, particularly those engaged with the Australian Landcare movement and other associated programmes (Christie 2004 (n = 18), Gooch 2005 (n = 85), Townsend 2004 (n=18), Townsend 2006 (n=80)). For these participants it was primarily the environmental impact which was important, however some individuals reported that this led to a negative feeling of futility when activities resulted in little or no impact (Christie 2004 (n = 18)).

Related to this, were those who found benefits accrued through taking part in socially or environmentally valuable activities. For some, environmental enhancement and conservation activities provided an opportunity to 'give something back' Christie 2004 (n = 18). This was of particular importance for those who felt they had drawn on societal resources, or who had a strong environmental ethic:

"Our work is beneficial to nature; for the benefit of the birds; we create an environment for wildlife; we've got trees established now, probably some of them are 25 feet tall; it's not just this plot of land, it's not just for these birds and this wildlife but it's for the people as well; for other people to look at in years to come; greater understanding of plants, nature and ecology; regeneration; the birds have somewhere to nest, the frogs have somewhere to spawn, it makes the world go round." (Participant, Burls 2007 (n = 11))

This category seemingly exists on a continuum of personal achievement: with completing structured daily activities (which, for some, amounted to getting out of bed) at one end, and impacting on global environmental troubles at the other, and as the last quote illustrates, these impacts were interconnected with many of the other themes discussed here.

Personal/social identity

Six of the included studies (including one good quality study) discussed the impact that participation in EECA had on individuals' sense of personal and social identity, and related to the sense of self-worth, of community, belonging, environmentalism, and a reinforcement of a sense of self as connected to nature (Burls 2007 (n = 11); Carter 2008 (n = unknown); Christie 2004 (n = 18); Gooch 2005 (n = 85); O'Brien 2008a (n = 88, good quality); Wilson 2009 (n = 29).

Carter 2008 (n = unknown), in a study of offenders, examined the impact that environmental work had on participants' integration into society. Participants discussed the notion of re-building a sense of self-worth and identity through engaging in EECA, during which they came into contact with non-offenders, and through which they felt they were making a direct contribution to society. Of particular importance was the sense of being trusted, to be out and talking to the public, which although difficult for some of the individuals, was felt to contribute to the process of de-stigmatisation and development of self-esteem:

"It's nice feeling part of, ehm, part of society again." (Participant, Carter 2008 (n = unknown)).

Similarly, volunteers in an Australian stewardship programme, some of whom had mental health issues, noted the importance of rebuilding a positive social identity through the group based on meaningful and collaborative activities (Burls 2007 (n = 11). Contact with the public was also noted to be important for these individuals.

The results reported by Christie 2004 (n = 18) differed from those of Carter and Burls in that respondents, who were conservation volunteers, focused more on environmental outcomes and their contribution to them. Participants reported that their sense of identity was linked to the impact they were having on environmental issues. Similarly Gooch 2005 (n = 85), who reported on the impacts of a catchment volunteering programme, found that developing and maintaining an environmentalist identity and having an impact on nature was valued:

"The study suggests that the social identity formed by members of a particular group contributes to a sense of belonging, responsibility, values and emotions." (Author, Gooch 2005 (n = 85)).

Comparison of the results from Burls 2007 (n = 11) and Carter 2008 (n = unknown) demonstrates an apparent difference in impact between different user categories: for the marginalised groups, the meaningful activities facilitated the rebuilding or maintaining of a "normal" identity, this was articulated by those who may have felt they had been defined by illness or status (for instance as a 'prisoner' or 'depressed'), while for others the activities allowed the participants to demonstrate and validate their "environmentalist" identities.

There were several other ways in which participation had an impact on identity. A number of the respondents interviewed by O'Brien 2008a (n = 88, good quality) highlighted the role of participation in maintaining a positive self-identity post retirement. While for others in the study, particularly those who had struggled to find paid work, volunteering contributed to their sense of self-worth and status.

The role of the activities in enabling a continuation of a sense of self as connected to nature, a notion which had developed in childhood, was also identified by both O'Brien 2008a (n = 88, good quality) and by Wilson 2009 (n = 29):

"Ah, well I've always enjoyed the outdoors. But since I've became not well, it's just as if I've been housed. Just locked up in the house which is not me. So this was a chance to get out, get fresh air, some exercise and do something for the community and that." (Participant, Wilson 2009 (n = 29)).

Through engaging with meaningful activities that were seen to be valuable socially and environmentally, individuals had access to resources (personal, social and cultural) which allowed them to develop more positive self-identities.

Other mental health and psychological benefits

The myriad of perceived psychological benefits of EECA, aspects of which were also reported in all of the included qualitative studies (and therefore all three good quality studies), was strongly associated with each of the other themes. The impacts of achievement, for instance, were strongly linked to the positive emotions of accomplishing something, whether it was getting out of bed for someone suffering from depression, or, for a committed environmentalist, in making a real difference to an environment. This category encompasses discussions by participants on a range of mental benefits of participation in EECA including emotional response, quality of life or recovery from depression. Impacts could be multiple. For example, the respondents in the study by Wilson 2009 (n = 29) spoke about feeling more confident, having improved self-esteem, and better overall mental well-being.

The structure provided by repeated involvement with programmes of activities was again raised as having a central psychological effect, particularly for those experiencing some level of mental ill health or those at risk of social isolation (Birch 2005 (n = 3), BTCV 2010a (n = 19), and Wilson 2009 (n = 29) most markedly).

"it's getting me out the house and to me that in itself is a task, but it's a task worth doing, you know. I like to see the fruits of my labour." (Participant, Wilson 2009(n=29)).

The type of work which was undertaken in this structure was also important. Whilst it was physically (and occasionally emotionally) demanding work, it was also un-pressurised and flexible, which was important to respondents. Furthermore, being able to see the tangible impact of what was achieved appeared to motivate participation.

Related, though markedly different, were the impacts felt by the groups of participants who considered involvement in EECA to be altruistic. For this group, psychological benefits were accrued through the leaving of a legacy for future generations (Christie 2004 (n = 18) and Gooch 2005 (n = 85)). Indeed, one of the respondents in the study by Gooch 2005 (n = 85) referred to EECA participation as empowering.

"Basically giving something back to nature because I've taken a lot from it." (Participant, Caissie 2003 (n = 10, good quality)).

As the individuals interviewed by Caissie 2003 (n = 10, good quality) had taken trips solely for the purpose of environmental enhancement it is not surprising that altruism was a major theme; respondents wanted to give something back to the environment.

Social contact

The theme for which there was most frequent and rich description in the included qualitative studies was social contact. All included qualitative studies (and so all three good quality studies) reported themes relating to this, and there was little variation in content across different participant groups. From the studies, it appears that the activities were not completed in isolation but as part of a small team, which may have been part of a wider group of projects or programmes. Where descriptions of the projects were available, they showed that many aimed to harness the benefits of social contact.

There were clearly groups for which opportunities for social contact had greater impact; those experiencing previous isolation through mental ill health (BTCV 2010a (n =19), Wilson 2009 (n = 29)), and retirees (O'Brien 2008a (n = 88, good quality)) all reported benefits in terms of improved social networks. For these groups contact with other people had a positive effect and was seen as part of the recovery process:

"It helped me get out the house and meet people and join in the activities a bit more. I don't know if you're aware, I had depression, I wouldn't go out at all, I mean it's about a year ago, I wouldn't go out at all…" (Participant, O'Brien 2010a (n = 10, good quality)).

An important aspect of this was the unforced, relaxed nature of the social contact. Additional factors included undertaking shared activities, collaborative learning and companionable interactions.

"Everybody seems to get on and muck in together and if somebody was struggling you'd try to help them along…" (Participant, Wilson 2009 (n = 29)).

The neutrality of the setting and social contact was important for some:

"We all get on very well it's quite a close band of people. There's no hidden agenda; you don't need to know who the people are or what they do. You just come [and] enjoy the day that's the beauty of it." (Participant, O'Brien 2010a) (n = 10, good quality)).

Findings reported from the study of offenders in nature (Carter 2008 (n = unknown)) indicated that, for this group, it was seen as an achievement to be part of the general public without being verbally abused or derided, and engagement with visible improvements to the local natural environment enabled them to accomplish that. Participation had additional outcomes in the potential to facilitate positive re-engagement with family members:

"One offender, after a few weeks on the scheme, took his father out to show him the work he had completed. "It's nice feeling part of, ehm, part of society again" " (Participant, Carter 2008 (n = unknown))

The social contact through taking part in EECA also allowed individuals to develop wider support networks and to meet new people. In some cases the friendships were strong enough to encourage people to meet outside of the formal activity programme. For others, social contact was more focused on a coming together of like-minded people with the purpose of improving the environment (Christie 2004 (n = 18), Caissie 2003 (n = 10, good quality), Gooch 2005 (n=85)).

Whilst subtly different to those at risk of isolation, the effect of social contact was no less frequently reported.

Risks and negative impacts

Very few included qualitative studies (and no good quality studies) reported any perceived risks or negative impacts associated with participation in EECA. Some even argued the potential risks were minimal:

"No more than normal life risks; only risks you put yourself in, but not other than that; it could happen in life anyway; it's safer than me riding my bike on the road." (Author, Burls 2007 (n = 11)).

Christie 2004 (n = 18) examined the experiences of Australians enrolled on a peri-urban environmental regeneration scheme and reported limited feelings of 'well-informed futility', amongst some participants. This sense of pointlessness came about when they realised the extent of the perceived problem and their in/ability to make a meaningful impact through activities. Similarly, Gooch 2005 (n = 85) reported some aspects of negative feeling associated with water-catchment restoration in Australia, where participants felt that their input was not sufficient and that more needed to be done. In this case a more positive connotation was reported, with individuals citing motivating future generations and sustainability of action as motivators to continued participation:

"There's a need here, I don't enjoy this [volunteering] at the moment, I must admit it. It's...it's killing me, but I've got to keep going, there's just too much at stake." (Participant, Gooch 2005 (n =85) review team ellipsis).

In both cases these participants were volunteers motivated to take part through their deeply held environmental concerns. Their focus on the significant challenges to the environment may have been greater than for those whose motivations were more modest.

Overall the included qualitative studies provided rich descriptions of the ways in which health and well-being impacts *were perceived* to have accrued. In those studies including potentially marginalised groups the programme characteristics which are the defining features of EECA (such as team activities and flexible but structured days) were argued to be of benefit. Conversely, studies including more environmentally-focused individuals reported that participants found value in being able to take local actions to address to global problems.

DISCUSSION

Summary of main results

While the qualitative research evidence identified positive experiences and a range of perceived health and well-being benefits, the quantitative studies, which were few in number and of weak quality, suggested little or no impact on the outcomes of interest.

Quantitative evidence results and limitations

The quantitative evidence base is sparse, and weak for five main reasons.

- Lack of robust study design. Few studies used controlled designs, eight of the ten used uncontrolled before and after measures.
- Small sample size. Four studies contained fewer than 20 participants.

- Choice and application of outcome measures. Few used validated or objective outcome measures.
- Selection bias.
- Inadequate and inconsistent reporting of results.

Synthesis of findings across the included studies was compromised by the use of a number of different outcome measures, whilst even those using the same measures reported on heterogeneous populations or applied the measure in substantially different manners. This, together with lack of comparative study designs and poor reporting of sample characteristics, precluded subgroup analyses. We found little quantitative evidence of positive or negative effects of participation in environmental enhancement and conservation activity, for any measured outcome. There was limited evidence of positive effect on outcomes in some studies, as well as some (also limited) evidence of negative effects. Most outcomes, however, were not statistically significant or were inconsistent. Of those few studies that did report statistically significant findings, none used both a controlled study design and objectively measured outcomes.

Qualitative evidence findings and limitations

The qualitative research also suffered from inadequate reporting of key details such as sample characteristics and recruitment methods. The qualitative evidence provided rich descriptions of the perceived potential mechanisms of effect (i.e. how benefits were thought to accrue), as well as participant motivations and experiences of taking part in EECA. The qualitative findings focused more on the potential pathways to health and well-being rather than on actual impact in terms of outcomes; although physical and mental health was directly discussed in a small number of studies. We identified ten themes in the qualitative data, describing the experience of EECA and perceived routes to health and well-being benefit.

Limitations relevant to both quantitative and qualitative evidence

The evidence base, quantitative and qualitative, was almost entirely located in grey literature, so a significant proportion of the studies were not academic, peer-reviewed studies. Such programme evaluations may not be as methodologically rigorous as peer-reviewed studies and may also be subject to increased levels of reporting bias, which has implications for our ability to make claims about the impacts of participation in EECA.

In addition, such studies were potentially subject to conflicts of interest. The majority of included studies (10/19, 53%) appeared to be funded or supported by organisations promoting the use or protection, or both, of the natural environment, and three were written by authors working for the organisation providing the intervention. Two authors appear as authors or co-authors on six of the included studies. There were no studies where the funder was both known and unlikely to have a potential conflict of interest. The prevalence of such internal evaluations is due to the limited resources, both time and financial, available to researchers in this field and the relative infancy of the field itself. The primary aim of much of the research conducted was as an internal evaluation of the programme. As no studies were included which were assessed as free from this potential bias we were unable to assess the impact on results.

All the interventions met our inclusion criteria provided in Types of interventions, however there was insufficient reporting detail to allow exploration of findings by intervention specifics.

The activities explored in the research were predominantly rural, in open countryside, woodland, nature reserves, with some urban based projects. Whilst we searched for literature from any OECD country, we only found studies which met the inclusion criteria from the UK, US, Australia, and Canada. Most of the included activities were undertaken in the participants' local area, with only Caissie 2003 (n = 10) including volunteer tourists. We identified three main types of project in which participants were engaged: environmental focused (e.g. Landcare, Townsend 2005), environment and health focused (e.g. Green Gym, Barton 2009; BTCV 2010a; Reynolds 1999a; Yerrell 2008), and health interventions (e.g. Wilson 2009 (n = 77/29)). The frequency and time frame of participation was poorly reported, however weekly activities lasting between two and four hours was repeatedly mentioned. Time since baseline measurements were reported in eight studies and ranged from three weeks to months, allowing limited conclusions to be drawn about any longer term outcomes.

Included participants were of a broad range of age groups and backgrounds, although demographic data were poorly reported. Some participated in activities as volunteers and some participants had been referred onto programmes. A number of studies included participants who had, or were currently experiencing mental ill health. One study included offenders.

The use of theory in included studies was inconsistent and was often applied uncritically. Grouping of study findings by theoretical background was not possible, however the less formal lay theories (programme theories articulated by participants and activity organisers) helped develop our conceptual framework. The conceptual framework illustrates the range of interlinked mechanisms through which people believe they have potential to achieve the health and well-being benefits of EECA, such as enhanced opportunities for social contact. It also considers potential moderators and mediators of effect, such as participant motivation, or nature of activities.

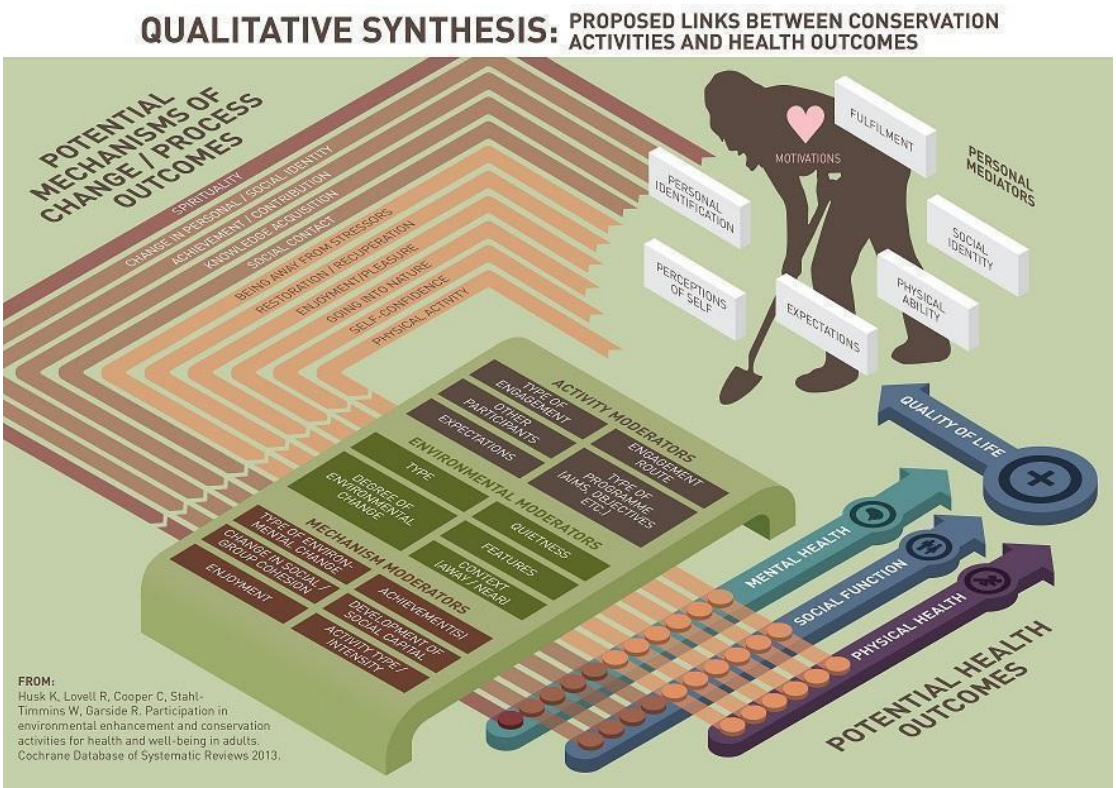
Conceptual framework

A key outcome of our synthesis was the development of a conceptual framework to illustrate the proposed ways through which health benefits might be accrued by taking part in conservation activities. To develop this framework, we used the participants' perceptions from qualitative studies, the authors' interpretations

of the overall evidence, the programme theories described in the studies and input from both reference groups. Our initial conceptual framework was refined through this input (see Data synthesis). The evidence collected supported differing ways to well-being, linking with barriers, facilitators, and outcomes through interventions, thus the first iteration of the model provided a good base. Studies included in the review indicated that it was lacking in both detail and structural nuance, however. Detail, in that each set of characteristics (well-being features, barriers, facilitators, outcomes) needed extension and amendment through detailed thinking. Structure, in that the linearity of the original model did not represent the cyclical, somewhat complex nature of intervention effect reported (i.e. feedback loops and process outcomes). Therefore, during the synthesis, we revised and extended all aspects of this draft model. We devised a new framework that emerged from the qualitative evidence base. We used all studies to inform about participant characteristics and range of activities as a way to understand what possible moderators and mediators might be (a version with study identifiers populating our links can be seen here: http://wp.me/p31J6p-6C). Our initial model was an expression of the project reference groups' discussion of the most likely mechanisms and impacts prior to the review, and so the second phase is also an illustration about how plausible theories in this field are or are not substantiated by empirical evidence.

The final version is shown in Figure 13. The model represents the authors' interpretation of the overall data and is intended to represent the range of potential pathways through which health impacts may come about. It is also an illustration about how plausible theories are or are not supported by empirical evidence. Emphasis was placed on the presence of mechanisms rather than on the evidential strength which, given the types and quality of the evidence available, seemed most applicable. Further, the model does not represent commonality between the studies. This version was designed in conjunction with a data visualisation specialist (WST), and circulated amongst the two advisory groups for further comments.

Figure 13. Final conceptual framework (Qualitative Synthesis: Proposed Links Between Conservation Activities and Health Outcomes), representing potential health and wellbeing impacts from participation in EECA.



The model proposes the range of pathways through which health and well-being impacts may come about following participation in environmental enhancement and conservation activities; it tries to capture a programme theory (i.e. how it is believed that health and well-being impacts may come about through participation in EECA). It also shows aspects relating to participants and activity types that may cause variation in the mechanisms or the outcomes experienced, or both.

In the model, "moderators" refers to factors which the qualitative evidence suggested might influence the extent to which outcomes or mechanisms are experienced by participants. Three types of moderators were identified as of potential importance; first, the mechanisms of action; second, the environment in which an activity is undertaken (e.g. rural vs urban); and third, those that related to the types of activity itself (e.g. who it was undertaken with, and for what purpose).

"Personal mediators" refer to those factors, such as personal expectations and physical ability, which the qualitative evidence suggested were potentially of relevance and which may influence the outcomes. We placed motivation separately because it emerged as a key factor as to how people approach and potentially benefit from the programme.

The pathway shown in the model in a dark red colour (spirituality) is only thought to influence mental health, while the orange/brown pathways are those that might influence both mental health or social function, or both, and the orange pathways might influence any or all of the three outcomes.

It should be noted that there is no evidence of tangible health impacts for six months following participation in EECA from all available evaluations. As noted above, self-selection of participants introduces high levels of bias into all included quantitative and qualitative studies, and so what is presented is also subject to these possible biases. The model is built from a small body of heterogenous evidence, the majority of which was rated as 'poor' (all but three of the qualitative studies). Therefore, the model does not illustrate proven pathways to impact, rather the range of potential ways in which participation may impact on health. It shows how participants in the studies believed they were deriving benefit from the activities in which they were involved and that factors that could influence the nature and extent of the effects.

The model tries to capture complexity, and is not specific to any particular population. Instead it is designed to illustrate that factors such as a person's motivation, the place in which the activity takes place and the purpose of the activity could affect the types of outcomes achieved. Some of these outcomes are particularly difficult to measure, such as confidence or spirituality, and no evidence of effect was reported in quantitative studies. This could be because there is no effect, but may also relate to the studies being small and of poor quality, or even because the wrong outcomes were measured.

The health related 'outcomes' in the model are broadly those that we stated we would assess in the review protocol. The circularity of the model is used to demonstrate that participation is likely to be a process over time subject to variation and feedback loops and, therefore, any outcomes, or processes possibly leading to outcomes, are neither strictly linear nor independent of each other. An example of a feedback loop was identified in the qualitative evidence which suggested that increased social contact led to improvement in a participant's confidence which resulted in further opportunities for social contact, ability to take on leadership roles and so on.

The 'mechanisms of change/process outcomes' were derived from the qualitative evidence and demonstrate some of the proposed pathways through which the health-related outcomes appear to be related to the environmental enhancement and conservation activities. Many of the process outcomes could also be considered to be important potential impacts. For example, increased opportunities for physical activity may lead to improved physical and mental well-being, but is also a desirable process outcome in itself. The mechanisms of change and process outcomes are broad categories and many have several sub-themes that it was not possible to show on the model.

Overall completeness and applicability of evidence

Completeness

Quantitative studies

We found evidence relating to all of the outcome groups described in the protocol apart from physical health, and we grouped outcomes according to broad domain. There was, however, only a small number of studies and those included in the synthesis were heterogenous and of poor quality (see Quality of the evidence). The evidence base would be greatly improved with the addition of independently funded, controlled studies which were comprehensively analysed and reported (see Implications for research).

One study examined the physiological impacts of participation in EECA (Reynolds 1999a (n = 16)). There was no evidence of significant effect of EECA participation in any physiological measures.

There were three studies which identified positive associations between EECA participation and mental and emotional outcomes. O'Brien 2008a (n = 88) reported an increase in the self-reported emotional state of participants post intervention, Townsend 2005 (n = 102) saw an increased level of satisfaction with daily activities amongst land management group members compared to controls, and Pillemer 2010 (n = 2630) reported a 50% reduction in the odds of reporting being depressed amongst environmental volunteers when compared to controls. Townsend 2005 (n = 102) reported an increased incidence of feeling anxious amongst the land management group compared to controls. Again, we are unable to examine processes of causation given the nature of the

evidence base. It is difficult to make an assessment of the association between mental and emotional well-being, and participation in EECA, due to the quality of the evidence.

Whilst the majority of the evidence reported for quality-of-life outcomes showed no evidence of effect we found some positive and negative outcomes. The most commonly reported quality of life outcomes were the SF-36 and shortened SF-12 measures; positive associations were reported on the "general health perception", and "role limitation due to physical functioning" sections by Reynolds 1999a (n = 16), and the physical component summary score by Yerrell 2008 (n = 194). A negative association was reported between EECA participation and the mental component score of SF-12 (Yerrell 2008 (n = 194)). Other quality-of-life measures also showed some positive associations, between EECA participation and "feeling healthy", "annual visits to the GP", "utilising life skills" by Townsend 2005 (n = 102). Self-reported health status was found to be better amongst EECA volunteers when compared to other volunteers by Pillemer 2010 (n = 2630, not an intervention study).

Of the other outcomes included in the protocol, alongside the primary health and well-being outcomes, the included studies only reported physical activity and social cohesion measures. The two studies that considered the impact of EECA on physical activity outcomes reported positive results. Wilson 2009 (n = 77)) assessed time spent on physical activity (using the Scottish Physical Activity Questionnaire (Lowther 1999)) and Pillemer 2010 (n = 2630, not an intervention study)) used a measure created to examine the frequency of active sports. The lack of controlled, randomised evidence means that we can only conclude that there may be some association between participation in EECA and levels of physical activity.

Results relating to social cohesion were reported by Townsend 2005 (n = 102) who showed that (compared to the control group) membership of a land management group may be associated with feeling "safer in the local area", "attracted to living in the area", "a sense of belonging to the community", "willing to work with others" and "being similar to others in the community".

Interventions examined

All included activities met the inclusion criteria of being those which were intended to improve the outdoor natural or built environment at either a local or wider level; take place in urban or rural locations; involve active participation; are entirely voluntary, or not; and are NOT experienced through paid employment. The activities undertaken by the 'environmental volunteers' in the non-intervention study by Pillemer 2010 also met these criteria. As outlined previously there was a lack of detailed reporting relating to interventions; for instance basic information such as the intensity and duration of interventions was largely missing. Additionally, the timing of follow-up assessments varied greatly (from three weeks to six months).

We expected to locate evidence relating to a broad range of activities (see Types of interventions). From what we can ascertain from the poor reporting of intervention specifics only two activities that we anticipated finding evidence on, were not examined; 1) litter picking and 2) re-greening in built environments. Whilst we identified studies which included these specific activities and which were methodologically includable (see Austin 2002 and Vachta 2002), no health outcomes were reported.

We were unable to draw any conclusions about any variation in particular types of activities' impact on health and well-being. We were also unable to draw conclusions around the impact of level of physical activity (i.e. high or low), which would have been of interest had data been available.

Participant groups examined

The included studies assessed the outcomes of participation in EECA on adults. The socio-demographics of the participants were poorly reported. Where reporting allowed for an assessment it appeared that the studies considered a range of groups, including conservation volunteers, retired people, people in receipt of support from the social and health services, environmental tourists and men leaving the prison system.

We were unable to perform formal sub-group analyses because of the poorly reported studies, heterogeneity in outcome, and selective use of measures. Included studies often provided an age breakdown for included individuals, but outcomes were not reported for separate groups. In the conceptual framework we have tried to capture the potential for these subgroups to have different experiences and motivations through personal mediators.

Qualitative evidence

The included qualitative studies were largely of poor quality. The qualitative evidence from these studies greatly increased the completeness of the review; the consideration of how people experienced participation revealed the underlying mechanisms through which participants felt EECA impacted on their health and well-being. These studies provided evidence that addressed the differing ways in which particular groups might derive benefit from participation.

Overall, the quantitative and qualitative evidence we located addressed the majority of the categories of outcome, intervention and participant which we had anticipated. However we were unable to differentiate between sub-groups, activities and outcomes. This limited the completeness of the review and impacted on the conclusion we were able to draw.

Applicability

As discussed previously, whilst meeting our inclusion criteria, the studies were heterogeneous (activity specifics, outcomes and measures) and poorly reported. This has prevented us from drawing any firm conclusions about the impact of particular activities on particular groups of people. In this developing field there is a need for methodologically rigorous and comprehensively reported studies in order to assess fully the effects of different interventions.

Where reporting allowed assessment, it appeared that outcome data were collected immediately following a period of participation in EECA (see Risk of bias in included studies). We were therefore unable to conclude how durable the impacts of EECA may be, further limiting the applicability of the findings.

The qualitative evidence synthesis indicated that socially excluded groups were those who potentially accrued greatest benefit from EECA and so it is perhaps these groups to which the findings of the review are particularly applicable. Features of interventions highlighted by these groups as addressing key health and social problems (e.g. daily structure, employability skills, social contact) are therefore potentially of use in programmes addressing health inequalities more broadly. Indeed, the rich descriptions of the mechanisms provided by participants in included studies demonstrated the need for careful consideration of process outcomes and outcomes in any study addressing equity issues.

The types of conservation and environmental enhancement activities that were addressed in the included studies (see Types of interventions) share commonalities with those of related projects and programmes such as communal gardening and urban re-greening. It is feasible that the impacts of EECA and the programme theory, shown in the conceptual framework, may be applicable to these other related types of activities. The mechanisms of action which may be common to these other programmes include physical activity, being in nature, gaining skills, being away from stressors, and undertaking a communal, goal-orientated and rewarding activity.

Finally it should be noted that the evidence base was limited to English-speaking, largely Western nations and so there is potentially limited applicability to other global communities.

Quality of the evidence

Please refer to Risk of bias in included studies for a summary. A detailed risk of bias table for each included study is provided in Characteristics of included studies.

All quantitative studies were rated as weak. The primary reason studies were considered to be of poor quality was a lack of reported detail. For example, it was often impossible to tell how participants had been selected or what activity was undertaken. Selection bias was a central problem for all studies; certain projects noted the difficulty in keeping people enrolled (e.g. BTCV 2010a). It is likely that samples were therefore biased towards those who voluntarily completed the programmes (i.e. those most committed) experiencing benefits.

Quantitative evidence used less robust study designs, being mostly uBAs, and even in those with stronger designs the comparator or control selection was either unclear or not rigorously conducted. Follow-up periods, where data was supplied, were largely the length of the intervention, typically between three and six months, and so we could not draw any conclusions about the sustained effect of participation.

A further issue which affected the assessment of the reliability of the studies was the publication of results from a single study in more than one location. Results were often written up in part across a number of papers and had to be located and collated into a single data extraction. Lack of clarity in reporting participants and methods made this task difficult.

Overall, the quality of the included quantitative evidence was relatively weak. We did not find any randomised controlled evidence, and the majority of included quantitative studies were uBAs, limiting the resulting findings to associations between EECA and health and well-being. We could not uncover any causal processes, nor could we unpick the contributory factors to the observed outcomes (e.g. time spent in the outdoors, social contact, or of the actual activities themselves). All included quantitative studies suffered from detection bias as participants could not be blinded to the intervention.

The qualitative evidence was also weak, with three rated as 'good' (Caissie 2003; O'Brien 2008a; O'Brien 2010a) and the rest (Birch 2005; BTCV 2010a; Burls 2007; Christie 2004; Carter 2008 (n=unknown); Gooch 2005; Townsend 2004; Townsend 2006; Wilson 2009) as 'poor'.

Potential biases in the review process

One of the key difficulties of this review was defining what was included and excluded in terms of activities. The definition we settled on (see Types of interventions) was the most appropriate given a reading of the literature, the scope of the review and to avoid cross-over with related reviews (G. Chabot et al., CPHG review). We also sought and attained the project reference group's agreement that the activities we included were relevant and appropriate, however some ambiguity remains which may have led to (what may appear as) unclear inclusion and exclusion of closely related activities (e.g. gardening). Where activities were questionable we discussed inclusion as a team and reported our reasoning (see Characteristics of included studies).

The project reference group had also expected the review to locate more European evidence, thus highlighting a potential geographical bias. However none were identified during either the grey searches or the bibliographic searches. Given the prevalence throughout Europe of English as the primary language of scientific publication it is likely that this is because EECA is simply not undertaken to the same extent as in the UK (also suggested by one of the referees for the protocol for this review).

We conducted searches in October 2012 and updated them in October 2014. We did not conduct any further searches due to financial and time constraints. We were unable to search CAB Direct, OpenGrey, SPORTDiscus, and TRIP Database in update searches (conducted in October 2014) due to changes in institutional access. Our searches were biased toward the UK, this was due to the resource costs of direct contact with organisations. We were realistically unable to replicate this level of contact outside the UK (despite comprehensive top-level website trawls) and this is, we believe, reflected in the location of studies by country of origin. This, combined with the lack of evidence located in the database searches, means that an element of bias towards UK organisational reports is introduced. We accept that there is likely to be significant evidence from elsewhere in the world which is not included.

Our approach to identifying grey literature, largely completed through telephone conversations and web searches, was unusual but particularly useful in gaining information. We could not realistically have reproduced this process across multiple countries, and certainly not across multiple languages.

The poor reporting and unpublished nature of many studies relating to EECA meant that we excluded a number of potentially eligible studies due to lack of the specific information (in relation to the location and specifics of activities, methodologies etc.) necessary to clarify whether they met the inclusion criteria. We tried to contact authors and source further data in relation to these potentially includable studies.

Given the complexity of the interventions and outcomes, the equivocal nature of the results of studies, and despite applying a language search limit, we feel that the results of the review were unlikely to have been different and would have reflected the complexity and uncertainty in the identified evidence base.

Agreements and disagreements with other studies or reviews

To our knowledge there are no systematic reviews which examine the impact of environmental enhancement and conservation activities on health and well-being in adults. We are unable to draw firm conclusions from the evidence collected, however we feel that existing primary studies examining EECA overstate the evidence base and discuss promising but unproven mechanisms, something which we recommend extending below.

AUTHORS' CONCLUSIONS

Implications for practice

The evidence in this review is limited and somewhat conflicting; there is some indication that for some people participation in environmental enhancement or conservation activity impacts positively on health and well-being, but also that some participants may experience increased mental strain. Any benefits are complex and not obvious; whilst often not central features of programmes, real benefits appear to be seen in the normalisation and daily structure of activities (which are task related) for some groups.

The quality of the evidence base is one of the main findings of this review. There were a small number of studies which were of poor quality and often not well reported. Studies were mostly uncontrolled, and subject to high levels of bias, as well as often being conducted internally or funded by the provider. Qualitative studies were also of a low overall quality and lacked reporting detail.

There was therefore insufficient evidence to draw conclusions about participation in specific activities by specific groups of individuals, but given the type and quantity of the evidence it is the potential mechanisms of action which were of most interest. The qualitative synthesis enhances understanding of the processes by which any effects might occur. This evidence suggested that individuals experiencing social isolation or mental ill health might gain greatest benefit. The social, structured nature of the enjoyable tasks was reported as being key for these individuals, rather than the health outcomes themselves.

Projects engaging volunteers, or referrals, with EECA could therefore seek to maximise opportunities to enhance these pathways to maximise health impacts. Projects could also take into account the motivations of participants - such as provision of day structure, and even attendance - when formulating activities, and recognise that outcomes differ for differing groups. Additionally, for those referred groups, GPs and mental health workers might consider the appropriateness of referral in more cases given the outcomes identified as important, such as increased self-esteem, social contact and day structure.

More broadly, the mechanisms proposed in our conceptual framework (Figure 13) (arising from the qualitative evidence base) might relate to activities which are not EECA focused. Any interventions which are group-based, goal-orientated and flexibly-structured might also trigger many of these potential pathways to health. The framework also indicates potential intermediate outcomes that could be measured in future studies (i.e. sense of social contact) and the participants that would appreciate these.

Implications for research

As noted above the evidence located was weak and future research should address the specific methodological problems which we have outlined. Evaluations of programmes should seek to use appropriate intervention study designs, such as randomised controlled designs, which would provide evidence of a causal link between participation and health impacts. Alternatively, realist approaches might elucidate what works, in what circumstances, for whom. Participants and controls should be selected from appro-

priate populations using rigorous sampling, interventions should be documented in detail and outcomes assessed over longer time scales using appropriate validated measures. Less reliance should be placed on self-reported health and well-being measures.

As part of the output of this review we are working with our PRG to develop an evidence toolkit, which will take the form of a single page of recommendations for good practice based on the evidence collected and links to evaluation methods sources.

Our conceptual model represents an illustration of the range of potential pathways through which EECA might influence health and well-being. The wider applicability of the model needs further investigation, refinement and, ultimately, testing. We therefore recommend reviews into linked topics and groups including:

- gardening;
- farm-care;
- horticulture therapy;
- school gardens; and
- Attention Restoration Therapy.

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* *Indicates the major publication for the study*

CHARACTERISTICS OF STUDIES

Characteristics of included studies *[ordered by study ID]*

Barton 2009

Methods	**Study design** Quantitative. uBA **Study period** The research was conducted between September and November 2004 **Timing of intervention** No information was given relating to the timing of the intervention, but given the study design it is likely to correspond to the study period **Sampling** Participants were recruited through personal contacts prior to, and after, participation in Green Gym activities. The authors state a form of cluster sampling **Data collection** A composite questionnaire was administered both before and after the activities, no further information was provided. Two activities were included in the analysis **Analysis process** Analysis was conducted on the reported variables including means and index change analyses. Groups taking part in EECA and those engaged in mountain biking, boating, woodland activities, walking, horse riding and fishing were compared in the analyses. Two includable activities were included in the analysis: conservation volunteering and the Green Gym, which were analysed separately
Participants	**Sample size** n = 19 (Activity 1 consisted of 17 participants and Activity 2 consisted of two participants) **Country, area** UK, England/Scotland/Northern Ireland/Wales, rural. **Sample characteristics** The sample was broken down into the two activities: 1. Conservation volunteering in an Area of Outstanding Natural Beauty (AONB): the participants in this activity were aged between 31-84 (mean 62), and 5 were female. 67% had continued education after the minimum 2. Green Gym: the participants in this activity were aged 27 and 72 (mean 49.5), both were male. Neither of the participants had a degree Overall the sample consisted of 50% ex-smokers, 33% who had never smoked and 13% were current smokers. 87% overall were retired
Interventions	**Intervention description** The two EECA activities which were includable given our inclusion criteria were: 1. conservation volunteer on an AONB, clearing cut grass, scattering seeds, and clearing scrubland 2. Green Gym activity, digging and scrub clearing **Time frame and frequency** The first activity was an all-day (10 am - 4 pm) session, which met twice a week all year round, irrespective of the weather. The second was a 2.5-hour activity and the frequency the volunteers met was not specified **Location in nature**

	The first activity was in open countryside, fells, woodland and the shoreline. The second was held in woodland, open country, community gardens and community farms	
Outcomes	**Mental health** Rosenberg Self-Esteem Scale (RSE), Profile of Mood States (POMS) **Quality of life measures** General Health Questionnaire	
Notes	This research was funded by the Countryside Recreation Network	
Risk of bias		
Bias	**Authors' judgement**	**Support for judgement**
Random sequence generation (selection bias)	Unclear risk	See EPHPP assessment below
Allocation concealment (selection bias)	Unclear risk	See EPHPP assessment below
Blinding of participants and personnel (performance bias) All outcomes	Unclear risk	See EPHPP assessment below
Blinding of outcome assessment (detection bias) All outcomes	Unclear risk	See EPHPP assessment below
Incomplete outcome data (attrition bias) All outcomes	Unclear risk	See EPHPP assessment below
Selective reporting (reporting bias)	Unclear risk	See EPHPP assessment below
Other bias	Unclear risk	See EPHPP assessment below
Wallce Criteria for appraising qualitative evidence	Unclear risk	Not applicable - quantitative study
EPHPP Criteria	High risk	**Component Ratings** ***A) Selection bias*** Q1) Are the individuals selected to participate in the study likely to be representative of the target population? *Somewhat likely* Q2) What percentage of selected individuals agreed to participate? *80% - 100%* **Rating (Section A): Moderate** ***B) Study design*** Indicate the study design: *Before and after* Was the study described as randomised? If NO, go to component C. *No*

		If YES, was the method of randomisation described? If YES, was the method appropriate? **Rating (Section B): Weak** ***C) Confounders*** Q1) Were there important differences between groups prior to the intervention? *Yes* Q2) If YES, indicate the percentage of relevant confounders that were controlled (either in design (e.g. stratification, matching) or analysis)? *60% - 79%* **Rating (Section C): Moderate** ***D) Blinding*** Q1) Was (were) the outcome assessor(s) aware of the intervention or exposure status of participants? *Yes* Q2) Were the study participants aware of the research question? *Can't tell* **Rating (Section D): Weak** ***E) Data collection methods*** Q1) Were data collection tools shown to be valid? *Yes* Q2) Were data collection tools shown to be reliable? *Yes* **Rating (Section E): Strong** ***F) Withdrawals and drop-outs*** Q1) Were withdrawals and drop-outs reported in terms of numbers and/or reasons per group? *No* Q2) Indicate the percentage of participants completing the study. (If the percentage differs by groups, record the lowest). *Can't tell* **Rating (Section F): Weak** ***G) Intervention integrity*** Q1) What percentage of participants received the allocated intervention or exposure of interest? *80% - 100%* Q2) Was the consistency of the intervention measured? *No* Q3) Is it likely that subjects received an unintended intervention (contamination or co-intervention) that may influence the results? *Yes* ***H) Analyses*** Q1) Indicate the unit of allocation. *Organisation* Q2) Indicate the unit of analysis. *Individual*

		Q3) Are the statistical methods appropriate for the study design? *Yes* Q4) Is the analysis performed by intervention allocation status (i.e. intention to treat) rather than the actual intervention received? *Yes* **Global rating for this paper: Weak** Discrepancy between reviewers? *No* Final decision of both reviewers: Weak

Birch 2005

Methods	**Study design** Qualitative. Three-stage research process consisting of participant observation, semi-structured interviews, and the researcher's photo notebooks **Study period** No information was given relating to the research study period **Timing of intervention** The study was completed during participant involvement with the Green Gym, which was measured over four weeks **Sampling** The researcher enrolled onto a Green Gym programme and participants were recruited at the first session, though all had been members for 10 - 14 weeks prior to the study **Data collection** Data were collected in three distinct ways throughout the study: 1. participant observation, the researcher participated in four Green Gym sessions lasting three hours over four weeks; 2. semi-structured interviews, consisting of 10 predetermined questions around joining, attendance and impact of the Green Gym. Interviews lasted around 30 minutes; and 3. participant photo notebooks. Cameras were provided by the researcher and participants asked to take pictures of things which encapsulated what the activity sessions represented to them. The images were later discussed with the participants **Analaysis process** Thematic analysis. The analysis process as described by the study author consisted of data reduction, display and the drawing and verifying of conclusions. Three main elements comprised the first coding: group voluntary work, exercise, and contact with nature. Codes were applied to data which linked these elements revealing thematic clusters. Data were then represented in Venn diagrams, with triangulation achieved from all three stages of the research process. Diagrams were then compared to themes, clusters and data for the emergent conclusions (see outcomes)
Participants	**Sample size** n = 3 **Country, area** UK, South-East England, semi-rural **Sample characteristics** The three participants were aged 39, 42 and 62 years. Two of the three were female. Two of the participants were unemployed and one was a part-time community worker. All had been involved with the Green Gym programme for between 10 - 14 weeks prior to the

	study. One participant had symptoms of Huntington's which had caused depression and inactivity, one had a residual knee-injury, PTSD and weight-gain, and the last reported depression following the death of a family member
Interventions	**Intervention description** A 'Green Gym' programme which consisted of conservation volunteering: clearing brambles, prepping soil for nature gardens, creating vegetable plots, installing a seating area and planting fruit trees **Time frame and frequency** Sessions lasted three hours and were undertaken bi-weekly. Sessions were provided by the British Trust for Conservation Volunteers (now The Conservation Volunteers) **Location in nature** The only information provided states that activities were undertaken in a semi-rural location
Outcomes	**Themes identified** Six main themes were highlighted by the author: exercise at Green Gym can benefit physical health, exercise at the Green Gym can benefit mental health, working with diverse and changeable nature is stimulating, work providing a sense of achievement, work is flexible and un-pressurised, and the social aspects of the Green Gym are positive
Notes	This research was funded by the University of Brighton

Risk of bias

Bias	**Authors' judgement**	**Support for judgement**
Random sequence generation (selection bias)	Unclear risk	Not applicable - qualitative study
Allocation concealment (selection bias)	Unclear risk	Not applicable - qualitative study
Blinding of participants and personnel (performance bias) All outcomes	Unclear risk	Not applicable - qualitative study
Blinding of outcome assessment (detection bias) All outcomes	Unclear risk	Not applicable - qualitative study
Incomplete outcome data (attrition bias) All outcomes	Unclear risk	Not applicable - qualitative study
Selective reporting (reporting bias)	Unclear risk	Not applicable - qualitative study
Other bias	Unclear risk	Not applicable - qualitative study

Birch 2005 (*Continued*)

Wallce Criteria for appraising qualitative evidence	High risk	Is the research question clear? *Yes* Perspective of author clear? *Yes* Perspective influenced the study design? *Yes* Is study design appropriate? *Yes* Is the context adequately described? *Yes* Sample adequate to explore range of subjects/settings? *No (only three participants at one site)* Sample drawn from appropriate population? *Yes* Data collection adequately described? *Yes* Data collection rigorously conducted? *Yes* Data analysis rigorously conducted? *Yes* Findings substantiated/limitations considered? *Yes* Claims to generalizability follow from data? *Yes* Ethical issues addressed? *Yes*
EPHPP Criteria	Unclear risk	Not applicable - qualitative study

Brooker 2008a

Methods	**Study design** Quantitative. Within-subject case-study **Study period** The research was carried out during February 2008 **Timing of intervention** The Green Gym session was undertaken on the morning of the 19th February 2008 and the gym workout was undertaken in the evening of 16th February 2008 and the morning of the 17th February 2008 **Sampling** The sample consisted of one participant, who was one of the research team **Data collection** Data were collected during each activity to assess heart rate response and muscle group use in one individual during physical activity in a conventional gym and in the Green Gym. Heart rate monitoring was used and observations were limited by this technology simply to counting beats per minute. Resistance during strength exercises was measures using total weight lifted **Analysis process** Basic comparative statistics were undertaken, though with the proviso that the study included only one participant
Participants	**Sample size** n = 1 **Country, area** England, Chilterns **Sample characteristics**

	The participant was one of the research team, an experienced and regular gym user and experienced and regular Green Gym volunteer. The participant was 49, female, and worked as an administrator
Interventions	**Intervention description** Three activities were undertaken for this study 1. A Wallingford Green Gym session on the 19th February 2008, held on a gently undulating site on the Natural England reserve at Aston Rowant, which consisted of vegetation clearance (lopping, sawing and dragging/carrying cut material to a collection point for disposal Two 'control' activities: 2. A gym workout in Oxford on the evening of 16 February ("Gym: CV") using an exercise bicycle (Lifefitness 'LifeCycle') regulated by a 'Cardio Programme' which automatically adjusted resistance to achieve a target heart rate determined by the user's age 3. A gym workout in Oxford on the morning of 17 February 2008 ("Gym: strength") using a series of fixed-weight resistance machines pre-programmed by a qualified fitness instructor (Lifefitness 'Dual Pulley Row', 'Shoulder Press', 'Leg Extension', 'Leg Press', 'Leg Curl', 'Lat Pulldown', 'Chest Press', and 'Pectoral Fly') **Time frame and frequency** Three activity sessions were undertaken over a period of four days **Location in nature** Chiltern Hills, the activities were provided by BTCV
Outcomes	**Physiological** Heart rate (Polar chest-strap sensor and wrist strap-mounted receiver and display), and muscle group use (which was determined by external observation, the sensations reported by the participant and information provided by the manufacturers of Lifefitness equipment)
Notes	

Risk of bias

Bias	**Authors' judgement**	**Support for judgement**
Random sequence generation (selection bias)	Unclear risk	See EPHPP assessment below
Allocation concealment (selection bias)	Unclear risk	See EPHPP assessment below
Blinding of participants and personnel (performance bias) All outcomes	Unclear risk	See EPHPP assessment below
Blinding of outcome assessment (detection bias) All outcomes	Unclear risk	See EPHPP assessment below

Incomplete outcome data (attrition bias) All outcomes	Unclear risk	See EPHPP assessment below
Selective reporting (reporting bias)	Unclear risk	See EPHPP assessment below
Other bias	Unclear risk	See EPHPP assessment below
Wallce Criteria for appraising qualitative evidence	Unclear risk	Not applicable - quantitative study
EPHPP Criteria	High risk	**Component Ratings** ***A) Selection bias*** Q1) Are the individuals selected to participate in the study likely to be representative of the target population? *Not likely* Q2) What percentage of selected individuals agreed to participate? *80% - 100%* **Rating (Section A): Weak** ***B) Study design*** Indicate the study design: *Other (n = 1)* Was the study described as randomised? If NO, go to component C. *No* If YES, was the method of randomisation described? If YES, was the method appropriate? **Rating (Section B): Weak** ***C) Confounders*** Q1) Were there important differences between groups prior to the intervention? *Not applicable* Q2) If YES, indicate the percentage of relevant confounders that were controlled (either in design (e.g. stratification, matching) or analysis)? *Not applicable* **Rating (Section C): Weak** ***D) Blinding*** Q1) Was (were) the outcome assessor(s) aware of the intervention or exposure status of participants? *Yes* Q2) Were the study participants aware of the research question? *Yes* **Rating (Section D): Weak** ***E) Data collection methods*** Q1) Were data collection tools shown to be valid? *Yes* Q2) Were data collection tools shown to be reliable? *Yes* **Rating (Section E): Weak**

		F) Withdrawals and drop-outs Q1) Were withdrawals and drop-outs reported in terms of numbers and/or reasons per group? *Not applicable* Q2) Indicate the percentage of participants completing the study. (If the percentage differs by groups, record the lowest).*80% - 100%* **Rating (Section F): Weak** ***G) Intervention integrity*** Q1) What percentage of participants received the allocated intervention or exposure of interest? *Not applicable* Q2) Was the consistency of the intervention measured? *Not applicable* Q3) Is it likely that subjects received an unintended intervention (contamination or co-intervention) that may influence the results? *Yes* ***H) Analyses*** Q1) Indicate the unit of allocation.*Individual* Q2) Indicate the unit of analysis. *Individual* Q3) Are the statistical methods appropriate for the study design?*Yes* Q4) Is the analysis performed by intervention allocation status (i.e. intention to treat) rather than the actual intervention received? *Yes* **Global rating for this paper: Weak** Discrepancy between reviewers? *No* Final decision of both reviewers: Weak

Brooker 2008b

Methods	**Study design** Quantitative. Within-subject case-study **Study period** The study took place over two months in autumn/winter 2008 **Timing of the intervention** The Green Gym sessions occurred on the 18 and 25 November 2008. The 'control' gym activities were undertaken on the 29 and 30 October, 1 2, 3 November 2008 **Sampling** The sample consisted of one participant, who was one of the research team **Data collection** Data were collected during each activity to assess heart rate response in one individual during physical activity in a conventional gym and in the Green Gym. Heart rate monitoring was used and observations were limited by this technology simply to counting beats per minute **Analysis process** Basic comparative statistics were undertaken, though with the proviso that the study included only one participant
Participants	**Sample size** n = 1 **Country, area** England, Chilterns **Sample characteristics** The participant was one of the research team, an experienced and regular gym user and experienced and regular Green Gym volunteer. The participant was 49, female, and worked as an administrator
Interventions	**Intervention description** Seven activities were undertaken for this study 1. A Wallingford Green Gym session on the morning of 18 November, coppicing - sawing small branches, lopping twigs, and dragging/carrying light loads of cut material downhill to a collection point for disposal ("Green Gym: light duties") 2. A Wallingford Green Gym session on the morning of 25 November, coppicing - choosing more challenging options: lopping and sawing larger branches; dragging/carrying heavier material to a collection point uphill ("Green Gym: regular tasks") 'Controls': 3. Normal work and domestic activity at home on the afternoon to evening of 29 October, to establish a baseline ("control") 4. A cross-country run on the morning of 30 October ("run") 5. An all-body workout on the morning of 1 November in a conventional gym, using a Lifefitness cross-trainer machine - 'X-train aerobics' programme ("aerobics") 6. A gym workout on the morning of 2 November, using a series of fixed-weight resistance machines pre-programmed by a qualified fitness instructor (Lifefitness 'Shoulder Press', 'Pectoral Fly', 'Leg Press', 'Leg Extension', 'Leg Curl', 'Chest Press', and 'Lat Pulldown' ("weights")) 7. A cross-country walk on the morning of 3 November ("walk") **Time frame and frequency** Seven activities were undertaken over a period of two months **Location in nature** Chiltern Hills, the activities were provided by BTCV

Outcomes	**Physiological** Heart rate (Polar chest-strap sensor and wrist strap-mounted receiver and display)	
Notes		
Risk of bias		
Bias	**Authors' judgement**	**Support for judgement**
Random sequence generation (selection bias)	Unclear risk	See EPHPP assessment below
Allocation concealment (selection bias)	Unclear risk	See EPHPP assessment below
Blinding of participants and personnel (performance bias) All outcomes	Unclear risk	See EPHPP assessment below
Blinding of outcome assessment (detection bias) All outcomes	Unclear risk	See EPHPP assessment below
Incomplete outcome data (attrition bias) All outcomes	Unclear risk	See EPHPP assessment below
Selective reporting (reporting bias)	Unclear risk	See EPHPP assessment below
Other bias	Unclear risk	See EPHPP assessment below
Wallce Criteria for appraising qualitative evidence	Unclear risk	Not applicable - quantitative study
EPHPP Criteria	High risk	**Component Ratings** ***A) Selection bias*** Q1) Are the individuals selected to participate in the study likely to be representative of the target population? *Not likely* Q2) What percentage of selected individuals agreed to participate? *80% - 100%* **Rating (Section A): Weak** ***B) Study design*** Indicate the study design: *Other (n = 1)* Was the study described as randomised? If NO, go to component C. *No* If YES, was the method of randomisation described? If YES, was the method appropriate? **Rating (Section B): Weak**

		C) Confounders Q1) Were there important differences between groups prior to the intervention? *Not applicable* Q2) If YES, indicate the percentage of relevant confounders that were controlled (either in design (e.g. stratification, matching) or analysis)? *Not applicable* **Rating (Section C): Weak** ***D) Blinding*** Q1) Was (were) the outcome assessor(s) aware of the intervention or exposure status of participants? *Yes* Q2) Were the study participants aware of the research question? *Yes* **Rating (Section D): Weak** ***E) Data collection methods*** Q1) Were data collection tools shown to be valid? *Yes* Q2) Were data collection tools shown to be reliable? *No* **Rating (Section E): Weak** ***F) Withdrawals and drop-outs*** Q1) Were withdrawals and drop-outs reported in terms of numbers and/or reasons per group? *Not applicable* Q2) Indicate the percentage of participants completing the study. (If the percentage differs by groups, record the lowest). *80% - 100%* **Rating (Section F): Weak** ***G) Intervention integrity*** Q1) What percentage of participants received the allocated intervention or exposure of interest? *Not applicable* Q2) Was the consistency of the intervention measured? *Not applicable* Q3) Is it likely that subjects received an unintended intervention (contamination or co-intervention) that may influence the results? *Yes* ***H) Analyses*** Q1) Indicate the unit of allocation. *Individual* Q2) Indicate the unit of analysis. *Individual* Q3) Are the statistical methods appropriate for the study design? *Yes* Q4) Is the analysis performed by inter-

		vention allocation status (i.e. intention to treat) rather than the actual intervention received? *Yes* **Global rating for this paper: Weak** Discrepancy between reviewers? *No* Final decision of both reviewers: Weak

BTCV 2010a

Methods	**Study design** Mixed methods, uBA and a two-stage qualitative element (project officer and volunteer interviews) **Study period** The research was conducted parallel to the intervention, during 2009 **Timing of intervention** The intervention ran for a four-week period during 2009 **Sampling** No information was given relating to the sampling of participants to the quantitative stage of the research. The participants in the qualitative element were recruited through site visits to four BTCV sites, the researchers then spoke to project officers and then volunteers, the authors state a convenience approach **Data collection** Quantitative data were collected through the administration of an SF-12 questionnaire completed pre and post activity (four-week period apart). Qualitative interviews were conducted with project officers and volunteers over the phone (for project officer volunteers) and face to face (for both groups) **Analysis process** Quantitative data were subjected to SF-12 analysis using the BTCV online database. Production of separate scores for physical and mental health components formed part of the analysis. Qualitative data were analysed using framework analysis formed around the interview schedule
Participants	**Sample size** Quantitative element: n = 136 Qualitative element: n = 19 (eight project officer volunteers and 11 volunteers) **Country, area** UK, England at various sites, mostly rural **Sample characteristics** The 11 volunteers in both stages of the research were People with Enduring Mental Disorder (PEMD). No further information is provided on those participating in the quantitative element. The qualitative participants (volunteer PEMD) consisted of eight men and three women, seven were unemployed, one suffered drug and alcohol problems and two were from mental health residential units. Individuals were referred by Mind or similar organisations, or self-referred
Interventions	**Intervention description** Environmental volunteering activity from 28 groups across England as part of the branded 'Green Gym' programme. The included activities such as: clearing invasive species, planting, seeding, working with willow, developing orchards, clearing footpaths,

	dry stone walling, scrub clearance, renovation and uncovering ponds **Time frame and frequency** The activities were undertaken over a four-week period, no other information was given **Location in nature** The activities were undertaken in a variety of settings depending on the group providing the setting
Outcomes	**Quality of life measures** SF-12 (cut down SF-36): those scoring 50 or below on the entry questionnaire were asked to complete the completion questionnaire as they were considered Wellbeing Comes Naturally beneficiaries **Social** Measures developed by the authors were included in the second and subsequent questionnaires relating to social measures **Themes identified** Six main themes emerged from the authors' analysis of the qualitative data: conservation volunteering activities and roles involving PEMDs, physical health benefits, mental health benefits and the benefits of working in a natural environment, challenges and obstacles, finding out about the programme
Notes	This research was funded by the Big Lottery Fund and BTCV.

Risk of bias

Bias	**Authors' judgement**	**Support for judgement**
Random sequence generation (selection bias)	Unclear risk	See EPHPP assessment below
Allocation concealment (selection bias)	Unclear risk	See EPHPP assessment below
Blinding of participants and personnel (performance bias) All outcomes	Unclear risk	See EPHPP assessment below
Blinding of outcome assessment (detection bias) All outcomes	Unclear risk	See EPHPP assessment below
Incomplete outcome data (attrition bias) All outcomes	Unclear risk	See EPHPP assessment below
Selective reporting (reporting bias)	Unclear risk	See EPHPP assessment below
Other bias	Unclear risk	See EPHPP assessment below
Wallce Criteria for appraising qualitative evidence	High risk	Is the research question clear? *No, very vaguely worded* Perspective of author clear? *No, the evalu-*

		ation programme was descriptive rather than critical Perspective influenced the study design? *Yes* Is study design appropriate? *Yes* Is the context adequately described? *Yes* Sample adequate to explore range of subjects/settings? *Yes* Sample drawn from appropriate population? *Yes* Data collection adequately described? *Yes* Data collection rigorously conducted? *Can't tell* Data analysis rigorously conducted? *Yes* Findings substantiated/limitations considered? *No, only descriptions given* Claims to generalizability follow from data? *Yes* Ethical issues addressed? *No, none described*
EPHPP Criteria	High risk	**Component Ratings** ***A) Selection bias*** Q1) Are the individuals selected to participate in the study likely to be representative of the target population? *Somewhat likely* Q2) What percentage of selected individuals agreed to participate? *80% - 100%* **Rating (Section A): Moderate** ***B) Study design*** Indicate the study design: *Before and after* Was the study described as randomised? If NO, go to component C. *No* If YES, was the method of randomisation described? If YES, was the method appropriate? **Rating (Section B): Weak** ***C) Confounders*** Q1) Were there important differences between groups prior to the intervention? *Can't tell* Q2) If YES, indicate the percentage of relevant confounders that were controlled (either in design (e.g. stratification, matching) or analysis)? *Less than 60%* **Rating (Section C): Weak** ***D) Blinding*** Q1) Was (were) the outcome assessor(s) aware of the intervention or exposure status of participants? *Yes*

		Q2) Were the study participants aware of the research question? *Can't tell* **Rating (Section D): Moderate** ***E) Data collection methods*** Q1) Were data collection tools shown to be valid? *No* Q2) Were data collection tools shown to be reliable? *No* **Rating (Section E): Weak** ***F) Withdrawals and drop-outs*** Q1) Were withdrawals and drop-outs reported in terms of numbers and/or reasons per group? *Yes* Q2) Indicate the percentage of participants completing the study. (If the percentage differs by groups, record the lowest). *Less than 60%* **Rating (Section F): Weak** ***G) Intervention integrity*** Q1) What percentage of participants received the allocated intervention or exposure of interest? *80% - 100%* Q2) Was the consistency of the intervention measured? *No* Q3) Is it likely that subjects received an unintended intervention (contamination or co-intervention) that may influence the results? *Yes* **H) Analyses** Q1) Indicate the unit of allocation. *Individual* Q2) Indicate the unit of analysis.*Individual* Q3) Are the statistical methods appropriate for the study design? *Yes* Q4) Is the analysis performed by intervention allocation status (i.e. intention to treat) rather than the actual intervention received? *Can't tell* **Global rating for this paper: Weak** Discrepancy between reviewers? *No* Final decision of both reviewers: Weak

Burls 2007

Methods	**Study design** Qualitative. Four-stage research process consisting of interviews with service users, focus groups and practitioner interviews, quantitative stage not meeting inclusion criteria for this review, and an ethnographic case study. The results for each stage were quoted separately and so the study was deemed includable despite a stage of quantitative research not meeting our inclusion criteria **Study period** No information was given relating to the study period of the research **Timing of intervention** No information was given relating to the timing of the intervention which was delivered **Sampling** Very little information was given relating to the selection of the sample in this study. Participants were recruited from a previous study, however this was not elaborated upon nor detailed **Data collection** The three stages of includable data collection in this study consisted of, firstly, semi-structured interviews with service users. Secondly, focus groups (n = 5) were conducted with participants and practitioners. Lastly, there was an ethnographic case study, consisting of reflexive notes kept by the researcher during a period of participation in the intervention **Analysis process** No information was given relating to the analysis process undertaken
Participants	**Sample size** The three includable stages of this study consisted of sample sizes: 1. not stated 2. n = 10 3. n = 1 (ethnographic) **Country, area** UK, area not specified. **Sample characteristics** No information was given relating to the sample characteristics of those participating in the study. The author states that those included in the first stage of the study were from a vulnerable group and reported a disability, but no more detail was given
Interventions	**Intervention description** Very little information was provided relating to the intervention, the author states that participants, practitioners and the researcher engaged in 'ecotherapeutic activities' **Time frame and frequency** No information was given relating to the time frame and frequency of the intervention **Location in nature** Again, very little information is provided. The author states that activities occurred in 'green spaces'. Activities were provided by the mental health charity Mind
Outcomes	**Themes identified** The author identified seven major themes emerging from the data collected: physical benefits of participation, psychological benefits of participation, social benefits of participation, a relationship with nature, the benefit to the environment of participation, risks associated with participation, and training received as part of activity completion

Notes		
Risk of bias		
Bias	**Authors' judgement**	**Support for judgement**
Random sequence generation (selection bias)	Unclear risk	Not applicable - qualitative study
Allocation concealment (selection bias)	Unclear risk	Not applicable - qualitative study
Blinding of participants and personnel (performance bias) All outcomes	Unclear risk	Not applicable - qualitative study
Blinding of outcome assessment (detection bias) All outcomes	Unclear risk	Not applicable - qualitative study
Incomplete outcome data (attrition bias) All outcomes	Unclear risk	Not applicable - qualitative study
Selective reporting (reporting bias)	Unclear risk	Not applicable - qualitative study
Other bias	Unclear risk	Not applicable - qualitative study
Wallce Criteria for appraising qualitative evidence	High risk	Is the research question clear? *No, not explicitly stated* Perspective of author clear? *Yes* Perspective influenced the study design? *Yes* Is study design appropriate? *Yes* Is the context adequately described? *Yes* Sample adequate to explore range of subjects/settings? *Can't tell, lack of discussion about population and sample* Sample drawn from appropriate population? *Can't tell* Data collection adequately described? *No, not enough detail* Data collection rigorously conducted? *Can't tell* Data analysis rigorously conducted? *Can't tell* Findings substantiated/limitations considered? *Yes* Claims to generalizability follow from data? *Yes* Ethical issues addressed? *Can't tell, not discussed*

EPHPP Criteria	Unclear risk	Not applicable - qualitative study

Caissie 2003

Methods	**Study design** Qualitative. A pilot focus group and interview and then semi-structured interviews **Study period** No information was given relating to the study period **Timing of intervention** The intervention was delivered over three-day to 17-day periods, no information was given relating to the timing of these periods **Sampling** A sampling frame was derived from randomly selected records (n = 20) of a volunteer organisation in southern Ontario (The Nature Conservancy) and were telephoned and asked to participate. Overall, half of those contacted agreed to be included in the study **Data collection** The pilot was one focus group and one interview with a test schedule. Semi-structured interviews were then undertaken, each lasting between 20 and 50 minutes in length **Analysis process** Thematic analysis, data were transcribed verbatim and then organised using NVivo. Data were coded into major patterns and themes, which were justified using the centrality of theme rather than frequency of comment. Constant comparison of coded theme and the literature with the data resulted in the final themes
Participants	**Sample size** n = 10 **Country, area** Canada, Southern Ontario, rural locations **Sample characteristics** Individuals aged between 17-63 years were included and no further age breakdown was given. Half the participants were women
Interventions	**Intervention description** The study examined volunteer tourists (those travelling more than 80 km) who were Ontario residents undertaking three- to 17-day working vacations. The intervention was provided by Trust for Nature and consisted of creating and restoring habitat, constructing nature trails and conducting ecological surveys. Whilst ecological surveys are not an includable activity these represented only a third of the activity and so the study was considered includable **Time frame and frequency** Individuals completed three- to 17-day working vacations, no further information was provided **Location in nature** No information was provided relating to the location in the natural environment
Outcomes	**Themes identified** Three main themes emerged from the authors' analysis: perceptions of nature/environment/conservation, the volunteering context, and altruism and legacy

Notes		
Risk of bias		
Bias	**Authors' judgement**	**Support for judgement**
Random sequence generation (selection bias)	Unclear risk	Not applicable - qualitative study
Allocation concealment (selection bias)	Unclear risk	Not applicable - qualitative study
Blinding of participants and personnel (performance bias) All outcomes	Unclear risk	Not applicable - qualitative study
Blinding of outcome assessment (detection bias) All outcomes	Unclear risk	Not applicable - qualitative study
Incomplete outcome data (attrition bias) All outcomes	Unclear risk	Not applicable - qualitative study
Selective reporting (reporting bias)	Unclear risk	Not applicable - qualitative study
Other bias	Unclear risk	Not applicable - qualitative study
Wallce Criteria for appraising qualitative evidence	Low risk	Is the research question clear? *Yes* Perspective of author clear? *Yes* Perspective influenced the study design? *Yes* Is study design appropriate? *Yes* Is the context adequately described? *Yes* Sample adequate to explore range of subjects/settings? *Yes* Sample drawn from appropriate population? *Yes* Data collection adequately described? *Yes* Data collection rigorously conducted? *Yes* Data analysis rigorously conducted? *Yes* Findings substantiated/limitations considered? *Yes* Claims to generalizability follow from data? *Yes* Ethical issues addressed? *Yes*
EPHPP Criteria	Unclear risk	Not applicable - qualitative study

Carter 2008

Methods	**Study design** Qualitative, evaluation of a pilot study **Study period** The evaluation took place parallel to the intervention, in 2008 **Timing of intervention** The intervention was delivered over a six-month period for both community sentence and custodial participants **Sampling** No information is given on the sampling methods used to select participants **Data collection** Lack of detail, stating 'first-hand accounts' as data collection method **Analysis process** No information is given about the analysis procedure, though themes are described in the report and so thematic analysis is presumed
Participants	**Sample size** No information is given about the sample size **Country, area** UK, area not specified **Sample characteristics** 'Offenders and Nature' scheme participants were included in the study. These were individuals enrolled during community sentences. No other information was given relating to the sample
Interventions	**Intervention description** Reparative work with distinct and visible benefits for the public. Included: pathway creation, restoring habitat, and invasive species removal **Time frame and frequency** Activities were undertaken over a period of six months. Participants serving community sentence undertook activities one to two days per week, and custodial participants undertook activities full-time **Location in nature** Activities took place in woodland, and were managed by the Forestry Commission
Outcomes	**Themes identified** Health and well-being and rebuilding a sense of self-worth/identity emerged as key themes in the authors' discussion
Notes	Little information is provided as to the sample or analysis undertaken in this study. The authors were contacted for more information but the broader report from which this paper is drawn was not available

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Unclear risk	Not applicable - qualitative study

Allocation concealment (selection bias)	Unclear risk	Not applicable - qualitative study
Blinding of participants and personnel (performance bias) All outcomes	Unclear risk	Not applicable - qualitative study
Blinding of outcome assessment (detection bias) All outcomes	Unclear risk	Not applicable - qualitative study
Incomplete outcome data (attrition bias) All outcomes	Unclear risk	Not applicable - qualitative study
Selective reporting (reporting bias)	Unclear risk	Not applicable - qualitative study
Other bias	Unclear risk	Not applicable - qualitative study
Wallce Criteria for appraising qualitative evidence	High risk	Is the research question clear? *No, not indicated* Perspective of author clear? *Yes* Perspective influenced the study design? *Can't tell* Is study design appropriate? *Can't tell* Is the context adequately described? *Yes* Sample adequate to explore range of subjects/settings? *Can't tell, not described* Sample drawn from appropriate population? *Can't tell* Data collection adequately described? *No, not described* Data collection rigorously conducted? *Can't tell* Data analysis rigorously conducted? *Can't tell* Findings substantiated/limitations considered? *No* Claims to generalizability follow from data? *Yes* Ethical issues addressed? *No*
EPHPP Criteria	Unclear risk	Not applicable - qualitative study

Christie 2004

Methods	**Study design** Qualitative. Semi-structured interviews **Study period** The research for this study was conducted throughout 2002 **Timing of intervention** No information was given relating to the timing of the intervention period **Sampling** No information was given relating to the selection of participants for this study **Data collection** Semi-structured interviews were conducted with volunteers to a 'Greening Western Sydney' project. Interviews were also conducted with paid staff on the project however these were reported separately and so the study met our inclusion criteria for this review. The interviews lasted between 20 - 30 minutes and were based around four open-ended questions **Analysis process** No information was given relating to the analysis procedure, however the discussion and results sections seem to be based around the question format and so framework analysis was presumed
Participants	**Sample size** n = 12 **Country, area** Australia, Sydney, peri-urban Sydney areas **Sample characteristics** Participants were regular, active volunteers in the Greening Western Sydney Programme. No information was given relating to the participants' age, except that 50% were retired and 50% were employed. Two of those who were in employment were Technical and Further Education (TAFE) teachers who regularly brought adult migrant English language students for one-off volunteering experiences. The only other information relating to the sample was that none lived in the local area
Interventions	**Intervention description** Peri-urban rehabilitation of belt-land around western Sydney: bush regeneration, seed collection, tree planting, nursery work **Time frame and frequency** The time frame of the intervention was not described, participants engaged in activities weekly **Location in nature** Activities took place in peri-urban bushland
Outcomes	**Themes identified** Four major themes were described in the results: environmental attitudes and reasons for involvement, satisfaction with effectiveness of work undertaken, vision for the environmental future of western Sydney, and the effects of involvement
Notes	This research was funded by Greening Australia and the New South Wales Department of Infrastructure
Risk of bias	

Christie 2004 (*Continued*)

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Unclear risk	Not applicable - qualitative study
Allocation concealment (selection bias)	Unclear risk	Not applicable - qualitative study
Blinding of participants and personnel (performance bias) All outcomes	Unclear risk	Not applicable - qualitative study
Blinding of outcome assessment (detection bias) All outcomes	Unclear risk	Not applicable - qualitative study
Incomplete outcome data (attrition bias) All outcomes	Unclear risk	Not applicable - qualitative study
Selective reporting (reporting bias)	Unclear risk	Not applicable - qualitative study
Other bias	Unclear risk	Not applicable - qualitative study
Wallce Criteria for appraising qualitative evidence	High risk	Is the research question clear? *Yes* Perspective of author clear? *Yes* Perspective influenced the study design? *Yes* Is study design appropriate? *Yes* Is the context adequately described? *Yes* Sample adequate to explore range of subjects/settings? *Yes* Sample drawn from appropriate population? *Yes* Data collection adequately described? *Yes* Data collection rigorously conducted? *Can't tell, not described* Data analysis rigorously conducted? *Can't tell, not enough detail* Findings substantiated/limitations considered? *No, not linked to literature* Claims to generalizability follow from data? *Yes* Ethical issues addressed? *No*
EPHPP Criteria	Unclear risk	Not applicable - qualitative study

Eastaugh 2010

Methods	**Study design** Quantitative. uBA **Study period** The study ran parallel to the intervention **Timing of intervention** The intervention periods included in the study ran from April 2007 to March 2008, then also from April 2008 to March 2009 **Sampling** No information was given relating to the selection of participants for the study **Data collection** The authors provide little information except to state the base line assessment on joining the project followed by an assessment at three and six months using SF-36, which assesses a participant's mental, social and physical health. SF36 gives each participant a score out of 100, which is then used to assess how far the individual has travelled towards improved health since joining the project **Analysis process** No formal analysis was undertaken. Results from subsequent SF-36 surveys were compared with figures from baseline
Participants	**Sample size** n = 8 **Country, area** UK, Herefordshire, rural **Sample characteristics** The eight participants were drawn from the two populations undertaking the activities at the two time points (31 and 51 respectively), little information is provided except that all were unemployed and at-risk youths with some mental ill health
Interventions	**Intervention description** Wye Wood offers a range of woodland-based activities at different levels designed to improve an individual's health at a rate compatible with that individual's needs. Walking and coppicing are the two principal activities offered, with opportunities for training resulting in qualifications and volunteering offered where appropriate. The recent development of a small-scale Social Enterprise gives participants a progression route towards further volunteering or employment. Coppicing was the main activity undertaken in this study **Time frame and frequency** Participants undertook activities over two lots of three-month periods, and took part in two woodland management days per week **Location in nature** Woodland activities were provided by the Wye Woods social enterprise
Outcomes	**Quality of life measures** SF-36
Notes	
Risk of bias	

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Unclear risk	See EPHPP assessment below
Allocation concealment (selection bias)	Unclear risk	See EPHPP assessment below
Blinding of participants and personnel (performance bias) All outcomes	Unclear risk	See EPHPP assessment below
Blinding of outcome assessment (detection bias) All outcomes	Unclear risk	See EPHPP assessment below
Incomplete outcome data (attrition bias) All outcomes	Unclear risk	See EPHPP assessment below
Selective reporting (reporting bias)	Unclear risk	See EPHPP assessment below
Other bias	Unclear risk	See EPHPP assessment below
Wallce Criteria for appraising qualitative evidence	Unclear risk	Not applicable - quantitative study
EPHPP Criteria	High risk	**Component Ratings** ***A) Selection bias*** Q1) Are the individuals selected to participate in the study likely to be representative of the target population? *Not likely* Q2) What percentage of selected individuals agreed to participate? *Can't tell* **Rating (Section A): Weak** ***B) Study design*** Indicate the study design: *Before and after* Was the study described as randomised? If NO, go to component C. *No* If YES, was the method of randomisation described? If YES, was the method appropriate? **Rating (Section B): Weak** **C) Confounders** Q1) Were there important differences between groups prior to the intervention? *Can't tell* Q2) If YES, indicate the percentage of relevant confounders that were controlled (either in design (e.g. stratification, matching)

		or analysis)? *Can't tell* **Rating (Section C): Weak** ***D) Blinding*** Q1) Was (were) the outcome assessor(s) aware of the intervention or exposure status of participants? *Yes* Q2) Were the study participants aware of the research question? *Yes* **Rating (Section D): Weak** ***E) Data collection methods*** Q1) Were data collection tools shown to be valid? *Yes* Q2) Were data collection tools shown to be reliable? *Yes* **Rating (Section E): Moderate** ***F) Withdrawals and drop-outs*** Q1) Were withdrawals and drop-outs reported in terms of numbers and/or reasons per group? *No* Q2) Indicate the percentage of participants completing the study. (If the percentage differs by groups, record the lowest). *Can't tell* **Rating (Section F): Weak** ***G) Intervention integrity*** Q1) What percentage of participants received the allocated intervention or exposure of interest? *Can't tell* Q2) Was the consistency of the intervention measured? *No* Q3) Is it likely that subjects received an unintended intervention (contamination or co-intervention) that may influence the results? *Yes* ***H) Analyses*** Q1) Indicate the unit of allocation. *Individual* Q2) Indicate the unit of analysis. *Individual* Q3) Are the statistical methods appropriate for the study design? *Yes* Q4) Is the analysis performed by intervention allocation status (i.e. intention to treat) rather than the actual intervention received? *Yes* **Global rating for this paper: Weak** Discrepancy between reviewers? *No* Final decision of both reviewers: Weak

Gooch 2005

Methods	**Study design** Qualitative. Semi-structured interviews with both individuals and groups. The author stated that she took a phenomenological approach **Study period** No information was given relating to the timing of the study **Timing of intervention** No information was given relating to the intervention period of the study **Sampling** Catchment volunteers were approached from stewardship groups and programmes including Landcare, Coastcare, Bushcare, Greening Australia, Waterwatch, and Integrated Catchment Management **Data collection** Twenty-six semi-structured interviews were conducted with catchment volunteers, 13 were personal interviews and the rest comprised groups of two to 10 participants; 85 people took part in the study **Analysis process** The authors stated that phenomenologic (thematic) analysis was used Variations in experiences were teased out from individual conversations, then similar ideas gathered together. These were sorted into conceptual categories of description. Categories were generated purely as a result of the transcripts of the interviewees' discourses - no prior categorisation took place. Collectively, the categories of description were expressed as 'conceptions' which depict the internal relations between the individuals and the phenomena, in this case 'catchment volunteering'. An 'outcome space', an illustrative model of the conceptions and the relationship between them, was developed as part of the analysis
Participants	**Sample size** n = 85 **Country, area** Australia, the region is not clear but the analysis procedure states that interviews were conducted along the east coast of Queensland, from Brisbane to Mossman **Sample characteristics** No information on sample characteristics, beyond activity engagement, was given
Interventions	**Intervention description** The authors only give a background to the movement as a whole, with no specific intervention description. The Landcare movement is a general land ethic among individuals concerned with land degradation. The movement includes a variety of stewardship groups such as Community Landcare, Rivercare, Bushcare and Waterwatch. Such groups are often organised on a local scale, using catchments as natural boundaries **Time frame and frequency** No information was given relating to the time frame or frequency of participation in the intervention **Location in nature** Activities were undertaken in a variety of settings, the authors state Community Landcare, Rivercare, Bushcare and Waterwatch
Outcomes	**Themes identified** Six conceptions were described by the analysis of the interview data, each represents a way that participants experienced catchment volunteering (CV): CV as seeking and

	maintaining balance, CV as developing and maintaining and identity, CV as learning and networking, CV as empowering, CV as sustainable	
Notes		

Risk of bias

Bias	**Authors' judgement**	**Support for judgement**
Random sequence generation (selection bias)	Unclear risk	Not applicable - qualitative study
Allocation concealment (selection bias)	Unclear risk	Not applicable - qualitative study
Blinding of participants and personnel (performance bias) All outcomes	Unclear risk	Not applicable - qualitative study
Blinding of outcome assessment (detection bias) All outcomes	Unclear risk	Not applicable - qualitative study
Incomplete outcome data (attrition bias) All outcomes	Unclear risk	Not applicable - qualitative study
Selective reporting (reporting bias)	Unclear risk	Not applicable - qualitative study
Other bias	Unclear risk	Not applicable - qualitative study
Wallce Criteria for appraising qualitative evidence	High risk	Is the research question clear? *Yes* Perspective of author clear? *No* Perspective influenced the study design? *Can't tell* Is study design appropriate? *Yes* Is the context adequately described? *No, very little description of activities* Sample adequate to explore range of subjects/settings? *Can't tell, lack of detail regarding sample makes it difficult to estimate* Sample drawn from appropriate population? *Can't tell* Data collection adequately described? *Yes* Data collection rigorously conducted? *Can't tell, not described* Data analysis rigorously conducted? *Yes* Findings substantiated/limitations considered? *Yes* Claims to generalizability follow from data? *None made*

		Ethical issues addressed? *No*
EPHPP Criteria	Unclear risk	Not applicable - qualitative study

O'Brien 2008a

Methods	**Study design** Mixed methods, uBA and interviews with participants **Study period** The research was conducted parallel with the intervention in 2007 **Timing of intervention** The intervention lasted three weeks, and given information relating to the study design it is fair to assume it was also during 2007 **Sampling** Both the quantitative and qualitative elements used the same participants, who were purposively sampled from a population drawn from 10 environmental volunteering groups. By 'purposeful' the authors state that organisations were selected to be involved in the research in order to cover a range of groups in both size and scope, to include urban and rural volunteering and to cover volunteers from a range of ages and different socio-economic backgrounds as well as a range of activities. The groups (except The Wildlife Trusts) were located in northern England and southern Scotland. Twelve organisations were involved in the research (see interventions). Respondents completed consent forms prior to participation **Data collection** The quantitative element of the study comprised the administration of questionnaires, by the researchers, to participants at selected groups before and after the activity was undertaken. The qualitative element consisted of interviews conducted at convenient moments with the researcher. Interviews were audio recorded. Whilst not interviewing, the researcher completed activities with the participants. None of the interviewees reported feeling pressured to complete the study **Analysis process** Quantitative data were analysed using SPSS, where correlations were explored. Qualitative data were transcribed verbatim, imported into NVivo and then coded. Emergent themes were identified which then formed the basis of the conceptual framework explaining motivations and benefits
Participants	**Sample size** n = 88 **Country, area** UK, northern England/southern Scotland **Sample characteristics** Participants' mean age was 43 years, with 24% of the sample being between 18 - 24 years old; 28% were female, 91% were White; 32% of participants were employed full time, 26% retired and 19.5% were unemployed. A range of disabilities was reported, from mental ill health to general health difficulties and learning difficulties. The authors state that a range of socio-economic groups were included. The volunteers had a range of experience, 17% were in their first month, 25% were between one to five years of engagement and 12% had more than five years. 35% reported more than five days a week of over 30 minutes of activity

Interventions	**Intervention description** Ten groups were included in the sampling process and consisted of a range of environmental volunteering outdoors: vegetation clearance, creating fences, tree planting, removal of invasive species, tree thinning and sapling removal. More broadly the groups were involved in the restoration of degraded habitats, clearance operations of rubbish or invasive species, conservation of existing habitats, maintenance of amenities such as footpaths and trails and the creation of new habitats and habitat networks **Time frame and frequency** Activity duration ranged from 0 - 8 hours (25%) to 33+ hours, and were undertaken either weekly or bi-weekly for three weeks **Location in nature** Activities were conducted in a range of settings - lakes, nature reserves, woodland and grassland being the most common. Activities were provided by The Wildlife Trusts, RSPB, BTCV, Forestry Commision Scotland, National Trust, Forestry Commission England, National trust for Scotland, Borders Forest Trust, Scottish National Heritage, Natural England, Durham Bird Club, Friends of the Lake District and Gateshead Council
Outcomes	**Mental** Emotional State Scale (ESS), adapted from the Osgood Semantic Differential Scale **Quality of life measures** Personal well-being index (PWI). **Themes identified** The authors identified eight main themes in their data during the qualitative element of the study: interest generated through an appreciation of being outdoors and environmental awareness, training and skills, need for activity (including after retirement or when unable to work), personal contact and encouragement, organisations motivating and rewarding volunteers, being outdoors, general well-being or holistic well-being, meaning and satisfaction
Notes	This research was funded by the Scottish Forestry Trust and the Forestry Commission

Risk of bias

Bias	**Authors' judgement**	**Support for judgement**
Random sequence generation (selection bias)	Unclear risk	See EPHPP assessment below
Allocation concealment (selection bias)	Unclear risk	See EPHPP assessment below
Blinding of participants and personnel (performance bias) All outcomes	Unclear risk	See EPHPP assessment below
Blinding of outcome assessment (detection bias) All outcomes	Unclear risk	See EPHPP assessment below

Incomplete outcome data (attrition bias) All outcomes	Unclear risk	See EPHPP assessment below
Selective reporting (reporting bias)	Unclear risk	See EPHPP assessment below
Other bias	Unclear risk	See EPHPP assessment below
Wallce Criteria for appraising qualitative evidence	Low risk	Is the research question clear? *Yes* Perspective of author clear? *Yes* Perspective influenced the study design? *Can't tell, limited information* Is study design appropriate? *Yes* Is the context adequately described? *Yes* Sample adequate to explore range of subjects/settings? *Yes* Sample drawn from appropriate population? *Can't tell, little information* Data collection adequately described? *Yes* Data collection rigorously conducted? *Yes* Data analysis rigorously conducted? *Yes* Findings substantiated/limitations considered? *Yes* Claims to generalizability follow from data? *Can't tell, none made* Ethical issues addressed? *No*
EPHPP Criteria	High risk	**Component Ratings** ***A) Selection bias*** Q1) Are the individuals selected to participate in the study likely to be representative of the target population? *Not likely* Q2) What percentage of selected individuals agreed to participate? *80% - 100%* **Rating (Section A): weak** ***B) Study design*** Indicate the study design: *Before and after* Was the study described as randomised? If NO, go to component C. *No* If YES, was the method of randomisation described? If YES, was the method appropriate? **Rating (Section B): Weak** ***C) Confounders*** Q1) Were there important differences between groups prior to the intervention? *Yes* Q2) If YES, indicate the percentage of relevant confounders that were controlled (either in design (e.g. stratification, matching)

		or analysis)? *60% - 79%* **Rating (Section C): Moderate** ***D) Blinding*** Q1) Was (were) the outcome assessor(s) aware of the intervention or exposure status of participants? *Yes* Q2) Were the study participants aware of the research question? *Yes* **Rating (Section D): Weak** ***E) Data collection methods*** Q1) Were data collection tools shown to be valid? *No* Q2) Were data collection tools shown to be reliable? *No* **Rating (Section E): Weak** ***F) Withdrawals and drop-outs*** Q1) Were withdrawals and drop-outs reported in terms of numbers and/or reasons per group? *No* Q2) Indicate the percentage of participants completing the study. (If the percentage differs by groups, record the lowest). *80% - 100%* **Rating (Section F): Strong** ***G) Intervention integrity*** Q1) What percentage of participants received the allocated intervention or exposure of interest? *80% - 100%* Q2) Was the consistency of the intervention measured? *No* Q3) Is it likely that subjects received an unintended intervention (contamination or co-intervention) that may influence the results? *Yes* ***H) Analyses*** Q1) Indicate the unit of allocation. *Organisation* Q2) Indicate the unit of analysis. *Individual* Q3) Are the statistical methods appropriate for the study design? *Yes* Q4) Is the analysis performed by intervention allocation status (i.e. intention to treat) rather than the actual intervention received? *No* **Global rating for this paper: Weak** Discrepancy between reviewers? *No* Final decision of both reviewers: Weak

O'Brien 2010a

Methods	**Study design** Qualitiative. Ethnographic case study and interviews. The ethnography element is under-reported, however may have influenced later stages of data collection and analysis **Study period** The authors state that data were collected between 2003 and 2007 **Timing of intervention** No information is provided relating to the timing of the intervention **Sampling** Very little information is given relating to the sampling strategy adopted in the study, the authors state that participants were recruited from environmental volunteering programmes across the UK and that they represented a variety of disabilities and social disadvantage **Data collection** Little information is provided relating to the data collection procedure. Ten interviews were conducted with participants alongside an ethnographic case study undertaken by one author. This case study provided an inside view of the strands of activities performed by participants and practitioners and their outcomes in observed physical, psychological, social and ecological terms **Analysis process** The authors state that thematic analysis was used to inductively identify patterns in the data. Interviews were transcribed and read along with notes from field notes. These were coded and then re-coded. Codes were used in the development of key themes and quotes used to identify and illustrate key themes
Participants	**Sample size** n = 10 **Country, area** England, London, urban **Sample characteristics** The 10 participants were aged between 22-60 years and four were female. 45% were white British, 20 Black or black British African, 15% Asian or Asian British, 10% White European, 10% Black or Black British Caribbean. All the participants were unemployed and all were either volunteers or referred by a GP. All were on incapacity benefits. Approximately six participants were on site each day, with around 30 - 35 individuals with mental ill health on the books at one time
Interventions	**Intervention description** A targeted therapeutic intervention which involved environmental volunteering. A contemporary eco-therapeutic model focusing on the healing of the environment through conservation, and of the self through physical and mental health improvements **Time frame and frequency** The participants engaged with activities for a number of months, depending on the individual. Activities were undertaken for two to three days per week for a full day **Location in nature** Urban wildlife garden (not a formal garden space), managed by the charitable organisation Kensington and Chelsea Mind
Outcomes	**Themes identified** Three themes were identified by the authors as emerging from the data: improving relations with others and nature, working alongside others, and developing social and

	employability skills	
Notes	This research was funded by the Scottish Forestry trust and the Forestry Commisison	
Risk of bias		
Bias	**Authors' judgement**	**Support for judgement**
Random sequence generation (selection bias)	Unclear risk	Not applicable - qualitative study
Allocation concealment (selection bias)	Unclear risk	Not applicable - qualitative study
Blinding of participants and personnel (performance bias) All outcomes	Unclear risk	Not applicable - qualitative study
Blinding of outcome assessment (detection bias) All outcomes	Unclear risk	Not applicable - qualitative study
Incomplete outcome data (attrition bias) All outcomes	Unclear risk	Not applicable - qualitative study
Selective reporting (reporting bias)	Unclear risk	Not applicable - qualitative study
Other bias	Unclear risk	Not applicable - qualitative study
Wallce Criteria for appraising qualitative evidence	Low risk	Is the research question clear? *Yes* Perspective of author clear? *Yes* Perspective influenced the study design? *Can't tell, limited information* Is study design appropriate? *Yes* Is the context adequately described? *Yes* Sample adequate to explore range of subjects/settings? *Yes* Sample drawn from appropriate population? *Can't tell, little information* Data collection adequately described? *Yes* Data collection rigorously conducted? *Yes* Data analysis rigorously conducted? *Yes* Findings substantiated/limitations considered? *Yes* Claims to generalizability follow from data? *Can't tell, none made* Ethical issues addressed? *Yes*
EPHPP Criteria	Unclear risk	Not applicable - qualitative study

Pillemer 2010

Methods	**Study design** Quantitative. retrospective cohort study **Study period** The period of the research was not specified **Timing of intervention** The analysis included data from waves of a longitudinal study administered in 1974 and 1994 **Sampling** Randomly sampled to represent the Alameda, California population for the longitudinal study and then recruited to this study from the 1974 and 1994 waves. The experimental group was those self-selecting participation in environmental volunteering and the control was those selecting other forms of volunteering **Data collection** The data set used in this study was collected from the non-institutionalised adult population of Alameda County, California. This 'Alameda County Study' collected survey responses from 6928 individuals in 1965 and then there were follow up surveys in 1974, 1983, and 1994 with response rates of 85%, 87%, and 93% respectively. This study employs the 1974 and 1994 data because questions relating to the environment were first asked in 1974. A non-intervention study, this retrospective cohort analysis used the dependent variable as a proxy for an intervention **Analysis process** Logistic and multiple regression analyses were employed. Models were adjusted for levels of physical activity, age, gender, education, martial status, social isolation, chronic conditions and functional impairment. Logistic regression estimated the effects of volunteering on subsequent perceived health
Participants	**Sample size** n = 2630 (6928 overall, 4864 in 1974 wave, declining to 2730 (attrition rate of 44%)). Environmental volunteers, n = 155, other volunteers, n = 1186 **Country, area** USA, Alameda County, California, rural and urban **Sample characteristics** Of the sample included in the study, the mean age was 44.7 years and 57% were female; 81.5% had a high school education or higher; 22% suffered from a single chronic condition; 5.1% suffered from two or more chronic conditions; 1.3% were functionally impaired; 11.9% of the sample were considered socially isolated; 83.1% were married The control group consisted of alternative volunteering as distinct from environmental volunteering which included child groups (scouts etc.), community groups, charity, services, church groups, civil liberty groups, and self-improvement groups Of those who were no longer in the sample between the two waves, 1878 were known to have died. The final sample was compared to those with 1974 data but no 1994 data, and the sample was younger and in better health
Interventions	**Intervention description** The 1974 wave included variables related to volunteering for the first time. Participants were asked to record their involvement with a range of groups: from those with children, community groups etc., to those also engaged with environmental groups. Engagement was considered to be voluntary **Time frame and frequency** No time frame information was given relating to the intervention, however participants

	were asked to rate their activities on a three-point scale: 'very active', 'somewhat active' and 'inactive'. Variables were created for those who were somewhat or very active in environmental volunteering. The same was done for other volunteering **Location in nature** The location in nature was not specified for each participant and so was mixed. No provider information was given
Outcomes	**Physical** A four-point scale which asked individuals to report the frequency of active sports, swimming or long walks, walking in the garden, doing physical exercises. Responses were on a three-point scale: 'often', 'sometimes' or 'never'. Responses to these variables were summed to create a physical activity scale ranging from 0 - 14 at both time points Functional impairment was also reported **Mental** Depression was measured using an 18-item scale including mood disturbance, loss of energy, problems eating and sleeping and agitation. Items were summed so that there was a depression score out of 18, those with a score of 5 or above were coded as depressed **Quality of life measures** Perceived health in 1974 and 1994 was measured by participants' response to: 'All in all, would you say your health is excellent, good, fair or poor?'. The four options were collapsed into two categories: fair/poor and good/excellent **Social** Social isolation: individuals reported the number of close friends or relatives they saw at least once a month (0 - 12+)
Notes	This research was funded through an Edward R. Roybal Centre grant from the National Institute on Ageing (1P30AG022845)

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Unclear risk	See EPHPP assessment below
Allocation concealment (selection bias)	Unclear risk	See EPHPP assessment below
Blinding of participants and personnel (performance bias) All outcomes	Unclear risk	See EPHPP assessment below
Blinding of outcome assessment (detection bias) All outcomes	Unclear risk	See EPHPP assessment below
Incomplete outcome data (attrition bias) All outcomes	Unclear risk	See EPHPP assessment below
Selective reporting (reporting bias)	Unclear risk	See EPHPP assessment below

Other bias	Unclear risk	See EPHPP assessment below
Wallce Criteria for appraising qualitative evidence	Unclear risk	Not applicable - quantitative study
EPHPP Criteria	High risk	**Component Ratings** ***A) Selection bias*** Q1) Are the individuals selected to participate in the study likely to be representative of the target population? *Can't tell* Q2) What percentage of selected individuals agreed to participate? *80% - 100%* **Rating (Section A): Weak** ***B) Study design*** Indicate the study design: retrospective cohort Was the study described as randomised? If NO, go to component C. *No* If YES, was the method of randomisation described? If YES, was the method appropriate? **Rating (Section B): Weak** ***C) Confounders*** Q1) Were there important differences between groups prior to the intervention? *Yes* Q2) If YES, indicate the percentage of relevant confounders that were controlled (either in design (e.g. stratification, matching) or analysis)? *80% - 100%* **Rating (Section C): Strong** ***D) Blinding*** Q1) Was (were) the outcome assessor(s) aware of the intervention or exposure status of participants? *Yes* Q2) Were the study participants aware of the research question? *No* **Rating (Section D): Moderate** ***E) Data collection methods*** Q1) Were data collection tools shown to be valid? Can't tell Q2) Were data collection tools shown to be reliable? Can't tell **Rating (Section E): Weak** F***) Withdrawals and drop-outs*** Q1) Were withdrawals and drop-outs reported in terms of numbers and/or reasons per group? *Yes* Q2) Indicate the percentage of participants

		completing the study. (If the percentage differs by groups, record the lowest). *Less than 60%* **Rating (Section F): Weak** ***G) Intervention integrity*** Q1) What percentage of participants received the allocated intervention or exposure of interest? *Less than 60%* Q2) Was the consistency of the intervention measured? *No* Q3) Is it likely that subjects received an unintended intervention (contamination or co-intervention) that may influence the results? *Yes* ***H) Analyses*** Q1) Indicate the unit of allocation. *Individual* Q2) Indicate the unit of analysis.*Individual* Q3) Are the statistical methods appropriate for the study design? *Yes* Q4) Is the analysis performed by intervention allocation status (i.e. intention to treat) rather than the actual intervention received? *Can't tell* **Global rating for this paper: Weak** Discrepancy between reviewers? *No* Final decision of both reviewers: Weak

Reynolds 1999a

Methods	**Study design** Quantitative. uBA **Study period** The study ran parallel to the intervention **Timing of intervention** The intervention ran from March 1998 to May 1999 **Sampling** No information was given relating to the selection of participants for this study **Data collection** Measured Green Gym participants' fitness levels and perceived health status at the start and completion of a six-month period of conservation work. A survey was distributed to participants before and after activity (six-month period), no further information is given **Analysis process** Fitness was assessed using AIStats (paired t-tests on SF-36: scaled variables). Matched paired tests were carried out

Reynolds 1999a (*Continued*)

Participants	**Sample size** n = 16 (23 initially agreed to be included in the study, an adherence rate of 72%) **Country, area** England, Oxfordshire **Sample characteristics** Green Gym volunteers. The age range of the sample was 40 - 73 years (mean 59.6 years) . Seven of the participants were female, no other information was given relating to the sample in the study. Some participants were referred to the scheme
Interventions	**Intervention description** Green Gym activities, in this case clearing overgrown vegetation to make room for rare species of flora or fauna, building stiles, erecting fences, coppicing, planting trees and wildflowers, hedge laying and building dry stone walls. The majority of engagement was through self-referral, though there were some participants who were referred by a health professional. Some warm-up activities were undertaken before the main sessions **Time frame and frequency** The participants undertook activities for three hours twice weekly over a six-month period **Location in nature** The activities took place in a variety of environments, and were provided by BTCV
Outcomes	**Physiological** Aerobic capacity, the Rockport one mile walking test BMI Flexibility (sit and reach method) Balance (stork stand method) Grip strength (kg) Blood pressure Height Weight Waist and hip ratio **Quality of life measures** SF-36
Notes	

Risk of bias

Bias	**Authors' judgement**	**Support for judgement**
Random sequence generation (selection bias)	Unclear risk	See EPHPP assessment below
Allocation concealment (selection bias)	Unclear risk	See EPHPP assessment below
Blinding of participants and personnel (performance bias) All outcomes	Unclear risk	See EPHPP assessment below

Blinding of outcome assessment (detection bias) All outcomes	Unclear risk	See EPHPP assessment below
Incomplete outcome data (attrition bias) All outcomes	Unclear risk	See EPHPP assessment below
Selective reporting (reporting bias)	Unclear risk	See EPHPP assessment below
Other bias	Unclear risk	See EPHPP assessment below
Wallce Criteria for appraising qualitative evidence	Unclear risk	Not applicable - quantitative study
EPHPP Criteria	High risk	**Component Ratings** ***A) Selection bias*** Q1) Are the individuals selected to participate in the study likely to be representative of the target population? *Not likely* Q2) What percentage of selected individuals agreed to participate? *Can't tell* **Rating (Section A): Weak** ***B) Study design*** Indicate the study design: *Before and after* Was the study described as randomised? If NO, go to component C. *No* If YES, was the method of randomisation described? If YES, was the method appropriate? **Rating (Section B): Weak** ***C) Confounders*** Q1) Were there important differences between groups prior to the intervention? *Can't tell* Q2) If YES, indicate the percentage of relevant confounders that were controlled (either in design (e.g. stratification, matching) or analysis)? **Rating (Section C): Weak** ***D) Blinding*** Q1) Was (were) the outcome assessor(s) aware of the intervention or exposure status of participants? *Yes* Q2) Were the study participants aware of the research question? *Can't tell* **Rating (Section D): Weak** ***E) Data collection methods*** Q1) Were data collection tools shown to be

		valid? *Yes* Q2) Were data collection tools shown to be reliable? *Yes* **Rating (Section E): Strong** ***F) Withdrawals and drop-outs*** Q1) Were withdrawals and drop-outs reported in terms of numbers and/or reasons per group? *No* Q2) Indicate the percentage of participants completing the study. (If the percentage differs by groups, record the lowest). *60% - 79%* **Rating (Section F): Weak** ***G) Intervention integrity*** Q1) What percentage of participants received the allocated intervention or exposure of interest? *80% - 100%* Q2) Was the consistency of the intervention measured? *No* Q3) Is it likely that subjects received an unintended intervention (contamination or co-intervention) that may influence the results? *Yes* ***H) Analyses*** Q1) Indicate the unit of allocation. *Individual* Q2) Indicate the unit of analysis. *Individual* Q3) Are the statistical methods appropriate for the study design? *Yes* Q4) Is the analysis performed by intervention allocation status (i.e. intention to treat) rather than the actual intervention received? *Can't tell* **Global rating for this paper: Weak** Discrepancy between reviewers? *No* Final decision of both reviewers: Weak

Small Woods 2011a

Methods	**Study design** Quantitative. uBA **Study period** The study ran parallel to the intervention **Timing of intervention** The intervention ran for a 12-week period, no other information is provided **Sampling** No information was given relating to the recruitment of participants to the study **Data collection** Project teams in the two collection sites (Hereford and Tick Wood) carried out repeated SF-36 assessments with the participants. Respondents filled in tick boxes for each of the 36 questions which make up the metric **Analysis process** The information is then analysed by inputting the answers into an Excel programme, which calculates a personal score for the individuals, with 100 being the top score
Participants	**Sample size** There were two projects included in this study: 1. Hereford, n = 3 2. Tick Wood, n = 4 **Country, area** England, Hereford and Telford **Sample characteristics** The participants included were female offenders, or those at risk of offending. Referral to the projects was through Probation Trusts and similar related agencies. No further information was given relating to the sample characteristics
Interventions	**Intervention description** 'Amazon Woman' was a 12-week structured learning programme which demonstrated the opportunities for women offenders within the occupationally segregated Forestry sector. The women received expert tuition and support to gain skills in woodland management and greenwood crafts **Time frame and frequency** Activities were undertaken for two days per week for a total of 12 weeks **Location in nature** Woodlands, the activities were provided by the Small Woods Association
Outcomes	**Quality of life measures** SF-36
Notes	

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Unclear risk	See EPHPP assessment below

Allocation concealment (selection bias)	Unclear risk	See EPHPP assessment below
Blinding of participants and personnel (performance bias) All outcomes	Unclear risk	See EPHPP assessment below
Blinding of outcome assessment (detection bias) All outcomes	Unclear risk	See EPHPP assessment below
Incomplete outcome data (attrition bias) All outcomes	Unclear risk	See EPHPP assessment below
Selective reporting (reporting bias)	Unclear risk	See EPHPP assessment below
Other bias	Unclear risk	See EPHPP assessment below
Wallce Criteria for appraising qualitative evidence	Unclear risk	Not applicable - quantitative study
EPHPP Criteria	High risk	**Component Ratings** ***A) Selection bias*** Q1) Are the individuals selected to participate in the study likely to be representative of the target population? *Not likely* Q2) What percentage of selected individuals agreed to participate? *Can't tell* **Rating (Section A): Weak** ***B) Study design*** Indicate the study design: *Before and after* Was the study described as randomised? If NO, go to component C. *No* If YES, was the method of randomisation described? If YES, was the method appropriate? **Rating (Section B): Weak** ***C) Confounders*** Q1) Were there important differences between groups prior to the intervention? *Can't tell* Q2) If YES, indicate the percentage of relevant confounders that were controlled (either in design (e.g. stratification, matching) or analysis)? **Rating (Section C): Weak** ***D) Blinding*** Q1) Was (were) the outcome assessor(s) aware of the intervention or exposure sta-

		tus of participants? *No* Q2) Were the study participants aware of the research question? *Yes* **Rating (Section D): Weak** ***E) Data collection methods*** Q1) Were data collection tools shown to be valid? *Yes* Q2) Were data collection tools shown to be reliable? No **Rating (Section E): Moderate** ***F) Withdrawals and drop-outs*** Q1) Were withdrawals and drop-outs reported in terms of numbers and/or reasons per group? *Can't tell* Q2) Indicate the percentage of participants completing the study. (If the percentage differs by groups, record the lowest). *Can't tell* **Rating (Section F): Weak** ***G) Intervention integrity*** Q1) What percentage of participants received the allocated intervention or exposure of interest? *Can't tell* Q2) Was the consistency of the intervention measured? *No* Q3) Is it likely that subjects received an unintended intervention (contamination or co-intervention) that may influence the results? *Yes* ***H) Analyses*** Q1) Indicate the unit of allocation. *Individual* Q2) Indicate the unit of analysis. *Individual* Q3) Are the statistical methods appropriate for the study design? *Yes* Q4) Is the analysis performed by intervention allocation status (i.e. intention to treat) rather than the actual intervention received? *Can't tell* **Global rating for this paper: Weak** Discrepancy between reviewers? *No* Final decision of both reviewers: Weak

Townsend 2004

Methods	**Study design** Qualitative, multi-stage project consisting of interviews and focus groups **Study period** The research was conducted in two stages, the pilot was carried out during 2002 and the main research during 2004 **Timing of the intervention** No information was given relating to the timing of the intervention but given the study design it is fair to assume it was also during the years of research **Sampling** No information was provided relating to the selection of participants for inclusion in the study, but the groups studies were relatively small and so a convenience sample was assumed **Data collection** The first stage of the research, the pilot, consisted of a review of the written information relating to the project in question (Friends of Damper Creek) as well as face-to-face interviews with members. The interviews explored length of membership, motivations and activities as well as the group as a means of promoting health and well-being The main stage of research consisted of three phases: firstly, face-to-face interviews with members of Truganina Explosives reserve in 2004. Secondly, a stage of quantitative research which did not meet the inclusion criteria for this review and so is not extracted and, thirdly, a focus group with representatives of the various stakeholders for the group **Analysis process** The analysis for the pilot was not detailed, however qualitative data for the main stage was examined using framework analysis
Participants	**Sample size** No information was provided relating to the sample size of the pilot stage Main stage, n = 18 (face-to-face interviews) and is unknown for the focus group **Country, area** Australia, Victoria and Hobson's Bay, urban **Sample characteristics** The only information relating to the sample refers to those participants interviewed for the main stage of research: 66% were aged over 65, and three were under 45; 13 were retired and two employed; 50% had been members for more than five years, seven members were highly involved, four moderately and seven stated low involvement
Interventions	**Intervention description** The pilot stage examined participants in the 'Friends of Damper Creek Inc.', who were volunteers in management and maintenance of the Damper Creek Reserve. The main study examined those dedicated to restoration, regeneration and maintenance of the site of Truganina Explosives reserve **Time frame and frequency** No information was provided relating to the time frame or frequency of the activities **Location in nature** The pilot was conducted with activities located on a nature reserve. The main study was conducted on a reserve which used to be a site for explosives transport but which is now urban parkland

Townsend 2004 (*Continued*)

Outcomes	**Themes identified** The authors identified five main themes emerging from the data: motivations, perceived benefits, health and well-being, other benefits, and potential for being an 'upstream' measure
Notes	This research was funded by the School of Health and Social Development, Deakin University

Risk of bias

Bias	**Authors' judgement**	**Support for judgement**
Random sequence generation (selection bias)	Unclear risk	Not applicable - qualitative study
Allocation concealment (selection bias)	Unclear risk	Not applicable - qualitative study
Blinding of participants and personnel (performance bias) All outcomes	Unclear risk	Not applicable - qualitative study
Blinding of outcome assessment (detection bias) All outcomes	Unclear risk	Not applicable - qualitative study
Incomplete outcome data (attrition bias) All outcomes	Unclear risk	Not applicable - qualitative study
Selective reporting (reporting bias)	Unclear risk	Not applicable - qualitative study
Other bias	Unclear risk	Not applicable - qualitative study
Wallce Criteria for appraising qualitative evidence	High risk	Is the research question clear? *Yes* Perspective of author clear? *Yes* Perspective influenced the study design? *Yes* Is study design appropriate? *Yes* Is the context adequately described? *Yes* Sample adequate to explore range of subjects/settings? *Can't tell, not enough information* Sample drawn from appropriate population? *Can't tell, little information* Data collection adequately described? *No* Data collection rigorously conducted? *Can't tell* Data analysis rigorously conducted? *Can't tell* Findings substantiated/limitations consid-

		ered? *No* Claims to generalizability follow from data? *Can't tell* Ethical issues addressed? *No*
EPHPP Criteria	Unclear risk	Not applicable - qualitative study

Townsend 2005

Methods	**Study design** Quantitative. Case-control study **Study period** No information was given relating to the study period **Timing of the intervention** No information was given relating to the timing of the intervention **Sampling** Little information was provided about the selection of participants for the study. Those in the land management groups were approached through groups involved in conservation. An equal number of 'control' participants (non-conservation group members) were matched to experimental group by age and gender. These participants were identified and approached in a variety of settings **Data collection** Again, little information was provided relating to the data collection procedure in this study. The authors state that a face-to-face delivered questionnaire instrument was used to the experimental and control group **Analysis process** Mean responses were calculated and independent sample t-tests conducted to determine significant differences between groups
Participants	**Sample size** n = 102 (51 in experimental (landcare) group and 51 in control group) **Country, area** Australia, Victoria, rural **Sample characteristics** Of the 102 participants 50% were aged between 45-64 years. Thirty-eight of the participants were female. Of the experimental group, 47% were retired, 25% self-employed, 23% employed and two were unemployed. Of the controls, 35% were retired, 31% were employed, 20% self-employed and 1% unemployed. The controls were approached in a variety of settings: libraries, senior citizens' clubs, community centres, pubs and shopping centres The experimental group had resided in the area for an average of 35.5 years, the controls for 27 years
Interventions	**Intervention description** The activity was classified as conservation and land use/care. The management of corridors of land for conservation and bio-diversity protection. Membership of these groups was voluntary **Time frame and frequency** No information was given relating to the frequency of the intervention, the only infor-

	mation provided relating to the time frame was that the members had been attached to the group for, on average, seven years **Location in nature** The activities took place in corridors of land for conservation, and were provided in collaboration with Trust for Nature
Outcomes	Note: apart from social, all outcomes were designed by the authors for this study **Physical** General health (five-point Likert scale) Taking prescription drugs (five-point Likert scale) **Mental** Problems sleeping (five-point Likert scale) Feeling anxious (five-point Likert scale) Feeling depressed (five-point Likert scale) **Quality-of-life measures** Well-being (five-point Likert scale) Annual visits to GP Experience pain or discomfort (five-point Likert scale) Satisfaction with daily activities (five-point Likert scale) Require assistance in the community (five-point Likert scale) Feel safe in the area (five-point Likert scale) Utilize life skills (five-point Likert scale) **Social measures** Scale adapted from Buckner's Neighbourhood/Community Cohesion scale P values were quoted for some of the results listed, but not for others. We were unable to calculate the remainder, data were not provided
Notes	This research was funded in collaboration with Trust for Nature

Risk of bias

Bias	**Authors' judgement**	**Support for judgement**
Random sequence generation (selection bias)	Unclear risk	See EPHPP assessment below
Allocation concealment (selection bias)	Unclear risk	See EPHPP assessment below
Blinding of participants and personnel (performance bias) All outcomes	Unclear risk	See EPHPP assessment below
Blinding of outcome assessment (detection bias) All outcomes	Unclear risk	See EPHPP assessment below
Incomplete outcome data (attrition bias) All outcomes	Unclear risk	See EPHPP assessment below

Selective reporting (reporting bias)	Unclear risk	See EPHPP assessment below
Other bias	Unclear risk	See EPHPP assessment below
Wallce Criteria for appraising qualitative evidence	Unclear risk	Not applicable - quantitative study
EPHPP Criteria	High risk	**Component Ratings** ***A) Selection bias*** Q1) Are the individuals selected to participate in the study likely to be representative of the target population? *Can't tell* Q2) What percentage of selected individuals agreed to participate? *Can't tell* **Rating (Section A): Weak** ***B) Study design*** Indicate the study design: *Case-control* Was the study described as randomised? If NO, go to component C. *No* If YES, was the method of randomisation described? If YES, was the method appropriate? **Rating (Section B): Moderate** ***C) Confounders*** Q1) Were there important differences between groups prior to the intervention? *Yes* Q2) If YES, indicate the percentage of relevant confounders that were controlled (either in design (e.g. stratification, matching) or analysis)? *80% - 100%* **Rating (Section C): Strong** ***D) Blinding*** Q1) Was (were) the outcome assessor(s) aware of the intervention or exposure status of participants? *Yes* Q2) Were the study participants aware of the research question? *Can't tell* **Rating (Section D): Moderate** ***E) Data collection methods*** Q1) Were data collection tools shown to be valid? *No* Q2) Were data collection tools shown to be reliable? *No* **Rating (Section E): Weak** ***F) Withdrawals and drop-outs*** Q1) Were withdrawals and drop-outs reported in terms of numbers and/or reasons per group? *Yes*

		Q2) Indicate the percentage of participants completing the study. (If the percentage differs by groups, record the lowest). *80% - 100%* **Rating (Section F): Strong** ***G) Intervention integrity*** Q1) What percentage of participants received the allocated intervention or exposure of interest? *Less than 60%* Q2) Was the consistency of the intervention measured? *No* Q3) Is it likely that subjects received an unintended intervention (contamination or co-intervention) that may influence the results? *Yes* ***H) Analyses*** Q1) Indicate the unit of allocation. *Individual* Q2) Indicate the unit of analysis. *Individual* Q3) Are the statistical methods appropriate for the study design? *Yes* Q4) Is the analysis performed by intervention allocation status (i.e. intention to treat) rather than the actual intervention received? *Can't tell* **Global rating for this paper: Weak** Discrepancy between reviewers? *No* Final decision of both reviewers: Weak

Townsend 2006

Methods	**Study design** Qualitative. Three stage study (examining three EECA projects) using semi-structured face to face interviews at each stage **Study period** Three projects are reported on in this study, the first took place in 2002, the second in 2004 and no information is given as to the timing of the third project **Timing of intervention** No information is given relating to the time frame for any of the three project stages reported **Sampling** The first two stages reported on projects where the recruitment of participants was not clear. Limited information was given relating to the third stage recruitment process, however purposive (judgemental) sampling was used to select a range of individuals involved in each of the Trust for Nature groups. This process was guided by Trust for Nature staff **Data collection** No further information was given relating to the data collection stages, only described as semi-structured face-to-face interviews **Analysis process** No description of the analysis process was given, however themes are outlined in the discussion sections and so thematic analysis is presumed
Participants	**Sample size** Three projects were examined and the sample size for each stage reported was: 1. n = 11 2. n = 18 3. n = 51 **Country, area** Australia, with the three projects being located in: 1. Melbourne, 2. City of Hobsons Bay, 3. Victoria **Sample characteristics** No information is given relating to the participants in the three projects examined for this study
Interventions	**Intervention description** The three projects consisted of: 1. Friends of Damper Creek, the management and maintenance of Damper Creek Reserve, a small linear park 2. Truganina Explosives Reserve Preservation Society, involved in the planning, development and maintenance of the reserve 3. Trust for Nature, a community-based conservation organisation focusing on the protection of private land of high conservation value No other details were given relating to the actual activities undertaken by participants **Time frame and frequency** For the first project, activities were undertaken mostly at weekends, though with some weekdays included. No information was given relating to the timeframe or frequency of the second two projects included in the study **Location in nature** The locations of activities included in the study were described as 'mixed'

Outcomes	**Themes identified** The three overarching themes identified by the author were physical health impacts, mental health impacts and social impacts of undertaking activities
Notes	The research was funded by Parks Victoria, the People and Parks Foundation, Alcoa World Alumina Australia, the Helen Macpherson Smith Trust, the Victorian Department of Sustainability and Environment, Trust for Nature, Barwon Health, Angair, Surf Coast Shire and the City of Hobsons Bay It was stated by the author that there was an intention to improve this study by developing an RCT to explore these health issues in greater detail

Risk of bias

Bias	**Authors' judgement**	**Support for judgement**
Random sequence generation (selection bias)	Unclear risk	Not applicable - qualitative study.
Allocation concealment (selection bias)	Unclear risk	Not applicable - qualitative study
Blinding of participants and personnel (performance bias) All outcomes	Unclear risk	Not applicable - qualitative study
Blinding of outcome assessment (detection bias) All outcomes	Unclear risk	Not applicable - qualitative study
Incomplete outcome data (attrition bias) All outcomes	Unclear risk	Not applicable - qualitative study
Selective reporting (reporting bias)	Unclear risk	Not applicable - qualitative study
Other bias	Unclear risk	Not applicable - qualitative study
Wallce Criteria for appraising qualitative evidence	High risk	Is the research question clear? *No, no question is stated* Perspective of author clear? *Yes* Perspective influenced the study design? *Yes* Is study design appropriate? *Yes* Is the context adequately described? *Yes* Sample adequate to explore range of subjects/settings? Can't tell, not enough information Sample drawn from appropriate population? *Can't tell, little information* Data collection adequately described? *No* Data collection rigorously conducted?

Townsend 2006 (*Continued*)

		Can't tell Data analysis rigorously conducted? *Can't tell, no detail given* Findings substantiated/limitations considered? *No, no consideration given to limitations* Claims to generalizability follow from data? *No* Ethical issues addressed? *No*
EPHPP Criteria	Unclear risk	Not applicable - qualitative study

Wilson 2009

Methods	**Study design** Mixed methods, uBA and a qualitative element (interviews and focus groups) **Study period** The study ran parallel to the intervention **Timing of intervention** The intervention ran for a total of 12 weeks **Sampling** The quantitative element of the research consisted of individuals who were referred through a professional support service and probation and were given the option to opt in to the study during the referral process. The qualitative element of the research was split into two, interviews and focus groups. Participants for interviews were selected at random from clients who had consented to take part in this aspect of the evaluation. A maximum of three interviews was conducted with each group and were between the 7th and 12th weeks of individuals being enrolled on the programme. No information was given about selection of participants for the focus groups **Data collection** Quantitative data were collected using a pre- and post-assessment of health and well-being through a questionnaire. Qualitative data were collected using two methods. Firstly, semi-structured interviews were conducted with participants using a schedule constructed in line with psychological methodology. Focus groups were conducted with project officers and other members of the referral process **Analysis process** Quantitative data were analysed using basic summative statistics and paired maple t-tests to explore the differences between baseline and post-activity scores. Qualitative data underwent thematic analysis using a phenomenological approach. Each transcript was read repeatedly, points of interest were noted and emerging themes were recorded. Each transcript was examined before the total list of themes was produced (in order to consider each transcript afresh). Following this initial thematic coding, emergent themes were grouped into categories in which related items were listed together with the source from which the data was obtained. Cateogry titles were then established as a master theme under which these related groups of (subservient) themes were organised. In many cases, the title of the category was taken from a theme which helped to explain and organise the other themes. Themes were then sub-divided into those relating to client outcomes and those which related to service logistics. The themes relating to client outcomes underwent a further layer of analysis. A code denoting each master theme was produced. Each transcript was then re-examined and the code donating each theme was written in the margin aligned with the text matter relating to that theme. All the matter from the transcripts relating to each theme was then extracted and grouped under each theme. The themes were then modified (where appropriate) in the light of this information
Participants	**Sample size** Quantitative element, n = 77 Qualitative element, n = 37 (29 clients and eight referral process individuals) **Country, area** Scotland, Glasgow and Clyde, mixed rural and urban **Sample characteristics** The mean age of the quantitative sample was 41.2 years (the youngest was 21, oldest was 61), 26% were female. There were some participants who were unemployed but no figure was given. The attrition rates for this stage of the research was: non-completers, 3 and the mean attendance was 2.15 weeks. There were 77 completers with a mean attendance

	of 9.8 weeks. No further information was provided on the sample characteristics of those included in the qualitative section
Interventions	**Intervention description** During the 12-week programme, clients took part in a variety of activities including health walks, environmental art, conservation, bushcraft skills and relaxation. The sessions were run by an experienced Forestry Commission Ranger and Assistant Ranger, with input from session workers such as an environmental artist and Tai Chi instructor. Activities included: non-native and invasive species were removed including large areas of rhododendron and broom; removing unwanted tree seedlings and transplanting oak. ; young and overgrown orchard in Carmunnock was restored and re-established by removing invasive willow herb, pruning, and mulching the area (programme also included some outdoor education e.g., map reading, construction using materials such as willow and a health walk to the site, art work, social engagement) **Time frame and frequency** The programme lasted 12 weeks, and participants engaged with activities for three hours per week **Location in nature** The activities took place in woodland, and were provided by the Forestry Commisison Scotland and contracted specialists
Outcomes	**Physical** Scottish Physical Activity Questionnaire (SPAQ) **Mental** Warwick-Edinburgh Mental Well-being Scale (WEMWBS) **Quality of life measures** SF-12 **Themes identified** The authors identified seven themes through their analysis of the qualitative data: improvements to mental well-being; increased confidence; increased self-esteem; improvements to physical health; provision of daily structure; transferable skill acquisition; and social networking
Notes	This research was funded through the Forestry Commission Scotland, Glasgow and Clyde Valley Green Network Partnership, NHS Greater Glasgow and Clyde, Glasgow Centre for Population Health, and Glasgow City Council

Risk of bias

Bias	**Authors' judgement**	**Support for judgement**
Random sequence generation (selection bias)	Unclear risk	See EPHPP assessment below
Allocation concealment (selection bias)	Unclear risk	See EPHPP assessment below
Blinding of participants and personnel (performance bias) All outcomes	Unclear risk	See EPHPP assessment below

Blinding of outcome assessment (detection bias) All outcomes	Unclear risk	See EPHPP assessment below
Incomplete outcome data (attrition bias) All outcomes	Unclear risk	See EPHPP assessment below
Selective reporting (reporting bias)	Unclear risk	See EPHPP assessment below
Other bias	Unclear risk	See EPHPP assessment below
Wallce Criteria for appraising qualitative evidence	High risk	Is the research question clear? *Yes* Perspective of author clear? *Can't tell* Perspective influenced the study design? *Can't tell* Is study design appropriate? *Yes* Is the context adequately described? *Yes* Sample adequate to explore range of subjects/settings? *Yes* Sample drawn from appropriate population? *Yes* Data collection adequately described? *No* Data collection rigorously conducted? *Can't tell* Data analysis rigorously conducted? *Yes* Findings substantiated/limitations considered? *Yes* Claims to generalizability follow from data? *Can't tell* Ethical issues addressed? *Yes*
EPHPP Criteria	High risk	**Component Ratings** ***A) Selection bias*** Q1) Are the individuals selected to participate in the study likely to be representative of the target population? *Somewhat likely* Q2) What percentage of selected individuals agreed to participate? *Can't tell* **Rating (Section A): Weak** ***B) Study design*** Indicate the study design: *Before and after* Was the study described as randomised? If NO, go to component C. *No* If YES, was the method of randomisation described? If YES, was the method appropriate? **Rating (Section B): Weak** ***C) Confounders*** Q1) Were there important differences be-

		tween groups prior to the intervention? *Can't tell* Q2) If YES, indicate the percentage of relevant confounders that were controlled (either in design (e.g. stratification, matching) or analysis)? *Can't tell* **Rating (Section C): Weak** ***D) Blinding*** Q1) Was (were) the outcome assessor(s) aware of the intervention or exposure status of participants? *Yes* Q2) Were the study participants aware of the research question? *Yes* **Rating (Section D): Weak** ***E) Data collection methods*** Q1) Were data collection tools shown to be valid? *Yes* Q2) Were data collection tools shown to be reliable?**No** **Rating (Section E): Moderate** ***F) Withdrawals and drop-outs*** Q1) Were withdrawals and drop-outs reported in terms of numbers and/or reasons per group? *No* Q2) Indicate the percentage of participants completing the study. (If the percentage differs by groups, record the lowest). *60% - 79%* **Rating (Section F): Weak** ***G) Intervention integrity*** Q1) What percentage of participants received the allocated intervention or exposure of interest? *Can't tell* Q2) Was the consistency of the intervention measured? *No* Q3) Is it likely that subjects received an unintended intervention (contamination or co-intervention) that may influence the results? *Yes* ***H) Analyses*** Q1) Indicate the unit of allocation. *Individual* Q2) Indicate the unit of analysis.*Individual* Q3) Are the statistical methods appropriate for the study design? *Yes* Q4) Is the analysis performed by intervention allocation status (i.e. intention to

		treat) rather than the actual intervention received? *Can't tell* **Global rating for this paper: Weak** Discrepancy between reviewers? *No* Final decision of both reviewers: Weak

Yerrell 2008

Methods	**Study design** Quantitative. uBA **Study period** The study ran parallel to the intervention, 2003 - 2007 **Timing of the intervention** The intervention under scrutiny in this study ran for a total of three months between 2003 - 2007 **Sampling** Green Gym project leaders recruited members directly to the study. Recruitment onto the continuation questionnaire was after three months **Data collection** Questionnaires were distributed to members of the Green Gym groups by session leaders, continuation questionnaires were then distributed to those still with the programme after three months **Analysis process** Data were entered into SPSS and analyses included comparative Likert analysis, paired sample t-tests, linear regression (including multiple regression) and Chi^2 analysis
Participants	**Sample size** n = 194 (703 initially, 194 completed the study) **Country, area** UK, England/Northern Ireland/Scotland/Wales **Sample characteristics** The age range of the participants was 18 - 75+ years, with 80% falling between 25 - 64; 40% of the sample were female, 97% were 'White' and 71% were unemployed or retired; 56% of the female participants held a degree and 82% of the men had no formal qualifications; 665 of the 'living-alone' category were men. Only 32% of the sample had conducted any kind of conservation work prior to the Green Gym. 37% of the participants were referred
Interventions	**Intervention description** Activities were undertaken at 52 Green Gym locations around the UK: 'opportunity to work out in the open air through local, practical environmental or gardening work' **Time frame and frequency** Participants undertook activities for between one to four hours on a weekly basis for an average of three months **Location in nature** Activities were conducted in various locations and were provided by BTCV

Outcomes	**Quality of life measures** SF-12 version 2 (Physical Component Summary Score: PCS and Mental Component Summary Score: MCS) A self-reported physical activity inventory was translated into Metabolic Equivalent Tasks (METs) was included as a measure of energy expenditure **Other** The motivations for joining the Green Gym were also examined
Notes	This research was funded by the School of Health and Social Care, Oxford Brookes University

Risk of bias

Bias	**Authors' judgement**	**Support for judgement**
Random sequence generation (selection bias)	Unclear risk	See EPHPP assessment below
Allocation concealment (selection bias)	Unclear risk	See EPHPP assessment below
Blinding of participants and personnel (performance bias) All outcomes	Unclear risk	See EPHPP assessment below
Blinding of outcome assessment (detection bias) All outcomes	Unclear risk	See EPHPP assessment below
Incomplete outcome data (attrition bias) All outcomes	Unclear risk	See EPHPP assessment below
Selective reporting (reporting bias)	Unclear risk	See EPHPP assessment below
Other bias	Unclear risk	See EPHPP assessment below
Wallce Criteria for appraising qualitative evidence	Unclear risk	Not applicable - quantitative study
EPHPP Criteria	High risk	**Component Ratings** ***A) Selection bias*** Q1) Are the individuals selected to participate in the study likely to be representative of the target population? *Not likely* Q2) What percentage of selected individuals agreed to participate? *Can't tell* **Rating (Section A): Weak** ***B) Study design*** Indicate the study design: *Before and after*

		Was the study described as randomised? If NO, go to component C. *No* If YES, was the method of randomisation described? If YES, was the method appropriate? **Rating (Section B): Weak** ***C) Confounders*** Q1) Were there important differences between groups prior to the intervention? *Can't tell* Q2) If YES, indicate the percentage of relevant confounders that were controlled (either in design (e.g. stratification, matching) or analysis)? *60% - 79%* **Rating (Section C): Moderate** ***D) Blinding*** Q1) Was (were) the outcome assessor(s) aware of the intervention or exposure status of participants? *Yes* Q2) Were the study participants aware of the research question? *Can't tell* **Rating (Section D): Weak** ***E) Data collection methods*** Q1) Were data collection tools shown to be valid? *Yes* Q2) Were data collection tools shown to be reliable? *Yes* **Rating (Section E): Strong** ***F) Withdrawals and drop-outs*** Q1) Were withdrawals and drop-outs reported in terms of numbers and/or reasons per group? *Yes* Q2) Indicate the percentage of participants completing the study. (If the percentage differs by groups, record the lowest). *Less than 60%* **Rating (Section F): Weak** ***G) Intervention integrity*** Q1) What percentage of participants received the allocated intervention or exposure of interest? *80% - 100%* Q2) Was the consistency of the intervention measured? *No* Q3) Is it likely that subjects received an unintended intervention (contamination or co-intervention) that may influence the results? *Yes*

		H) Analyses Q1) Indicate the unit of allocation. *Organisation* Q2) Indicate the unit of analysis.*Individual* Q3) Are the statistical methods appropriate for the study design? *Yes* Q4) Is the analysis performed by intervention allocation status (i.e. intention to treat) rather than the actual intervention received? *Can't tell* **Global rating for this paper: Weak** Discrepancy between reviewers? *No* Final decision of both reviewers: Weak

Characteristics of excluded studies *[ordered by study ID]*

Study	Reason for exclusion
Ahokumpu 2010	Not empirical research meeting inclusion criteria
Alston 2010	Not EECA includable activity
Ambrose-Oji 2010	Not empirical research meeting inclusion criteria
Ambrose-Oji 2011	Not empirical research meeting inclusion criteria
Anonymous 2010a	Unobtainable
Anonymous 2010b	Unobtainable
Archer 2007	Not empirical research meeting inclusion criteria
Asah 2013	No reporting of health outcomes
Asah 2014	Not empirical research meeting inclusion criteria
Asken 2009	Not EECA includable activity
Austin 2002	No reporting of health outcomes
Austin 2003	Not EECA includable activity
Ayalon 2008	Not EECA includable activity
Baker 2005	Not empirical research meeting inclusion criteria

(*Continued*)

Barlett 2005	No reporting of health outcomes
Barton 2010	Not EECA includable location
Bellotti 2011	Not EECA includable activity
Big Lottery Fund undated	Not EECA includable activity
Bingley 2013	Not EECA includable activity
Binley 2008	Not empirical research meeting inclusion criteria
Bird 2007	Not empirical research meeting inclusion criteria
Black 2009	No reporting of health outcomes
Blackman 2007	Not empirical research meeting inclusion criteria
Blackwater Valley Countryside 2010	Not empirical research meeting inclusion criteria
Blanusa 2011	Not EECA includable location
Bomford 1990	Not empirical research meeting inclusion criteria
Boswell 2012	Not empirical research meeting inclusion criteria
Bragg 2013	Not EECA includable activity
Bramston 2011	Not empirical research meeting inclusion criteria
Brown 2012	Not EECA includable activity
Browning 2005	Not empirical research meeting inclusion criteria
Browning 2007	Not empirical research meeting inclusion criteria
Bruyere 2007	Not empirical research meeting inclusion criteria
BTCV 2008	Not empirical research meeting inclusion criteria
BTCV 2009	Included children
BTCV 2010b	Not empirical research meeting inclusion criteria
BTCV 2010c	Not empirical research meeting inclusion criteria
BTCV 2012	Not empirical research meeting inclusion criteria

(*Continued*)

BTCV undated	Not empirical research meeting inclusion criteria
Bullock 2008	Not EECA includable activity
Burls 2005	Not empirical research meeting inclusion criteria
Bush 2012	Not EECA includable activity
Bwika 2011	Not EECA includable activity
Cairley undated	Not empirical research meeting inclusion criteria
Calder 2004	Not empirical research meeting inclusion criteria
Carter 2009	Not empirical research meeting inclusion criteria
Carter 2009a	Not EECA includable activity
Carter 2010	Not empirical research meeting inclusion criteria
Carter 2011	Not EECA includable activity
Casiday undated	Not EECA includable activity
CfW 2006	Not EECA includable activity
CfW 2010	Not empirical research meeting inclusion criteria
CfW 2011	Not EECA includable activity
CfW 2012	Not EECA includable activity
CfW undated	Not EECA includable activity
Chambers 2008	Not empirical research meeting inclusion criteria
Chaplin 2002	Not empirical research meeting inclusion criteria
Chateau 2011	Not EECA includable activity
Children's Food Campaign 2010	Not empirical research meeting inclusion criteria
Church 2007a	Not empirical research meeting inclusion criteria
Church 2007b	Not empirical research meeting inclusion criteria

(*Continued*)

Clift 2012	Not EECA includable activity
Coles 2011	Not EECA includable activity
Community 2012	Not EECA includable activity
Cousins 2009	Not EECA includable activity
CSV 2009	Not empirical research meeting inclusion criteria
CSV 2011	Insufficient methodological information
CVNI 2010	Not empirical research meeting inclusion criteria
Danks 2009	Not EECA includable activity
Davies 2007	Not empirical research meeting inclusion criteria
De Coster 2014	Not empirical research meeting inclusion criteria
Dickie 2005	Not empirical research meeting inclusion criteria
Dillon 2012	Not EECA includable activity
Edwards 2009	No reporting of health outcomes
Elliott undated	Not empirical research meeting inclusion criteria
Endaf 2010	Not empirical research meeting inclusion criteria
England 2009	Not EECA includable activity
Europarc 2010	Not empirical research meeting inclusion criteria
FCS 2008	Not empirical research meeting inclusion criteria
FCS 2009	Not empirical research meeting inclusion criteria
Flannigan 2011	Not EECA includable activity
Forestry Commission Wales 2008	No reporting of health outcomes
Forster 1990	Not empirical research meeting inclusion criteria
Freestone 2008	Not EECA includable activity

(*Continued*)

Fullilove 2011	Not empirical research meeting inclusion criteria
Garnett 1996	Not EECA includable activity
Gerdes 2011	Not EECA includable activity
Gill 1995	Not EECA includable activity
GLA 2011	Not empirical research meeting inclusion criteria
Goodenough 2011	Not empirical research meeting inclusion criteria
Goodwin 1997	No reporting of health outcomes
Graham 2011	Not empirical research meeting inclusion criteria
Green 2010	Not empirical research meeting inclusion criteria
Grese 2000	Not empirical research meeting inclusion criteria
Griffiths 2011	Not empirical research meeting inclusion criteria
Grunberger 2011	Not EECA includable activity
Guiney 2009	Not EECA includable activity
Guiney 2010	Not EECA includable activity
Haddow undated	Unobtainable
Hall 2004	Not empirical research meeting inclusion criteria
Halliwell 2005	Not EECA includable location
Hamilton 2013	Not empirical research meeting inclusion criteria
Haste undated	Not empirical research meeting inclusion criteria
Henley 2005	Not EECA includable activity
Hill 2009	Not empirical research meeting inclusion criteria
Hill 2012	No reporting of health outcomes
Hill undated	Not empirical research meeting inclusion criteria
Hine 2008a	Not EECA includable activity

(*Continued*)

Hine 2008b	No reporting of health outcomes
Hopkins 2005	Not empirical research meeting inclusion criteria
Hopkins 2006	Not empirical research meeting inclusion criteria
Hosking undated	Not empirical research meeting inclusion criteria
Hunt 2010	Not empirical research meeting inclusion criteria
Hynds 2011	Not EECA includable activity
Hynds 2012	Not EECA includable activity
Icarus 2011a	Not empirical research meeting inclusion criteria
Icarus 2011b	Not empirical research meeting inclusion criteria
IfV 1997	Not empirical research meeting inclusion criteria
IfV 2008	Not empirical research meeting inclusion criteria
IfV undated	Not empirical research meeting inclusion criteria
Interface 2004	Not EECA includable activity
Jenkins 2008	Not empirical research meeting inclusion criteria
Jepson 2010	Not empirical research meeting inclusion criteria
Jepson 2010a	Not empirical research meeting inclusion criteria
Johnston 2011	Not empirical research meeting inclusion criteria
Jones 2010	Not EECA includable activity
Kaiser 2011	Not EECA includable activity
Keep Wales Tidy 2011	Not empirical research meeting inclusion criteria
Kegg 2005	Not empirical research meeting inclusion criteria
Key 2011	Not empirical research meeting inclusion criteria
King 2000	Not empirical research meeting inclusion criteria

(*Continued*)

Kingsley 2006	Not EECA includable activity
Kingsley 2009	Not EECA includable activity
Knott 2004	No reporting of health outcomes
Koss 2010	Not empirical research meeting inclusion criteria
Krasny 2012	Not empirical research meeting inclusion criteria
Lawrence 2009	Not empirical research meeting inclusion criteria
Lawrence 2009a	No reporting of health outcomes
Lawrence 2011	Not EECA includable activity
Lawrence 2011a	Not empirical research meeting inclusion criteria
Le Bas 2008	Unobtainable
Lee 1997	Not empirical research meeting inclusion criteria
Librett 2005	Not empirical research meeting inclusion criteria
Lindsay 2006	Not empirical research meeting inclusion criteria
Liu 2003	Not empirical research meeting inclusion criteria
London WT 2004	Not empirical research meeting inclusion criteria
LWC 2012	Not empirical research meeting inclusion criteria
Mackay 2010	Not EECA includable activity
Macpherson 2011	Not empirical research meeting inclusion criteria
Makra 1990	Not empirical research meeting inclusion criteria
Malcolm 2011	Unobtainable
Maller 2005b	Not EECA includable activity
Maller 2008	Not empirical research meeting inclusion criteria
Margaret 2004	No reporting of health outcomes
Marshall 2011	Not empirical research meeting inclusion criteria

(*Continued*)

McClelland 2008	Unobtainable
McCormick 2010	No reporting of health outcomes
McEwan 2011	Not empirical research meeting inclusion criteria
McLean 2004	Not EECA includable activity
Measham 2008	No EECA includable activity
Miles 1998	Not empirical research meeting inclusion criteria
Miles 2000	Not empirical research meeting inclusion criteria
Miller 2002	Included children
Mills 2001	Not empirical research meeting inclusion criteria
Mind 2007	Not EECA includable activity
Mitchell 2008	Not EECA includable activity
Moor 2011	No reporting of health outcomes
Morris 2006	Not EECA includable activity
Morris 2011	Not EECA includable activity
Morrow-Howell 2003	Not EECA includable activity
Mosher 2008	Not empirical research meeting inclusion criteria
Moss 2012	Not empirical research meeting inclusion criteria
Nath 1994	Not empirical research meeting inclusion criteria
Natural England undated a	Not empirical research meeting inclusion criteria
Natural England undated b	Not empirical research meeting inclusion criteria
Natural England undated c	Not EECA includable activity
Natural Heritage 2004	Not empirical research meeting inclusion criteria
Nazroo 2012	Not EECA includable activity
NEF 2005	Not empirical research meeting inclusion criteria

(*Continued*)

Nehring 1995	Not empirical research meeting inclusion criteria
Newlands 2008a	Not EECA includable activity
Newlands 2008b	Not EECA includable activity
Newlands 2008c	Not EECA includable activity
Newlands 2008d	Not EECA includable activity
Newlands 2008e	Not EECA includable activity
Newlands 2008f	Not EECA includable activity
Newlands 2008g	Not EECA includable activity
Newlands 2008h	Not EECA includable activity
Newlands 2008i	Not EECA includable activity
Nilsson 2006	Not empirical research meeting inclusion criteria
Nilsson 2011	Not empirical research meeting inclusion criteria
Nordh 2009	Not EECA includable activity
NWKCP 2012	Not empirical research meeting inclusion criteria
O'Brien 1996	Not empirical research meeting inclusion criteria
O'Brien 2004	Not EECA includable activity
O'Brien 2005	Not EECA includable activity
O'Brien 2006a	Not EECA includable activity
O'Brien 2006b	Not EECA includable activity
O'Brien 2006c	Not EECA includable activity
O'Brien 2006d	Not EECA includable activity
O'Brien 2007	Not EECA includable activity
O'Brien 2010	Not EECA includable activity

(*Continued*)

O'Brien 2011a	Not EECA includable activity
O'Brien 2011b	No reporting of health outcomes
O'Brien undated	No reporting of health outcomes
Ockenden 2007	Not empirical research meeting inclusion criteria
Ockenden 2008	No reporting of health outcomes
Ockenden 2009	Not empirical research meeting inclusion criteria
OECD 2001	Not empirical research meeting inclusion criteria
Ohmer 2009	Not EECA includable activity
Ojala 2007	No reporting of health outcomes
OPENspace 2010	Not EECA includable activity
Orsini 1996	No reporting of health outcomes
Orton 2008	Not EECA includable activity
Osprey 2012	Insufficient methodological information
Owen 2008	Not empirical research meeting inclusion criteria
Page 2012	Not EECA includable activity
Palmer undated	Not empirical research meeting inclusion criteria
Passy 2010	Not EECA includable activity
Pati 2010	Not empirical research meeting inclusion criteria
Patrick 2011	Not EECA includable activity
Peacock 2007	Not EECA includable activity
Perlaviciute 2011	Not EECA includable activity
Pillemer 2008	Not empirical research meeting inclusion criteria
Pinder 2009	Not EECA includable activity

(*Continued*)

Pir 2009	Not EECA includable location
Pollard 2009	Not empirical research meeting inclusion criteria
Pretty 2003	Not EECA includable activity
Quayle 2008	Not EECA includable activity
Qureshi undated	Not empirical research meeting inclusion criteria
Ralston 2005	No reporting of health outcomes
Randler 2005	Not EECA includable activity
Raske 2010	Not EECA includable location
Rawcliffe 2009	Not EECA includable activity
Reeves 2010	Not empirical research meeting inclusion criteria
Reid 2011	Not EECA includable activity
Reilly 2007	Not empirical research meeting inclusion criteria
Reilly 2009	Not EECA includable activity
Reilly 2011	No reporting of health outcomes
Reynolds 1999	Not empirical research meeting inclusion criteria
Reynolds 2000	Not empirical research meeting inclusion criteria
RHS 2011	Not EECA includable activity
Richardson 2009	Not empirical research meeting inclusion criteria
Ridgers 2010a	Not EECA includable activity
Ridgers 2010b	Not EECA includable activity
Ridgers 2012	Not EECA includable activity
Roth 2004	Unobtainable
RSPB 2012	Not EECA includable activity
Rural Institute 2009	Not EECA includable activity

(*Continued*)

Russell 2000	Not empirical research meeting inclusion criteria
Russell 2009	Not empirical research meeting inclusion criteria
Ryan 2005	Not empirical research meeting inclusion criteria
Sally 2008a	Not empirical research meeting inclusion criteria
Sally 2008b	Not EECA includable activity
Sally 2008c	Not EECA includable activity
Scottish Gvmnt 2007	Not empirical research meeting inclusion criteria
Sempik undated	Not empirical research meeting inclusion criteria
Sheldon 2009	Not EECA includable activity
Silva 2012	Not EECA includable activity
Sinclair 2007	Not empirical research meeting inclusion criteria
Small Woods 2009	Insufficient methodological information
Small Woods 2010	Insufficient methodological information
Small Woods 2011b	Not empirical research meeting inclusion criteria
Small Woods 2012	Not EECA includable activity
SNH 2006	Not EECA includable activity
SNH 2010	Not empirical research meeting inclusion criteria
SNH 2011a	Not empirical research meeting inclusion criteria
SNH 2011b	Not EECA includable activity
SNH 2012	Insufficient methodological information
SNH undated	Insufficient methodological information
Snowdon 2006	Not EECA includable activity
Son 2007	Not empirical research meeting inclusion criteria

(*Continued*)

Stacy-Marks undated	Not empirical research meeting inclusion criteria
Stevens 2011	Not EECA includable activity
Stewart 2010	Not EECA includable activity
Stewart undated	Not EECA includable activity
Stigsdotter 2011	Not empirical research meeting inclusion criteria
Sutcliffe 2011	No reporting of health outcomes
Svendsen 2011	Not empirical research meeting inclusion criteria
Swan 1993	Not empirical research meeting inclusion criteria
The Youth Foundat undated	Not empirical research meeting inclusion criteria
Thrive 2011	Not EECA includable activity
Tickle 2010	Not empirical research meeting inclusion criteria
Timmins 2006	Not EECA includable activity
Townsend 2010	Not empirical research meeting inclusion criteria
Urban Environment P 2000	No reporting of health outcomes
US AEPI 2011	Not empirical research meeting inclusion criteria
US AEPI 2012	Not empirical research meeting inclusion criteria
Vachta 2002	No reporting of health outcomes
Verma 2010	Not EECA includable activity
Volunteer Cornwall 2011	Not empirical research meeting inclusion criteria
Wavehill 2009	Not EECA includable activity
WCVA 2012	Insufficient methodological information
WMCP 2008	Not EECA includable activity
Wouters 2011	No reporting of health outcomes

(*Continued*)

Wright 2000	Not empirical research meeting inclusion criteria
WTL 2009	Not empirical research meeting inclusion criteria

DATA AND ANALYSES

This review has no analyses.

ADDITIONAL TABLES

Table 1. Evidence summary

Evidence summary - Quantitative evidence
10 studies (eight uncontrolled before and after (uBA) studies, one retrospective cohort, one case-control study). Study designs were relatively weak and could not determine causality. The quality of the evidence was also poor (all studies rated as 'Weak' using the EPHPP tool).
Physiological outcomes
One study examined physiological outcomes, with the majority of measures reporting inconclusive outcomes, or showing no health impact of participation. The uBA, focusing on British Green Gym volunteers, found an increase in grip strength following participation
Physical health outcomes
We did not identify any studies including physical health outcomes
Mental and emotional outcomes
Five studies considered mental and emotional outcomes and results were equivocal, with no clear pattern. Three studies (UK, Canada & Australia) found some evidence of improvement in mental health. However most of the evidence (from four studies) was inconclusive and one Australian comparative study found greater anxiety amongst the environmental volunteers than non-environmental volunteers
Quality of life outcomes
Eight studies assessed quality of life - results were inconclusive; 2/6 studies (both UK) using the validated SF36 scale found some positive improvements following participation, one UK study found a negative change in mental health. Other results were inconclusive. Evidence from the three studies (UK, Canada & Australia) using other quality of life measures was also mixed
Physical activity outcomes
Two studies (UK & Canada) considered physical activity and showed positive results, with increases in activity post participation and greater activity amongst environmental volunteers compared to others in a retrospective cohort study
Social outcomes
One Australian study considered social outcomes - results were largely inconclusive. Some indicators of social well-being were significantly greater amongst environmental volunteers than a control group. However, for the majority of indicators, there was no statistically significant variation

APPENDICES

Appendix 1. Expert Advisory Group and Project Reference Group

The review authors convened an Expert Advisory Group, whose primary role was to act as critical friends for the review methods. Each member brought distinct expertise to the project and provided regular email advice as well as commenting on previous versions of the protocol and full review manuscripts.

We convened a Project Reference Group (PRG) in an advisory capacity, which was comprised of those actively involved (e.g. leading or funding activities) in environmental enhancement and conservation activities. Included were representatives from a wide range of key organisations such as the Conservation Volunteers, Mind, Local Authorities and Groundwork. The group was populated through direct author contacts, web searches and snowball contacting. Due to the necessity of physical meetings the participants were representatives from UK-based national and local organisations.

The group contributed to:

- sharing knowledge of organisations involved in relevant schemes and the nature of these activities;
- ensuring we had a comprehensive picture of the research and evaluations that had been undertaken in this area (especially the grey literature);
- ensuring that we were appropriately conceiving the anticipated benefit of participation across different groups and how these are achieved (programme theories); and
- providing feedback on the results of the review, synthesis approach and the various iterations of the conceptual framework.

The PRG was convened at an initial meeting in summer 2012, at which the authors explained the purpose and scope of the project. We convened a second meeting of the PRG in early 2013 where we presented our initial results, an updated conceptual framework and also discussed the opportunities for dissemination to a range of non-academic audiences. We also took feedback at this session around the evidence base and how it compared to the PRG members' experience.

Appendix 2. Definitions of study designs

Randomised controlled trial (RCT)

A trial where participants (or clusters) are randomly allocated to receive either intervention or control. If well implemented, randomisation should ensure that intervention and control groups only differ in their exposure to treatment.

Cluster randomised controlled trial

A trial where the unit of randomisation is a cluster of participants (for example, a school). See randomised controlled trial (RCT).

Controlled before-and-after (CBA) study

A trial where participants (or clusters) are allocated to receive either intervention or control (or comparison intervention) but the allocation is not randomised.

Interrupted time series

An approach in which multiple (more than two) observations are made on the same individuals, or groups of individuals, over time.

Cohort studies

An observational study in which a group or 'cohort' of people are observed over time in order to see who develops the outcome of interest. An approach that is often called a longitudinal study. Cohort studies differ from experimental studies such as randomised or non-randomised controlled trials because individuals effectively allocate themselves according to the extent of their exposure to the risk factor of interest. Prospective cohort studies involve following groups of people forward in time to assess who develops the outcome of interest, often by conducting a series of cross-sectional studies. Conversely, in retrospective cohort studies, both the exposure and outcomes of interest all take place in the past relative to the starting point of the study.

Case-control studies

A comparative observational study in which the investigator selects people who have an outcome of interest (for example, developed a disease) and others who have not (controls), and then collects data to determine previous exposure to possible causes. Case-control studies are often reserved for early hypothesis testing or for investigating the causes of rare outcomes.

(Uncontrolled) Before-and-after studies

An approach where the dependent variables are measured before and after an intervention has been delivered. The intervention can either be delivered by the investigator or by others (observational before and after study). An approach that is often called a pre-post study. Study participants in pre- and post-intervention stages can either be the same (A) - as is often the case for simple one-to-one intervention studies - or different (B) - as is often the case for assessing large scale interventions.

Derived from NICE 2009

Appendix 3. Search syntax

Database(s): Ovid MEDLINE(R)
Host: OVID
Data Parameters: 1946 to September Week 3 2012
Date Searched: Wednesday October 3rd 2012
Searched By: CC
Strategy Checked by: KH, RL and RG

Search Strategy

#	Searches	Results
1	(conservation$ and natural and environment$ and (renewal or volunteer$ or voluntary or participat$ or practical or regenerat$ or restor$ or maintain$ or care or enhance$ or preserve or creat$ or activ$ or action$ or involve$)).ti,ab	377
2	(Conservation adj3 interventions).ti,ab.	29
3	((environmental$ adj3 (conservation$ or volunteer$ or steward$)) and (Regenerat$ or restore or restoration or redevelop or maintain or enhance or preserve or preserving or create or creation or establish or establishing or founding or build$ or cultivat$ or cultivation or participate or participation)).ti,ab	73
4	(conservation$ adj3 (group$ or volunteer$ or voluntary or association$ or organisation$ or organization$ or participa$ or stakeholder$ or steward$ or trust or ranger$ or activit$)).ti,ab	747
5	(conservation$ adj5 (nature or rural or countryside or outdoor$ or outside or backcountry or hinterland or outback or wood$ or park$1 or parkland or garden$ or meadow$ or farm$ or (farm adj1 land) or horticultural or floricultural or botanical or arboretum or allotment$ or forest$ or rainforest or moor$ or dale$1 or marsh$ or mountain$ or beach$ or wilderness or landscape$ or tree$ or copse$ or river$ or lake$ or canal$ or waterway or wetland$ or (open adj1 space$) or (protected adj1 area$) or green$ or planning$ or footpath$ or trail$ or coast$ or cliff$ or dune$ or (bio adj1 diversity) or (eco adj1 system) or (protected adj1 area$))).ti,ab	1688
6	(geoconservation or (geo adj3 conservation)).ti,ab.	0
7	((activ$ or practical or participat$) adj3 conservation$).ti,ab	481

(*Continued*)

8	exp "Conservation of Natural Resources"/ or *Environment/ or *Environment Design/	42248
9	(volunteer$ or voluntary).ti,ab. or *Voluntary Workers/ or *Consumer Participation/ or *Health Status/	199928
10	8 and 9	638
11	1 or 2 or 3 or 4 or 5 or 6 or 7 or 10	3520
12	((Volunteer$ or voluntary) adj5 (environment$ or nature or rural or countryside or outdoor$ or outside or backcountry or hinterland or outback or wood$ or park$1 or parkland or garden$ or meadow$ or horticultural or floricultural or botanical or arboretum or allotment$ or forest$ or rainforest or moor$ or dale$1 or marsh$ or mountain$ or beach$ or wilderness or landscape$ or tree$ or copse$ or river$ or lake$ or canal$ or waterway or wetland$ or (open adj1 space$) or (protected adj1 area$) or green$ or planning$ or footpath$ or trail$ or coast$ or cliff$ or dune$ or (bio adj1 diversity) or (eco adj1 system) or (protected adj1 area$))).ti,ab	1142
13	(((voluntary or volunteer$) adj5 (group$ or association or stakeholder$ or steward$ or ranger$)) and (environment$ or nature or rural or countryside or outdoor$ or outside or backcountry or hinterland or outback or wood$ or park$1 or parkland or garden$ or meadow$ or horticultural or floricultural or botanical or arboretum or allotment$ or forest$ or rainforest or moor$ or dale$1 or marsh$ or mountain$ or beach$ or wilderness or landscape$ or tree$ or copse$ or river$ or lake$ or canal$ or waterway or wetland$ or (open adj1 space$) or (protected adj1 area$) or green$ or planning$ or footpath$ or trail$ or coast$ or cliff$ or dune$ or (bio adj1 diversity) or (eco adj1 system) or (protected adj1 area$))).ti,ab	667
14	*Voluntary Workers/	3989
15	(environment$ or nature or rural or countryside or outdoor$ or outside or backcountry or hinterland or outback or wood$ or park$1 or parkland or garden$ or meadow$ or horticultural or floricultural or botanical or arboretum or allotment$ or forest$ or rainforest or moor$ or dale$1 or marsh$ or mountain$ or beach$ or wilderness or landscape$ or tree$ or copse$ or river$ or lake$ or canal$ or waterway or wetland$ or (open adj1 space$) or (protected adj1 area$) or green$ or planning$ or footpath$ or trail$ or coast$ or cliff$ or dune$ or (bio adj1 diversity) or (eco adj1 system) or (protected adj1 area$)).ti,ab	1253503

(*Continued*)

16	14 and 15	356
17	12 or 13 or 16	2010
18	(Green$ adj3 (space$ or gym or exercise or volunteer$ or voluntary or conservation or infrastructure or care or streets or communal or Guerrilla)).ti,ab	402
19	greenspace.ti,ab.	25
20	18 or 19	425
21	(urban adj3 (green$ or park$1 or parkland or garden$ or horticultur$ or wood$ or forest$ or botanical or arboretum or allotment$ or (open adj1 space))).ti,ab	579
22	((work$ or renewal or volunteer$ or voluntary or practical or regenerat$ or restor$ or maintain$ or care or enhance or preserve or creat$) and (urban or city or metropolis or town$) and (garden$ or park$1 or parkland or allotment$)).ti,ab	370
23	*Cities/ and ((work$ or renewal or volunteer$ or voluntary or practical or regenerat$ or restor$ or maintain$ or care or enhance or preserve or creat$) and (garden$ or park$1 or parkland or allotment$)).ti,ab	5
24	*Urban Health/ and (*Conservation of Natural Resources/ or *Voluntary Workers/)	19
25	21 or 22 or 23 or 24	914
26	((garden$ or horticulture or allotment$ or botanical or arboretum) adj5 (kitchen or school$ or college$ or university or campus or hospital$ or prison$ or penitentiary or institution or urban or green$ or communit$ or communal or group$ or guerrilla or (bio adj1 diver$) or eco or ((grow or pick) adj3 your own))).ti,ab	595
27	((garden$ or horticulture or allotment$ or botanical or arboretum) adj5 (maintain$ or creat$ or culivat$ or enhance$ or preserve or voluntary or volunteer or conservation$ or participat$)).ti,ab	120
28	Gardening/ and (*Conservation of Natural Resources/ or *Voluntary Workers/)	13
29	*Gardening/ and (kitchen or school$ or college$ or university or campus or hospital$ or prison$ or penitentiary or institution or urban or green$ or communit$ or communal or group$ or	118

(*Continued*)

	guerrilla or (bio adj1 diver$) or eco or maintain$ or creat$ or culivat$ or voluntary or volunteer or conservation$ or partici-pat$).ti,ab	
30	26 or 27 or 28 or 29	754
31	((communit$ adj5 (group$ or team$ or association$ or organi-sation or organization or participa$ or stakeholder$ or steward$ or trust$ or ranger$ or activit$)) and (garden$ or allotment$ or forest or (natural and environment) or conservation$)).ti,ab	363
32	(communit$ and (work$ or renewal or volunteer$ or volun-tary or practical or regenerat$ or restor$ or maintain$ or care or enhance$ or preserve or creat$ or activ$ or action$ or in-volve$) and ((natur$ adj3 environment$) or (environmental$ and conservation$))).ti,ab	479
33	(((communit$ or local) adj5 (garden$ or park$ or green$ or greenspace or outdoor$ or outside$ or pavement$ or sidewalk$ or wood$ or allotment$ or lake$ or canal$ or river$)) and (work$ or renewal or volunteer$ or voluntary or practical or participat$ or regenerat$ or restor$ or maintain$ or enhance or preserve or creat$)).ti,ab	813
34	31 or 32 or 33	1556
35	11 or 17 or 20 or 25 or 30 or 34	8554
36	exp animals/ not humans.sh.	3785951
37	35 not 36	6941
38	(clinical or surgery or surgical or cell or cells or laboratory or placebo or bladder or uterus or breast or gene or genes or genetic or bowel or liver or enzymes or viral or lymph or molecular).mp	9317419
39	37 not 38	4815
40	limit 39 to english language	4349
41	limit 40 to yr="1990 -Current"	3896

Hits: 3896
Notes: N/A
File Saved: Medline Endnote RIS 3896.txt

Strategy Annex

1.

Database(s): Ovid MEDLINE(R)
Host: OVID
Data Parameters: 1946 to September Week 3 2012
Date Searched: Wednesday 3rd October 2012
Searched By: CC
Strategy Checked by: KH, RL and RG
Search Strategy:

#	Searches	Results
1	(conservation$ and natural and environment$ and (renewal or volunteer$ or voluntary or participat$ or practical or regenerat$ or restor$ or maintain$ or care or enhance$ or preserve or creat$ or activ$ or action$ or involve$)).ti,ab	377
2	(Conservation adj3 interventions).ti,ab.	29
3	((environmental$ adj3 (conservation$ or volunteer$ or steward$)) and (Regenerat$ or restore or restoration or redevelop or maintain or enhance or preserve or preserving or create or creation or establish or establishing or founding or build$ or cultivat$ or cultivation or participate or participation)).ti,ab	73
4	(conservation$ adj3 (group$ or volunteer$ or voluntary or association$ or organisation$ or organization$ or participa$ or stakeholder$ or steward$ or trust or ranger$ or activit$)).ti,ab	747
5	(conservation$ adj5 (nature or rural or countryside or outdoor$ or outside or backcountry or hinterland or outback or wood$ or park$1 or parkland or garden$ or meadow$ or farm$ or (farm adj1 land) or horticultural or floricultural or botanical or arboretum or allotment$ or forest$ or rainforest or moor$ or dale$1 or marsh$ or mountain$ or beach$ or wilderness or landscape$ or tree$ or copse$ or river$ or lake$ or canal$ or waterway or wetland$ or (open adj1 space$) or (protected adj1 area$) or green$ or planning$ or footpath$ or trail$ or coast$ or cliff$ or dune$ or (bio adj1 diversity) or (eco adj1 system) or (protected adj1 area$))).ti,ab	1688
6	(geoconservation or (geo adj3 conservation)).ti,ab.	0
7	((activ$ or practical or participat$) adj3 conservation$).ti,ab	481
8	exp "Conservation of Natural Resources"/ or *Environment/ or *Environment Design/	42248
9	(volunteer$ or voluntary).ti,ab. or *Voluntary Workers/ or *Consumer Participation/ or *Health Status/	199928
10	8 and 9	638

(*Continued*)

11	1 or 2 or 3 or 4 or 5 or 6 or 7 or 10	3520
12	((Volunteer$ or voluntary) adj5 (environment$ or nature or rural or countryside or outdoor$ or outside or backcountry or hinterland or outback or wood$ or park$1 or parkland or garden$ or meadow$ or horticultural or floricultural or botanical or arboretum or allotment$ or forest$ or rainforest or moor$ or dale$1 or marsh$ or mountain$ or beach$ or wilderness or landscape$ or tree$ or copse$ or river$ or lake$ or canal$ or waterway or wetland$ or (open adj1 space$) or (protected adj1 area$) or green$ or planning$ or footpath$ or trail$ or coast$ or cliff$ or dune$ or (bio adj1 diversity) or (eco adj1 system) or (protected adj1 area$))).ti,ab	1142
13	(((voluntary or volunteer$) adj5 (group$ or association or stakeholder$ or steward$ or ranger$)) and (environment$ or nature or rural or countryside or outdoor$ or outside or backcountry or hinterland or outback or wood$ or park$1 or parkland or garden$ or meadow$ or horticultural or floricultural or botanical or arboretum or allotment$ or forest$ or rainforest or moor$ or dale$1 or marsh$ or mountain$ or beach$ or wilderness or landscape$ or tree$ or copse$ or river$ or lake$ or canal$ or waterway or wetland$ or (open adj1 space$) or (protected adj1 area$) or green$ or planning$ or footpath$ or trail$ or coast$ or cliff$ or dune$ or (bio adj1 diversity) or (eco adj1 system) or (protected adj1 area$))).ti,ab	667
14	*Voluntary Workers/	3989
15	(environment$ or nature or rural or countryside or outdoor$ or outside or backcountry or hinterland or outback or wood$ or park$1 or parkland or garden$ or meadow$ or horticultural or floricultural or botanical or arboretum or allotment$ or forest$ or rainforest or moor$ or dale$1 or marsh$ or mountain$ or beach$ or wilderness or landscape$ or tree$ or copse$ or river$ or lake$ or canal$ or waterway or wetland$ or (open adj1 space$) or (protected adj1 area$) or green$ or planning$ or footpath$ or trail$ or coast$ or cliff$ or dune$ or (bio adj1 diversity) or (eco adj1 system) or (protected adj1 area$)).ti,ab	1253503
16	14 and 15	356
17	12 or 13 or 16	2010
18	(Green$ adj3 (space$ or gym or exercise or volunteer$ or voluntary or conservation or infrastructure or care or streets or communal or Guerrilla)).ti,ab	402

(*Continued*)

19	greenspace.ti,ab.	25
20	18 or 19	425
21	(urban adj3 (green$ or park$1 or parkland or garden$ or horticultur$ or wood$ or forest$ or botanical or arboretum or allotment$ or (open adj1 space))).ti,ab	579
22	((work$ or renewal or volunteer$ or voluntary or practical or regenerat$ or restor$ or maintain$ or care or enhance or preserve or creat$) and (urban or city or metropolis or town$) and (garden$ or park$1 or parkland or allotment$)).ti,ab	370
23	*Cities/ and ((work$ or renewal or volunteer$ or voluntary or practical or regenerat$ or restor$ or maintain$ or care or enhance or preserve or creat$) and (garden$ or park$1 or parkland or allotment$)).ti,ab	5
24	*Urban Health/ and (*Conservation of Natural Resources/ or *Voluntary Workers/)	19
25	21 or 22 or 23 or 24	914
26	((garden$ or horticulture or allotment$ or botanical or arboretum) adj5 (kitchen or school$ or college$ or university or campus or hospital$ or prison$ or penitentiary or institution or urban or green$ or communit$ or communal or group$ or guerrilla or (bio adj1 diver$) or eco or ((grow or pick) adj3 your own))).ti,ab	595
27	((garden$ or horticulture or allotment$ or botanical or arboretum) adj5 (maintain$ or creat$ or culivat$ or enhance$ or preserve or voluntary or volunteer or conservation$ or participat$)).ti,ab	120
28	Gardening/ and (*Conservation of Natural Resources/ or *Voluntary Workers/)	13
29	*Gardening/ and (kitchen or school$ or college$ or university or campus or hospital$ or prison$ or penitentiary or institution or urban or green$ or communit$ or communal or group$ or guerrilla or (bio adj1 diver$) or eco or maintain$ or creat$ or culivat$ or voluntary or volunteer or conservation$ or participat$).ti,ab	118
30	26 or 27 or 28 or 29	754

(*Continued*)

31	((communit$ adj5 (group$ or team$ or association$ or organisation or organization or participa$ or stakeholder$ or steward$ or trust$ or ranger$ or activit$)) and (garden$ or allotment$ or forest or (natural and environment) or conservation$)).ti,ab	363
32	(communit$ and (work$ or renewal or volunteer$ or voluntary or practical or regenerat$ or restor$ or maintain$ or care or enhance$ or preserve or creat$ or activ$ or action$ or involve$) and ((natur$ adj3 environment$) or (environmental$ and conservation$))).ti,ab	479
33	(((communit$ or local) adj5 (garden$ or park$ or green$ or greenspace or outdoor$ or outside$ or pavement$ or sidewalk$ or wood$ or allotment$ or lake$ or canal$ or river$)) and (work$ or renewal or volunteer$ or voluntary or practical or participat$ or regenerat$ or restor$ or maintain$ or enhance or preserve or creat$)).ti,ab	813
34	31 or 32 or 33	1556
35	11 or 17 or 20 or 25 or 30 or 34	8554
36	exp animals/ not humans.sh.	3785951
37	35 not 36	6941
38	(clinical or surgery or surgical or cell or cells or laboratory or placebo or bladder or uterus or breast or gene or genes or genetic or bowel or liver or enzymes or viral or lymph or molecular).mp	9317419
39	37 not 38	4815
40	limit 39 to english language	4349
41	limit 40 to yr="1990 -Current"	3896

Hits: 3896
Notes: N/A
File Saved: MEDLINE Endnote RIS 3896.txt
2.
Database(s): MEDLINE(R) In-Process & Other Non-Indexed Citations October 02, 2012
Host: OVID
Data Parameters: October 02, 2012
Date Searched: Wednesday 3rd October 2012
Searched By: CC
Strategy Checked by: KH, RL and RG
Search Strategy:

#	Searches	Results
1	(conservation$ and natural and environment$ and (renewal or volunteer$ or voluntary or participat$ or practical or regenerat$ or restor$ or maintain$ or care or enhance$ or preserve or creat$ or activ$ or action$ or involve$)).ti,ab	32
2	(Conservation adj3 interventions).ti,ab.	5
3	((environmental$ adj3 (conservation$ or volunteer$ or steward$)) and (Regenerat$ or restore or restoration or redevelop or maintain or enhance or preserve or preserving or create or creation or establish or establishing or founding or build$ or cultivat$ or cultivation or participate or participation)).ti,ab	9
4	(conservation$ adj3 (group$ or volunteer$ or voluntary or association$ or organisation$ or organization$ or participa$ or stakeholder$ or steward$ or trust or ranger$ or activit$)).ti,ab	51
5	(conservation$ adj5 (nature or rural or countryside or outdoor$ or outside or backcountry or hinterland or outback or wood$ or park$1 or parkland or garden$ or meadow$ or farm$ or (farm adj1 land) or horticultural or floricultural or botanical or arboretum or allotment$ or forest$ or rainforest or moor$ or dale$1 or marsh$ or mountain$ or beach$ or wilderness or landscape$ or tree$ or copse$ or river$ or lake$ or canal$ or waterway or wetland$ or (open adj1 space$) or (protected adj1 area$) or green$ or planning$ or footpath$ or trail$ or coast$ or cliff$ or dune$ or (bio adj1 diversity) or (eco adj1 system) or (protected adj1 area$))).ti,ab	200
6	(geoconservation or (geo adj3 conservation)).ti,ab.	0
7	((activ$ or practical or participat$) adj3 conservation$).ti,ab	28
8	exp "Conservation of Natural Resources"/ or *Environment/ or *Environment Design/	0
9	(volunteer$ or voluntary).ti,ab. or *Voluntary Workers/ or *Consumer Participation/ or *Health Status/	6252
10	8 and 9	0
11	1 or 2 or 3 or 4 or 5 or 6 or 7 or 10	288
12	((Volunteer$ or voluntary) adj5 (environment$ or nature or rural or countryside or outdoor$ or outside or backcountry or hinterland or outback or wood$ or park$1 or parkland or garden$ or meadow$ or horticultural or floricultural or botanical	47

(*Continued*)

	or arboretum or allotment$ or forest$ or rainforest or moor$ or dale$1 or marsh$ or mountain$ or beach$ or wilderness or landscape$ or tree$ or copse$ or river$ or lake$ or canal$ or waterway or wetland$ or (open adj1 space$) or (protected adj1 area$) or green$ or planning$ or footpath$ or trail$ or coast$ or cliff$ or dune$ or (bio adj1 diversity) or (eco adj1 system) or (protected adj1 area$))).ti,ab	
13	(((voluntary or volunteer$) adj5 (group$ or association or stakeholder$ or steward$ or ranger$)) and (environment$ or nature or rural or countryside or outdoor$ or outside or backcountry or hinterland or outback or wood$ or park$1 or parkland or garden$ or meadow$ or horticultural or floricultural or botanical or arboretum or allotment$ or forest$ or rainforest or moor$ or dale$1 or marsh$ or mountain$ or beach$ or wilderness or landscape$ or tree$ or copse$ or river$ or lake$ or canal$ or waterway or wetland$ or (open adj1 space$) or (protected adj1 area$) or green$ or planning$ or footpath$ or trail$ or coast$ or cliff$ or dune$ or (bio adj1 diversity) or (eco adj1 system) or (protected adj1 area$))).ti,ab	38
14	*Voluntary Workers/	0
15	(environment$ or nature or rural or countryside or outdoor$ or outside or backcountry or hinterland or outback or wood$ or park$1 or parkland or garden$ or meadow$ or horticultural or floricultural or botanical or arboretum or allotment$ or forest$ or rainforest or moor$ or dale$1 or marsh$ or mountain$ or beach$ or wilderness or landscape$ or tree$ or copse$ or river$ or lake$ or canal$ or waterway or wetland$ or (open adj1 space$) or (protected adj1 area$) or green$ or planning$ or footpath$ or trail$ or coast$ or cliff$ or dune$ or (bio adj1 diversity) or (eco adj1 system) or (protected adj1 area$)).ti,ab	114183
16	14 and 15	0
17	12 or 13 or 16	81
18	(Green$ adj3 (space$ or gym or exercise or volunteer$ or voluntary or conservation or infrastructure or care or streets or communal or Guerrilla)).ti,ab	91
19	greenspace.ti,ab.	5
20	18 or 19	96
21	(urban adj3 (green$ or park$1 or parkland or garden$ or horticultur$ or wood$ or forest$ or botanical or arboretum or allotment$ or (open adj1 space))).ti,ab	50

(*Continued*)

22	((work$ or renewal or volunteer$ or voluntary or practical or regenerat$ or restor$ or maintain$ or care or enhance or preserve or creat$) and (urban or city or metropolis or town$) and (garden$ or park$1 or parkland or allotment$)).ti,ab	23
23	*Cities/ and ((work$ or renewal or volunteer$ or voluntary or practical or regenerat$ or restor$ or maintain$ or care or enhance or preserve or creat$) and (garden$ or park$1 or parkland or allotment$)).ti,ab	0
24	*Urban Health/ and (*Conservation of Natural Resources/ or *Voluntary Workers/)	0
25	21 or 22 or 23 or 24	68
26	((garden$ or horticulture or allotment$ or botanical or arboretum) adj5 (kitchen or school$ or college$ or university or campus or hospital$ or prison$ or penitentiary or institution or urban or green$ or communit$ or communal or group$ or guerrilla or (bio adj1 diver$) or eco or ((grow or pick) adj3 your own))).ti,ab	61
27	((garden$ or horticulture or allotment$ or botanical or arboretum) adj5 (maintain$ or creat$ or culivat$ or enhance$ or preserve or voluntary or volunteer or conservation$ or participat$)).ti,ab	15
28	Gardening/ and (*Conservation of Natural Resources/ or *Voluntary Workers/)	0
29	*Gardening/ and (kitchen or school$ or college$ or university or campus or hospital$ or prison$ or penitentiary or institution or urban or green$ or communit$ or communal or group$ or guerrilla or (bio adj1 diver$) or eco or maintain$ or creat$ or culivat$ or voluntary or volunteer or conservation$ or participat$).ti,ab	0
30	26 or 27 or 28 or 29	73
31	((communit$ adj5 (group$ or team$ or association$ or organisation or organization or participa$ or stakeholder$ or steward$ or trust$ or ranger$ or activit$)) and (garden$ or allotment$ or forest or (natural and environment) or conservation$)).ti,ab	31
32	(communit$ and (work$ or renewal or volunteer$ or voluntary or practical or regenerat$ or restor$ or maintain$ or care or enhance$ or preserve or creat$ or activ$ or action$ or involve$) and ((natur$ adj3 environment$) or (environmental$ and conservation$))).ti,ab	52

(*Continued*)

33	(((communit$ or local) adj5 (garden$ or park$ or green$ or greenspace or outdoor$ or outside$ or pavement$ or sidewalk$ or wood$ or allotment$ or lake$ or canal$ or river$)) and (work$ or renewal or volunteer$ or voluntary or practical or participat$ or regenerat$ or restor$ or maintain$ or enhance or preserve or creat$)).ti,ab	69
34	31 or 32 or 33	146
35	11 or 17 or 20 or 25 or 30 or 34	703
36	exp animals/ not humans.sh.	3
37	35 not 36	703
38	(clinical or surgery or surgical or cell or cells or laboratory or placebo or bladder or uterus or breast or gene or genes or genetic or bowel or liver or enzymes or viral or lymph or molecular).mp	396413
39	37 not 38	526
40	limit 39 to english language	503
41	limit 40 to yr="1990 -Current"	437

Hits: 437
Notes: N/A
File Saved: MEDLINE in Process RIS 437.txt
3.
Database(s): PsycINFO
Host: OVID
Data Parameters: 1806 to September Week 4 2012
Date Searched: Wednesday 3rd October 2012
Searched By: CC
Strategy Checked by: KH, RL and RG
Search Strategy:
Search Strategy:

#	Searches	Results
1	(conservation$ and natural and environment$ and (renewal or volunteer$ or voluntary or participat$ or practical or regenerat$ or restor$ or maintain$ or care or enhance$ or preserve or creat$ or activ$ or action$ or involve$)).ti,ab	93

(*Continued*)

2	(Conservation adj3 interventions).ti,ab.	8
3	((environmental$ adj3 (conservation$ or volunteer$ or steward$)) and (Regenerat$ or restore or restoration or redevelop or maintain or enhance or preserve or preserving or create or creation or establish or establishing or founding or build$ or cultivat$ or cultivation or participate or participation)).ti,ab	48
4	(conservation$ adj3 (group$ or volunteer$ or voluntary or association$ or organisation$ or organization$ or participa$ or stakeholder$ or steward$ or trust or ranger$ or activit$)).ti,ab	183
5	(conservation$ adj5 (nature or rural or countryside or outdoor$ or outside or backcountry or hinterland or outback or wood$ or park$1 or parkland or garden$ or meadow$ or farm$ or (farm adj1 land) or horticultural or botanical or arboretum or allotment$ or forest$ or rainforest or moor$ or dale$1 or marsh$ or mountain$ or beach$ or wilderness or landscape$ or tree$ or copse$ or river$ or lake$ or canal$ or waterway or wetland$ or (open adj1 space$) or (protected adj1 area$) or green$ or planning$ or footpath$ or trail$ or coast$ or cliff$ or dune$ or (bio adj1 diversity) or (eco adj1 system) or (protected adj1 area$))).ti,ab	205
6	(geoconservation or (geo adj3 conservation)).ti,ab.	0
7	((activ$ or practical or participat$) adj3 conservation$).ti,ab	74
8	exp "Conservation of Natural Resources"/ or *Environment/ or *Environment Design/	8981
9	(volunteer$ or voluntary).ti,ab. or *Voluntary Workers/ or *Consumer Participation/ or *Health Status/	44320
10	8 and 9	78
11	1 or 2 or 3 or 4 or 5 or 6 or 7 or 10	566
12	((Volunteer$ or voluntary) adj5 (environment$ or nature or rural or countryside or outdoor$ or outside or backcountry or hinterland or outback or wood$ or park$1 or parkland or garden$ or meadow$ or horticultural or botanical or arboretum or allotment$ or forest$ or rainforest or moor$ or dale$1 or marsh$ or mountain$ or beach$ or wilderness or landscape$ or tree$ or copse$ or river$ or lake$ or canal$ or waterway or wetland$ or (open adj1 space$) or (protected adj1 area$) or green$ or planning$ or footpath$ or trail$ or coast$ or cliff$ or dune$ or (bio adj1 diversity) or (eco adj1 system) or (protected	646

(*Continued*)

	adj1 area$))).ti,ab	
13	(((voluntary or volunteer$) adj5 (group$ or association or stakeholder$ or steward$ or ranger$)) and (environment$ or nature or rural or countryside or outdoor$ or outside or backcountry or hinterland or outback or wood$ or park$1 or parkland or garden$ or meadow$ or horticultural or botanical or arboretum or allotment$ or forest$ or rainforest or moor$ or dale$1 or marsh$ or mountain$ or beach$ or wilderness or landscape$ or tree$ or copse$ or river$ or lake$ or canal$ or waterway or wetland$ or (open adj1 space$) or (protected adj1 area$) or green$ or planning$ or footpath$ or trail$ or coast$ or cliff$ or dune$ or (bio adj1 diversity) or (eco adj1 system) or (protected adj1 area$))).ti,ab	339
14	*Voluntary Workers/	0
15	(environment$ or nature or rural or countryside or outdoor$ or outside or backcountry or hinterland or outback or wood$ or park$1 or parkland or garden$ or meadow$ or horticultural or botanical or arboretum or allotment$ or forest$ or rainforest or moor$ or dale$1 or marsh$ or mountain$ or beach$ or wilderness or landscape$ or tree$ or copse$ or river$ or lake$ or canal$ or waterway or wetland$ or (open adj1 space$) or (protected adj1 area$) or green$ or planning$ or footpath$ or trail$ or coast$ or cliff$ or dune$ or (bio adj1 diversity) or (eco adj1 system) or (protected adj1 area$)).ti,ab	445308
16	14 and 15	0
17	12 or 13 or 16	951
18	(Green$ adj3 (space$ or gym or exercise or volunteer$ or voluntary or conservation or infrastructure or care or streets or communal or Guerrilla)).ti,ab	126
19	greenspace.ti,ab.	8
20	18 or 19	133
21	(urban adj3 (green$ or park$1 or parkland or garden$ or horticultur$ or wood$ or forest$ or botanical or arboretum or allotment$ or (open adj1 space))).ti,ab	155
22	((work$ or renewal or volunteer$ or voluntary or practical or regenerat$ or restor$ or maintain$ or care or enhance or preserve or creat$) and (urban or city or metropolis or town$) and (garden$ or park$1 or parkland or allotment$)).ti,ab	234

(*Continued*)

23	*Cities/ and ((work$ or renewal or volunteer$ or voluntary or practical or regenerat$ or restor$ or maintain$ or care or enhance or preserve or creat$) and (garden$ or park$1 or parkland or allotment$)).ti,ab	59
24	*Urban Health/ and (*Conservation of Natural Resources/ or *Voluntary Workers/)	0
25	21 or 22 or 23 or 24	367
26	((garden$ or horticulture or allotment$ or botanical or arboretum) adj5 (kitchen or school$ or college$ or university or campus or hospital$ or prison$ or penitentiary or institution or urban or green$ or communit$ or communal or group$ or guerrilla or (bio adj1 diver$) or eco or ((grow or pick) adj3 your own))).ti,ab	243
27	((garden$ or horticulture or allotment$ or botanical or arboretum) adj5 (maintain$ or creat$ or culivat$ or enhance$ or preserve or voluntary or volunteer or conservation$ or participat$)).ti,ab	87
28	Gardening/ and (*Conservation of Natural Resources/ or *Voluntary Workers/)	0
29	*Gardening/ and (kitchen or school$ or college$ or university or campus or hospital$ or prison$ or penitentiary or institution or urban or green$ or communit$ or communal or group$ or guerrilla or (bio adj1 diver$) or eco or maintain$ or creat$ or culivat$ or voluntary or volunteer or conservation$ or participat$).ti,ab	20
30	26 or 27 or 28 or 29	305
31	((communit$ adj5 (group$ or team$ or association$ or organisation or organization or participa$ or stakeholder$ or steward$ or trust$ or ranger$ or activit$)) and (garden$ or allotment$ or forest or (natural and environment) or conservation$)).ti,ab	174
32	(communit$ and (work$ or renewal or volunteer$ or voluntary or practical or regenerat$ or restor$ or maintain$ or care or enhance$ or preserve or creat$ or activ$ or action$ or involve$) and ((natur$ adj3 environment$) or (environmental$ and conservation$))).ti,ab	301
33	(((communit$ or local) adj5 (garden$ or park$ or green$ or greenspace or outdoor$ or outside$ or pavement$ or sidewalk$ or wood$ or allotment$ or lake$ or canal$ or river$)) and (work$ or renewal or volunteer$ or voluntary or practical or	703

(*Continued*)

	participat$ or regenerat$ or restor$ or maintain$ or enhance or preserve or creat$)).ti,ab	
34	31 or 32 or 33	1115
35	11 or 17 or 20 or 25 or 30 or 34	3124
36	(clinical or surgery or surgical or cell or cells or laboratory or placebo or bladder or uterus or breast or gene or genes or genetic or bowel or liver or enzymes or viral or lymph or molecular).mp	545772
37	35 not 36	2841
38	exp animals/	249588
39	37 not 38	2697
40	limit 39 to english language	2604
41	limit 40 to yr="1990 -Current"	2171

Hits: 2171
Notes: N/A
File Saved: PsycINFO RIS 2171.txt
4.
Database(s): HMIC Health Management Information Consortium
Host: OVID
Data Parameters: 1979 to July 2012
Date Searched: Wednesday 3rd October 2012
Searched By: CC
Strategy Checked by: KH, RL and RG
Search Strategy:

#	Searches	Results
1	(conservation$ and natural and environment$ and (renewal or volunteer$ or voluntary or participat$ or practical or regenerat$ or restor$ or maintain$ or care or enhance$ or preserve or creat$ or activ$ or action$ or involve$)).ti,ab	1
2	(Conservation adj3 interventions).ti,ab.	0
3	((environmental$ adj3 (conservation$ or volunteer$ or steward$)) and (Regenerat$ or restore or restoration or redevelop or maintain or enhance or preserve or preserving or create or creation or establish or establishing or founding or build$ or	3

(*Continued*)

	cultivat$ or cultivation or participate or participation)).ti,ab	
4	(conservation$ adj3 (group$ or volunteer$ or voluntary or association$ or organisation$ or organization$ or participa$ or stakeholder$ or steward$ or trust or ranger$ or activit$)).ti,ab	9
5	(conservation$ adj5 (nature or rural or countryside or outdoor$ or outside or backcountry or hinterland or outback or wood$ or park$1 or parkland or garden$ or meadow$ or farm$ or (farm adj1 land) or horticultural or botanical or arboretum or allotment$ or forest$ or rainforest or moor$ or dale$1 or marsh$ or mountain$ or beach$ or wilderness or landscape$ or tree$ or copse$ or river$ or lake$ or canal$ or waterway or wetland$ or (open adj1 space$) or (protected adj1 area$) or green$ or planning$ or footpath$ or trail$ or coast$ or cliff$ or dune$ or (bio adj1 diversity) or (eco adj1 system) or (protected adj1 area$))).ti,ab	11
6	(geoconservation or (geo adj3 conservation)).ti,ab.	0
7	((activ$ or practical or participat$) adj3 conservation$).ti,ab	2
8	exp "Conservation of Natural Resources"/ or *Environment/ or *Environment Design/	0
9	(volunteer$ or voluntary).ti,ab. or *Voluntary Workers/ or *Consumer Participation/ or *Health Status/	6597
10	8 and 9	0
11	1 or 2 or 3 or 4 or 5 or 6 or 7 or 10	20
12	((Volunteer$ or voluntary) adj5 (environment$ or nature or rural or countryside or outdoor$ or outside or backcountry or hinterland or outback or wood$ or park$1 or parkland or garden$ or meadow$ or horticultural or botanical or arboretum or allotment$ or forest$ or rainforest or moor$ or dale$1 or marsh$ or mountain$ or beach$ or wilderness or landscape$ or tree$ or copse$ or river$ or lake$ or canal$ or waterway or wetland$ or (open adj1 space$) or (protected adj1 area$) or green$ or planning$ or footpath$ or trail$ or coast$ or cliff$ or dune$ or (bio adj1 diversity) or (eco adj1 system) or (protected adj1 area$))).ti,ab	120
13	(((voluntary or volunteer$) adj5 (group$ or association or stakeholder$ or steward$ or ranger$)) and (environment$ or nature or rural or countryside or outdoor$ or outside or backcountry or hinterland or outback or wood$ or park$1 or parkland or garden$ or meadow$ or horticultural or botanical or	87

(*Continued*)

	arboretum or allotment$ or forest$ or rainforest or moor$ or dale$1 or marsh$ or mountain$ or beach$ or wilderness or landscape$ or tree$ or copse$ or river$ or lake$ or canal$ or waterway or wetland$ or (open adj1 space$) or (protected adj1 area$) or green$ or planning$ or footpath$ or trail$ or coast$ or cliff$ or dune$ or (bio adj1 diversity) or (eco adj1 system) or (protected adj1 area$))).ti,ab	
14	*Voluntary Workers/	0
15	(environment$ or nature or rural or countryside or outdoor$ or outside or backcountry or hinterland or outback or wood$ or park$1 or parkland or garden$ or meadow$ or horticultural or botanical or arboretum or allotment$ or forest$ or rainforest or moor$ or dale$1 or marsh$ or mountain$ or beach$ or wilderness or landscape$ or tree$ or copse$ or river$ or lake$ or canal$ or waterway or wetland$ or (open adj1 space$) or (protected adj1 area$) or green$ or planning$ or footpath$ or trail$ or coast$ or cliff$ or dune$ or (bio adj1 diversity) or (eco adj1 system) or (protected adj1 area$)).ti,ab	35742
16	14 and 15	0
17	12 or 13 or 16	196
18	(Green$ adj3 (space$ or gym or exercise or volunteer$ or voluntary or conservation or infrastructure or care or streets or communal or Guerrilla)).ti,ab	96
19	greenspace.ti,ab.	4
20	18 or 19	100
21	(urban adj3 (green$ or park$1 or parkland or garden$ or horticultur$ or wood$ or forest$ or botanical or arboretum or allotment$ or (open adj1 space))).ti,ab	22
22	((work$ or renewal or volunteer$ or voluntary or practical or regenerat$ or restor$ or maintain$ or care or enhance or preserve or creat$) and (urban or city or metropolis or town$) and (garden$ or park$1 or parkland or allotment$)).ti,ab	26
23	*Cities/ and ((work$ or renewal or volunteer$ or voluntary or practical or regenerat$ or restor$ or maintain$ or care or enhance or preserve or creat$) and (garden$ or park$1 or parkland or allotment$)).ti,ab	0
24	*Urban Health/ and (*Conservation of Natural Resources/ or *Voluntary Workers/)	0

(*Continued*)

25	21 or 22 or 23 or 24	46
26	((garden$ or horticulture or allotment$ or botanical or arboretum) adj5 (kitchen or school$ or college$ or university or campus or hospital$ or prison$ or penitentiary or institution or urban or green$ or communit$ or communal or group$ or guerrilla or (bio adj1 diver$) or eco or ((grow or pick) adj3 your own))).ti,ab	40
27	((garden$ or horticulture or allotment$ or botanical or arboretum) adj5 (maintain$ or creat$ or culivat$ or enhance$ or preserve or voluntary or volunteer or conservation$ or participat$)).ti,ab	15
28	Gardening/ and (*Conservation of Natural Resources/ or *Voluntary Workers/)	0
29	*Gardening/ and (kitchen or school$ or college$ or university or campus or hospital$ or prison$ or penitentiary or institution or urban or green$ or communit$ or communal or group$ or guerrilla or (bio adj1 diver$) or eco or maintain$ or creat$ or culivat$ or voluntary or volunteer or conservation$ or participat$).ti,ab	0
30	26 or 27 or 28 or 29	53
31	((communit$ adj5 (group$ or team$ or association$ or organisation or organization or participa$ or stakeholder$ or steward$ or trust$ or ranger$ or activit$)) and (garden$ or allotment$ or forest or (natural and environment) or conservation$)).ti,ab	18
32	(communit$ and (work$ or renewal or volunteer$ or voluntary or practical or regenerat$ or restor$ or maintain$ or care or enhance$ or preserve or creat$ or activ$ or action$ or involve$) and ((natur$ adj3 environment$) or (environmental$ and conservation$))).ti,ab	13
33	(((communit$ or local) adj5 (garden$ or park$ or green$ or greenspace or outdoor$ or outside$ or pavement$ or sidewalk$ or wood$ or allotment$ or lake$ or canal$ or river$)) and (work$ or renewal or volunteer$ or voluntary or practical or participat$ or regenerat$ or restor$ or maintain$ or enhance or preserve or creat$)).ti,ab	75
34	31 or 32 or 33	102
35	11 or 17 or 20 or 25 or 30 or 34	461

(*Continued*)

36	(clinical or surgery or surgical or cell or cells or laboratory or placebo or bladder or uterus or breast or gene or genes or genetic or bowel or liver or enzymes or viral or lymph or molecular).mp	49128
37	35 not 36	429
38	exp animals/	1679
39	37 not 38	428
40	limit 39 to english language [Limit not valid; records were retained]	428
41	limit 40 to yr="1990 -Current"	318

Hits: 318
Notes: N/A
File Saved: HMIC RIS 318.txt
5.
Database(s): Social Policy and Practice (SPP)
Host: OVID
Data Parameters: 201207
Date Searched: Wednesday 3rd October 2012
Searched By: CC
Strategy Checked by: KH, RL and RG
Search Strategy:

#	Searches	Results
1	(conservation$ and natural and environment$ and (renewal or volunteer$ or voluntary or participat$ or practical or regenerat$ or restor$ or maintain$ or care or enhance$ or preserve or creat$ or activ$ or action$ or involve$)).ti,ab	26
2	(Conservation adj3 interventions).ti,ab.	0
3	((environmental$ adj3 (conservation$ or volunteer$ or steward$)) and (Regenerat$ or restore or restoration or redevelop or maintain or enhance or preserve or preserving or create or creation or establish or establishing or founding or build$ or cultivat$ or cultivation or participate or participation)).ti,ab	15
4	(conservation$ adj3 (group$ or volunteer$ or voluntary or association$ or organisation$ or organization$ or participa$ or stakeholder$ or steward$ or trust or ranger$ or activit$)).ti,ab	36

(*Continued*)

5	(conservation$ adj5 (nature or rural or countryside or outdoor$ or outside or backcountry or hinterland or outback or wood$ or park$1 or parkland or garden$ or meadow$ or farm$ or (farm adj1 land) or horticultural or botanical or arboretum or allotment$ or forest$ or rainforest or moor$ or dale$1 or marsh$ or mountain$ or beach$ or wilderness or landscape$ or tree$ or copse$ or river$ or lake$ or canal$ or waterway or wetland$ or (open adj1 space$) or (protected adj1 area$) or green$ or planning$ or footpath$ or trail$ or coast$ or cliff$ or dune$ or (bio adj1 diversity) or (eco adj1 system) or (protected adj1 area$))).ti,ab	252
6	(geoconservation or (geo adj3 conservation)).ti,ab.	0
7	((activ$ or practical or participat$) adj3 conservation$).ti,ab	12
8	[exp "Conservation of Natural Resources"/ or *Environment/ or *Environment Design/]	0
9	(volunteer$ or voluntary).ti,ab. or *Voluntary Workers/ or *Consumer Participation/ or *Health Status/	12635
10	8 and 9	0
11	1 or 2 or 3 or 4 or 5 or 6 or 7 or 10	303
12	((Volunteer$ or voluntary) adj5 (environment$ or nature or rural or countryside or outdoor$ or outside or backcountry or hinterland or outback or wood$ or park$1 or parkland or garden$ or meadow$ or horticultural or botanical or arboretum or allotment$ or forest$ or rainforest or moor$ or dale$1 or marsh$ or mountain$ or beach$ or wilderness or landscape$ or tree$ or copse$ or river$ or lake$ or canal$ or waterway or wetland$ or (open adj1 space$) or (protected adj1 area$) or green$ or planning$ or footpath$ or trail$ or coast$ or cliff$ or dune$ or (bio adj1 diversity) or (eco adj1 system) or (protected adj1 area$))).ti,ab	306
13	(((voluntary or volunteer$) adj5 (group$ or association or stakeholder$ or steward$ or ranger$)) and (environment$ or nature or rural or countryside or outdoor$ or outside or backcountry or hinterland or outback or wood$ or park$1 or parkland or garden$ or meadow$ or horticultural or botanical or arboretum or allotment$ or forest$ or rainforest or moor$ or dale$1 or marsh$ or mountain$ or beach$ or wilderness or landscape$ or tree$ or copse$ or river$ or lake$ or canal$ or waterway or wetland$ or (open adj1 space$) or (protected adj1 area$) or green$ or planning$ or footpath$ or trail$ or coast$	156

(*Continued*)

	or cliff$ or dune$ or (bio adj1 diversity) or (eco adj1 system) or (protected adj1 area$))).ti,ab	
14	[*Voluntary Workers/]	0
15	(environment$ or nature or rural or countryside or outdoor$ or outside or backcountry or hinterland or outback or wood$ or park$1 or parkland or garden$ or meadow$ or horticultural or botanical or arboretum or allotment$ or forest$ or rainforest or moor$ or dale$1 or marsh$ or mountain$ or beach$ or wilderness or landscape$ or tree$ or copse$ or river$ or lake$ or canal$ or waterway or wetland$ or (open adj1 space$) or (protected adj1 area$) or green$ or planning$ or footpath$ or trail$ or coast$ or cliff$ or dune$ or (bio adj1 diversity) or (eco adj1 system) or (protected adj1 area$)).ti,ab	56774
16	14 and 15	0
17	12 or 13 or 16	436
18	(Green$ adj3 (space$ or gym or exercise or volunteer$ or voluntary or conservation or infrastructure or care or streets or communal or Guerrilla)).ti,ab	525
19	greenspace.ti,ab.	71
20	18 or 19	567
21	(urban adj3 (green$ or park$1 or parkland or garden$ or horticultur$ or wood$ or forest$ or botanical or arboretum or allotment$ or (open adj1 space))).ti,ab	249
22	((work$ or renewal or volunteer$ or voluntary or practical or regenerat$ or restor$ or maintain$ or care or enhance or preserve or creat$) and (urban or city or metropolis or town$) and (garden$ or park$1 or parkland or allotment$)).ti,ab	353
23	[*Cities/ and ((work$ or renewal or volunteer$ or voluntary or practical or regenerat$ or restor$ or maintain$ or care or enhance or preserve or creat$) and (garden$ or park$1 or parkland or allotment$)).ti,ab.]	0
24	[*Urban Health/ and (*Conservation of Natural Resources/ or *Voluntary Workers/)]	0
25	21 or 22 or 23 or 24	527

(*Continued*)

26	((garden$ or horticulture or allotment$ or botanical or arboretum) adj5 (kitchen or school$ or college$ or university or campus or hospital$ or prison$ or penitentiary or institution or urban or green$ or communit$ or communal or group$ or guerrilla or (bio adj1 diver$) or eco or ((grow or pick) adj3 your own))).ti,ab	198
27	((garden$ or horticulture or allotment$ or botanical or arboretum) adj5 (maintain$ or creat$ or culivat$ or enhance$ or preserve or voluntary or volunteer or conservation$ or participat$)).ti,ab	65
28	[Gardening/ and (*Conservation of Natural Resources/ or *Voluntary Workers/)]	0
29	[*Gardening/ and (kitchen or school$ or college$ or university or campus or hospital$ or prison$ or penitentiary or institution or urban or green$ or communit$ or communal or group$ or guerrilla or (bio adj1 diver$) or eco or maintain$ or creat$ or culivat$ or voluntary or volunteer or conservation$ or participat$).ti,ab.]	0
30	26 or 27 or 28 or 29	249
31	((communit$ adj5 (group$ or team$ or association$ or organisation or organization or participa$ or stakeholder$ or steward$ or trust$ or ranger$ or activit$)) and (garden$ or allotment$ or forest or (natural and environment) or conservation$)).ti,ab	84
32	(communit$ and (work$ or renewal or volunteer$ or voluntary or practical or regenerat$ or restor$ or maintain$ or care or enhance$ or preserve or creat$ or activ$ or action$ or involve$) and ((natur$ adj3 environment$) or (environmental$ and conservation$))).ti,ab	110
33	((((communit$ or local) adj5 (garden$ or park$ or green$ or greenspace or outdoor$ or outside$ or pavement$ or sidewalk$ or wood$ or allotment$ or lake$ or canal$ or river$)) and (work$ or renewal or volunteer$ or voluntary or practical or participat$ or regenerat$ or restor$ or maintain$ or enhance or preserve or creat$)).ti,ab	358
34	31 or 32 or 33	521
35	11 or 17 or 20 or 25 or 30 or 34	2152
36	(clinical or surgery or surgical or cell or cells or laboratory or placebo or bladder or uterus or breast or gene or genes or genetic or bowel or liver or enzymes or viral or lymph or molecular).	12264

(*Continued*)

	mp	
37	35 not 36	2140
38	[exp animals/]	0
39	37 not 38	2140
40	limit 39 to english language [Limit not valid; records were retained]	2140
41	limit 40 to yr="1990 -Current"	1985

Hits: 1985
Notes: N/A
File Saved: Social Policy and Practice RIS 1985.txt
6.
Database(s): Global Health
Host: OVID
Data Parameters: 1973 to September 2012
Date Searched: Wednesday 3rd October 2012
Searched By: CC
Strategy Checked by: KH, RL and RG
Search Strategy:
Search Strategy:

#	Searches	Results
1	(conservation$ and natural and environment$ and (renewal or volunteer$ or voluntary or participat$ or practical or regenerat$ or restor$ or maintain$ or care or enhance$ or preserve or creat$ or activ$ or action$ or involve$)).ti,ab	99
2	(Conservation adj3 interventions).ti,ab.	6
3	((environmental$ adj3 (conservation$ or volunteer$ or steward$)) and (Regenerat$ or restore or restoration or redevelop or maintain or enhance or preserve or preserving or create or creation or establish or establishing or founding or build$ or cultivat$ or cultivation or participate or participation)).ti,ab	29
4	(conservation$ adj3 (group$ or volunteer$ or voluntary or association$ or organisation$ or organization$ or participa$ or stakeholder$ or steward$ or trust or ranger$ or activit$)).ti,ab	115
5	(conservation$ adj5 (nature or rural or countryside or outdoor$ or outside or backcountry or hinterland or outback or wood$	516

(*Continued*)

	or park$1 or parkland or garden$ or meadow$ or farm$ or (farm adj1 land) or horticultural or botanical or arboretum or allotment$ or forest$ or rainforest or moor$ or dale$1 or marsh$ or mountain$ or beach$ or wilderness or landscape$ or tree$ or copse$ or river$ or lake$ or canal$ or waterway or wetland$ or (open adj1 space$) or (protected adj1 area$) or green$ or planning$ or footpath$ or trail$ or coast$ or cliff$ or dune$ or (bio adj1 diversity) or (eco adj1 system) or (protected adj1 area$))).ti,ab	
6	(geoconservation or (geo adj3 conservation)).ti,ab.	0
7	((activ$ or practical or participat$) adj3 conservation$).ti,ab	64
8	exp "Conservation of Natural Resources"/ or *Environment/ or *Environment Design/	0
9	(volunteer$ or voluntary).ti,ab. or *Voluntary Workers/ or *Consumer Participation/ or *Health Status/	23094
10	8 and 9	0
11	1 or 2 or 3 or 4 or 5 or 6 or 7 or 10	731
12	((Volunteer$ or voluntary) adj5 (environment$ or nature or rural or countryside or outdoor$ or outside or backcountry or hinterland or outback or wood$ or park$1 or parkland or garden$ or meadow$ or horticultural or botanical or arboretum or allotment$ or forest$ or rainforest or moor$ or dale$1 or marsh$ or mountain$ or beach$ or wilderness or landscape$ or tree$ or copse$ or river$ or lake$ or canal$ or waterway or wetland$ or (open adj1 space$) or (protected adj1 area$) or green$ or planning$ or footpath$ or trail$ or coast$ or cliff$ or dune$ or (bio adj1 diversity) or (eco adj1 system) or (protected adj1 area$))).ti,ab	291
13	(((voluntary or volunteer$) adj5 (group$ or association or stakeholder$ or steward$ or ranger$)) and (environment$ or nature or rural or countryside or outdoor$ or outside or backcountry or hinterland or outback or wood$ or park$1 or parkland or garden$ or meadow$ or horticultural or botanical or arboretum or allotment$ or forest$ or rainforest or moor$ or dale$1 or marsh$ or mountain$ or beach$ or wilderness or landscape$ or tree$ or copse$ or river$ or lake$ or canal$ or waterway or wetland$ or (open adj1 space$) or (protected adj1 area$) or green$ or planning$ or footpath$ or trail$ or coast$ or cliff$ or dune$ or (bio adj1 diversity) or (eco adj1 system) or (protected adj1 area$))).ti,ab	159

(*Continued*)

14	*Voluntary Workers/	0
15	(environment$ or nature or rural or countryside or outdoor$ or outside or backcountry or hinterland or outback or wood$ or park$1 or parkland or garden$ or meadow$ or horticultural or botanical or arboretum or allotment$ or forest$ or rainforest or moor$ or dale$1 or marsh$ or mountain$ or beach$ or wilderness or landscape$ or tree$ or copse$ or river$ or lake$ or canal$ or waterway or wetland$ or (open adj1 space$) or (protected adj1 area$) or green$ or planning$ or footpath$ or trail$ or coast$ or cliff$ or dune$ or (bio adj1 diversity) or (eco adj1 system) or (protected adj1 area$)).ti,ab	262336
16	14 and 15	0
17	12 or 13 or 16	432
18	(Green$ adj3 (space$ or gym or exercise or volunteer$ or voluntary or conservation or infrastructure or care or streets or communal or Guerrilla)).ti,ab	214
19	greenspace.ti,ab.	27
20	18 or 19	238
21	(urban adj3 (green$ or park$1 or parkland or garden$ or horticultur$ or wood$ or forest$ or botanical or arboretum or allotment$ or (open adj1 space))).ti,ab	451
22	((work$ or renewal or volunteer$ or voluntary or practical or regenerat$ or restor$ or maintain$ or care or enhance or preserve or creat$) and (urban or city or metropolis or town$) and (garden$ or park$1 or parkland or allotment$)).ti,ab	282
23	*Cities/ and ((work$ or renewal or volunteer$ or voluntary or practical or regenerat$ or restor$ or maintain$ or care or enhance or preserve or creat$) and (garden$ or park$1 or parkland or allotment$)).ti,ab	0
24	*Urban Health/ and (*Conservation of Natural Resources/ or *Voluntary Workers/)	0
25	21 or 22 or 23 or 24	668
26	((garden$ or horticulture or allotment$ or botanical or arboretum) adj5 (kitchen or school$ or college$ or university or campus or hospital$ or prison$ or penitentiary or institution or urban or green$ or communit$ or communal or group$ or guer-	678

(*Continued*)

	rilla or (bio adj1 diver$) or eco or ((grow or pick) adj3 your own))).ti,ab	
27	((garden$ or horticulture or allotment$ or botanical or arboretum) adj5 (maintain$ or creat$ or culivat$ or enhance$ or preserve or voluntary or volunteer or conservation$ or participat$)).ti,ab	131
28	Gardening/ and (*Conservation of Natural Resources/ or *Voluntary Workers/)	0
29	*Gardening/ and (kitchen or school$ or college$ or university or campus or hospital$ or prison$ or penitentiary or institution or urban or green$ or communit$ or communal or group$ or guerrilla or (bio adj1 diver$) or eco or maintain$ or creat$ or culivat$ or voluntary or volunteer or conservation$ or participat$).ti,ab	0
30	26 or 27 or 28 or 29	763
31	((communit$ adj5 (group$ or team$ or association$ or organisation or organization or participa$ or stakeholder$ or steward$ or trust$ or ranger$ or activit$)) and (garden$ or allotment$ or forest or (natural and environment) or conservation$)).ti,ab	175
32	(communit$ and (work$ or renewal or volunteer$ or voluntary or practical or regenerat$ or restor$ or maintain$ or care or enhance$ or preserve or creat$ or activ$ or action$ or involve$) and ((natur$ adj3 environment$) or (environmental$ and conservation$))).ti,ab	122
33	(((communit$ or local) adj5 (garden$ or park$ or green$ or greenspace or outdoor$ or outside$ or pavement$ or sidewalk$ or wood$ or allotment$ or lake$ or canal$ or river$)) and (work$ or renewal or volunteer$ or voluntary or practical or participat$ or regenerat$ or restor$ or maintain$ or enhance or preserve or creat$)).ti,ab	379
34	31 or 32 or 33	630
35	11 or 17 or 20 or 25 or 30 or 34	3029
36	(clinical or surgery or surgical or cell or cells or laboratory or placebo or bladder or uterus or breast or gene or genes or genetic or bowel or liver or enzymes or viral or lymph or molecular).mp	925124
37	35 not 36	2407

(*Continued*)

38	exp animals/	1543479
39	37 not 38	962
40	limit 39 to english language	822
41	limit 40 to yr="1990 -Current"	752

Hits: 752
Notes: N/A
File Saved: Global Health RIS 752.txt
7.
Database(s): *The Cochrane Library* (all)
Host: http://www.thecochranelibrary.com/view/0/index.html
Data Parameters: CDSR Issue 9 of 12, September 2012; CENTRAL Issue 9 of 12 September 2012; DARE Issue 3 of 4, Jul 2012; Methods Issue 3 of 4, Jul 2012; HTA Issue 3 of 4 Jul 2012; NHS EEDS Issue 3 of 4, July 2012.
Date Searched: Wednesday October 3rd 2012
Searched By: CC
Strategy Checked by: KH, RL and RG
Search Strategy:
#1. (conservation* and natural and environment* and (renewal or volunteer* or voluntary or participate* or practical or regenerate* or restor* or maintain* or care or enhance* or preserve or great* or activ* or action* or involve*))
#2. (Conservation near/3 interventions)
#3. ((environmental* near/3 (conservation* or volunteer* or steward*)) and (Regenerat* or restore or restoration or redevelop or maintain or enhance or preserve or preserving or create or creation or establish or establishing or founding or build* or cultivat* or cultivation or participate or participation))
#4. (conservation* near/3 (group* or volunteer* or voluntary or association* or organisation* or organization* or participa* or stakeholder* or steward* or trust or ranger* or activit*))
#5. (conservation* near/5 (nature or rural or countryside or outdoor* or outside or backcountry or hinterland or outback or wood* or park* or parkland or garden* or meadow* or farm* or (farm near/1 land) or horticultural or botanical or arboretum or allotment* or forest* or rainforest or moor* or dale* or marsh* or mountain* or beach* or wilderness or landscape* or tree* or copse* or river* or lake* or canal* or waterway or wetland* or (open near/1 space*) or (protected near/1 area*) or green* or planning* or footpath* or trail* or coast* or cliff* or dune* or (bio near/1 diversity) or (eco near/1 system) or (protected near/1 area*)))
#6. (geoconservation or (geo near/3 conservation))
#7. ((activ* or practical or participat*) near/3 conservation*)
#8. MeSH descriptor: [Conservation of Natural Resources] this term only
#9. #1 or #2 or #3 or #4 or #5 or #6 or #7 or #8
#10.((Volunteer* or voluntary) near/5 (environment* or nature or rural or countryside or outdoor* or outside or backcountry or hinterland or outback or wood* or park* or parkland or garden* or meadow* or farm* or (farm near/1 land) or horticultural or botanical or arboretum or allotment* or forest* or rainforest or moor* or dale* or marsh* or mountain* or beach* or wilderness or landscape* or tree* or copse* or river* or lake* or canal* or waterway or wetland* or (open near/1 space*) or (protected near/1 area*) or green* or planning* or footpath* or trail* or coast* or cliff* or dune* or (bio near/1 diversity) or (eco near/1 system) or (protected near/1 area*)))
#11.(((voluntary or volunteer*) near/5 (group* or association or stakeholder* or steward* or ranger*)) and (environment* or nature or rural or countryside or outdoor* or outside or backcountry or hinterland or outback or wood* or park* or parkland or garden* or meadow* or farm* or (farm near/1 land) or horticultural or botanical or arboretum or allotment* or forest* or rainforest or moor* or dale* or marsh* or mountain* or beach* or wilderness or landscape* or tree* or copse* or river* or lake* or canal* or waterway or wetland* or (open near/1 space*) or (protected near/1 area*) or green* or planning* or footpath* or trail* or coast* or cliff* or dune* or (bio near/1 diversity) or (eco near/1 system) or (protected near/1 area*)))
#12.MeSH descriptor: [Voluntary Workers] this term only

#13.(environment* or nature or rural or countryside or outdoor* or outside or backcountry or hinterland or outback or wood* or park* or parkland or garden* or meadow* or farm* or (farm near/1 land) or horticultural or botanical or arboretum or allotment* or forest* or rainforest or moor* or dale* or marsh* or mountain* or beach* or wilderness or landscape* or tree* or copse* or river* or lake* or canal* or waterway or wetland* or (open near/1 space*) or (protected near/1 area*) or green* or planning* or footpath* or trail* or coast* or cliff* or dune* or (bio near/1 diversity) or (eco near/1 system) or (protected near/1 area*))
#14.#12 and #13
#15.#10 or #11 or #14
#16.(Green* near/3 (space* or gym or exercise or volunteer* or voluntary or conservation or infrastructure or care or streets or communal or Guerrilla))
#17.(greenspace)
#18.#16 or #17
#19.(urban near/3 (green* or park* or parkland or garden* or horticultur* or wood* or forest* or botanical or arboretum or allotment* or (open near/1 space)))
#20.((work* or renewal or volunteer* or voluntary or practical or regenerat* or restor* or maintain* or care or enhance or preserve or creat*) and (urban or city or metropolis or town*) and (garden* or park* or parkland or allotment*))
#21.MeSH descriptor: [Cities] this term only
#22.((work* or renewal or volunteer* or voluntary or practical or regenerat* or restor* or maintain* or care or enhance or preserve or creat*) and (garden* or park* or parkland or allotment*))
#23.#21 and #22
#24.((garden* or horticulture or allotment* or botanical or arboretum) near/5 (kitchen or school* or college* or university or campus or hospital* or prison* or penitentiary or institution or urban or green* or communit* or communal or group* or guerrilla or (bio near/1 diver*) or eco or ((grow or pick) near/3 your own)))
#25.((garden* or horticulture or allotment* or botanical or arboretum) near/5 (maintain* or creat* or culivat* or enhance* or preserve or voluntary or volunteer or conservation* or participat*))
#26.MeSH descriptor: [Gardening] this term only
#27.#19 or #20 or #23 or #24 or #25 or #26
#28.((communit* near/5 (group* or team* or association* or organisation or organization or participa* or stakeholder* or steward* or trust* or ranger* or activit*)) and (garden* or allotment* or forest or (natural and environment) or conservation*))
#29.(communit* and (work* or renewal or volunteer* or voluntary or practical or regenerat* or restor* or maintain* or care or enhance* or preserve or creat* or activ* or action* or involve*) and ((natur* near/3 environment*) or (environmental* and conservation*)))
#30.(((communit* or local) near/5 (garden* or park* or green* or greenspace or outdoor* or outside* or pavement* or sidewalk* or wood* or allotment* or lake* or canal* or river*)) and (work* or renewal or volunteer* or voluntary or practical or participat* or regenerat* or restor* or maintain* or enhance or preserve or creat*))
#31.#28 or #29 or #30
#32.#9 or #15 or #18 or #27 or #31
#33.(clinical or surgery or surgical or cell or cells or laboratory or placebo or bladder or uterus or breast or gene or genes or genetic or bowel or liver or enzymes or viral or lymph or molecular)
#34.#32 not #33
Hits: (Cochrane Review 9; DARE 11; Central 149; Methods 8; HTA 6; NHS EEDS 4)
Notes: The volume which some of the mesh lines attracted (e.g. #8) were low enough that they were not focused down as elsewhere (i.e. MEDLINE.)
File Saved: COCHRANE RIS 187.txt
8.
Database(s): EMBASE
Host: OVID
Data Parameters: 1980 to 2012 Week 39
Date Searched: Wednesday 3rd October 2012
Searched By: CC
Strategy Checked by: KH, RL and RG
Search Strategy:

#	Searches	Results
1	(conservation$ and natural and environment$ and (renewal or volunteer$ or voluntary or participat$ or practical or regenerat$ or restor$ or maintain$ or care or enhance$ or preserve or creat$ or activ$ or action$ or involve$)).ti,ab	513
2	(Conservation adj3 interventions).ti,ab.	39
3	((environmental$ adj3 (conservation$ or volunteer$ or steward$)) and (Regenerat$ or restore or restoration or redevelop or maintain or enhance or preserve or preserving or create or creation or establish or establishing or founding or build$ or cultivat$ or cultivation or participate or participation)).ti,ab	141
4	(conservation$ adj3 (group$ or volunteer$ or voluntary or association$ or organisation$ or organization$ or participa$ or stakeholder$ or steward$ or trust or ranger$ or activit$)).ti,ab	905
5	(conservation$ adj5 (nature or rural or countryside or outdoor$ or outside or backcountry or hinterland or outback or wood$ or park$1 or parkland or garden$ or meadow$ or farm$ or (farm adj1 land) or horticultural or botanical or arboretum or allotment$ or forest$ or rainforest or moor$ or dale$1 or marsh$ or mountain$ or beach$ or wilderness or landscape$ or tree$ or copse$ or river$ or lake$ or canal$ or waterway or wetland$ or (open adj1 space$) or (protected adj1 area$) or green$ or planning$ or footpath$ or trail$ or coast$ or cliff$ or dune$ or (bio adj1 diversity) or (eco adj1 system) or (protected adj1 area$))).ti,ab	2335
6	(geoconservation or (geo adj3 conservation)).ti,ab.	1
7	((activ$ or practical or participat$) adj3 conservation$).ti,ab	575
8	environmental protection/	26903
9	(volunteer$ or voluntary).ti,ab. or (*voluntary worker/ or *consumer/ or *health status/)	237500
10	8 and 9	297
11	1 or 2 or 3 or 4 or 5 or 6 or 7 or 10	4121
12	((Volunteer$ or voluntary) adj5 (environment$ or nature or rural or countryside or outdoor$ or outside or backcountry or hinterland or outback or wood$ or park$1 or parkland or garden$ or meadow$ or horticultural or botanical or arboretum or allotment$ or forest$ or rainforest or moor$ or dale$1 or	1302

(*Continued*)

	marsh$ or mountain$ or beach$ or wilderness or landscape$ or tree$ or copse$ or river$ or lake$ or canal$ or waterway or wetland$ or (open adj1 space$) or (protected adj1 area$) or green$ or planning$ or footpath$ or trail$ or coast$ or cliff$ or dune$ or (bio adj1 diversity) or (eco adj1 system) or (protected adj1 area$))).ti,ab	
13	(((voluntary or volunteer$) adj5 (group$ or association or stakeholder$ or steward$ or ranger$)) and (environment$ or nature or rural or countryside or outdoor$ or outside or backcountry or hinterland or outback or wood$ or park$1 or parkland or garden$ or meadow$ or horticultural or botanical or arboretum or allotment$ or forest$ or rainforest or moor$ or dale$1 or marsh$ or mountain$ or beach$ or wilderness or landscape$ or tree$ or copse$ or river$ or lake$ or canal$ or waterway or wetland$ or (open adj1 space$) or (protected adj1 area$) or green$ or planning$ or footpath$ or trail$ or coast$ or cliff$ or dune$ or (bio adj1 diversity) or (eco adj1 system) or (protected adj1 area$))).ti,ab	816
14	*voluntary worker/	3156
15	(environment$ or nature or rural or countryside or outdoor$ or outside or backcountry or hinterland or outback or wood$ or park$1 or parkland or garden$ or meadow$ or horticultural or botanical or arboretum or allotment$ or forest$ or rainforest or moor$ or dale$1 or marsh$ or mountain$ or beach$ or wilderness or landscape$ or tree$ or copse$ or river$ or lake$ or canal$ or waterway or wetland$ or (open adj1 space$) or (protected adj1 area$) or green$ or planning$ or footpath$ or trail$ or coast$ or cliff$ or dune$ or (bio adj1 diversity) or (eco adj1 system) or (protected adj1 area$)).ti,ab	1605301
16	14 and 15	211
17	12 or 13 or 16	2208
18	(Green$ adj3 (space$ or gym or exercise or volunteer$ or voluntary or conservation or infrastructure or care or streets or communal or Guerrilla)).ti,ab	503
19	greenspace.ti,ab.	33
20	18 or 19	534
21	(urban adj3 (green$ or park$1 or parkland or garden$ or horticultur$ or wood$ or forest$ or botanical or arboretum or allotment$ or (open adj1 space))).ti,ab	756

(*Continued*)

22	((work$ or renewal or volunteer$ or voluntary or practical or regenerat$ or restor$ or maintain$ or care or enhance or preserve or creat$) and (urban or city or metropolis or town$) and (garden$ or park$1 or parkland or allotment$)).ti,ab	450
23	*city/ and ((work$ or renewal or volunteer$ or voluntary or practical or regenerat$ or restor$ or maintain$ or care or enhance or preserve or creat$) and (garden$ or park$1 or parkland or allotment$)).ti,ab	8
24	*health/ and (environmental protection/ or voluntary worker/)	207
25	21 or 22 or 23 or 24	1356
26	((garden$ or horticulture or allotment$ or botanical or arboretum) adj5 (kitchen or school$ or college$ or university or campus or hospital$ or prison$ or penitentiary or institution or urban or green$ or communit$ or communal or group$ or guerrilla or (bio adj1 diver$) or eco or ((grow or pick) adj3 your own))).ti,ab	794
27	((garden$ or horticulture or allotment$ or botanical or arboretum) adj5 (maintain$ or creat$ or culivat$ or enhance$ or preserve or voluntary or volunteer or conservation$ or participat$)).ti,ab	172
28	*gardening/ and (environmental protection/ or voluntary worker/)	6
29	*Gardening/ and (kitchen or school$ or college$ or university or campus or hospital$ or prison$ or penitentiary or institution or urban or green$ or communit$ or communal or group$ or guerrilla or (bio adj1 diver$) or eco or maintain$ or creat$ or culivat$ or voluntary or volunteer or conservation$ or participat$).ti,ab	108
30	26 or 27 or 28 or 29	979
31	((communit$ adj5 (group$ or team$ or association$ or organisation or organization or participa$ or stakeholder$ or steward$ or trust$ or ranger$ or activit$)) and (garden$ or allotment$ or forest or (natural and environment) or conservation$)).ti,ab	433
32	(communit$ and (work$ or renewal or volunteer$ or voluntary or practical or regenerat$ or restor$ or maintain$ or care or enhance$ or preserve or creat$ or activ$ or action$ or involve$) and ((natur$ adj3 environment$) or (environmental$ and conservation$))).ti,ab	639

(*Continued*)

33	(((communit$ or local) adj5 (garden$ or park$ or green$ or greenspace or outdoor$ or outside$ or pavement$ or sidewalk$ or wood$ or allotment$ or lake$ or canal$ or river$)) and (work$ or renewal or volunteer$ or voluntary or practical or participat$ or regenerat$ or restor$ or maintain$ or enhance or preserve or creat$)).ti,ab	1083
34	31 or 32 or 33	2039
35	11 or 17 or 20 or 25 or 30 or 34	10492
36	(clinical or surgery or surgical or cell or cells or laboratory or placebo or bladder or uterus or breast or gene or genes or genetic or bowel or liver or enzymes or viral or lymph or molecular).mp	13045140
37	35 not 36	6664
38	exp animals/	1794892
39	37 not 38	5816
40	limit 39 to english language	5305
41	limit 40 to yr="1990 -Current"	4908

Hits: 4908
Notes: N/A
File Saved: Embase RIS 4908.txt
9.
Database(s): Web of Science (SCI-EXPANDED; SSCI; A&HCI; CPCI-S; CPCI-SSH)
Host: ISI
Data Parameters: 1899-Present
Date Searched: Wednesday 3rd October 2012
Searched By: CC
Strategy Checked by: KH, RL and RG
Search Strategy:

# 1	3,558	Topic=(((conservation* and natural and environment* and (renewal or volunteer* or voluntary or participat* or practical or regenerat* or restor* or maintain* or care or enhance* or preserve or creat* or activ* or action* or involve*)))) *Databases=SCI-EXPANDED, SSCI, A&HCI, CPCI-S, CPCI-SSH Timespan=All Years Lemmatization=Off*
# 2	198	Topic=(((Conservation NEAR/3 interventions))) Databases=SCI-EXPANDED, SSCI, A&HCI, CPCI-S, CPCI-SSH Timespan=All Years Lemmatization=Off

(*Continued*)

# 3	1,591	Topic=((((environmental* NEAR/3 (conservation* or volunteer* or steward*)) AND (Regenerat* or restore or restoration or redevelop or maintain or enhance or preserve or preserving or create or creation or establish or establishing or founding or build* or cultivat* or cultivation or participati* or practical or creat* or activ* or action* or involve*)))) Databases=SCI-EXPANDED, SSCI, A&HCI, CPCI-S, CPCI-SSH Timespan=All Years Lemmatization=Off
# 4	2,744	Topic=((((conservation* NEAR/3 (group* or volunteer* or voluntary or association* or organisation* or organization* or participa* or stakeholder* or steward* or trust or ranger* or activit*)) AND (Regenerat* or restore or restoration or redevelop or maintain or enhance or preserve or preserving or create or creation or establish or establishing or founding or build* or cultivat* or cultivation or participati* or practical or creat* or activ* or action* or involve*)))) Databases=SCI-EXPANDED, SSCI, A&HCI, CPCI-S, CPCI-SSH Timespan=All Years Lemmatization=Off
# 5	11,400	Topic=((((conservation* NEAR/5 (nature or rural or countryside or outdoor* or outside or backcountry or hinterland or outback or wood* or park* or parkland or garden* or meadow* or farm* or (farm NEAR/1 land) or horticultural or floricultural or botanical or arboretum or allotment* or forest* or rainforest or moor* or dale*1 or marsh* or mountain* or beach* or wilderness or landscape* or tree* or copse* or river* or lake* or canal* or waterway or wetland* or (open NEAR/1 space*) or (protected NEAR/1 area*) or green* or planning* or footpath* or trail* or coast* or cliff* or dune* or (bio NEAR/1 diversity) or (eco NEAR/1 system) or (protected NEAR/1 area*))) and (Regenerat* or restore or restoration or redevelop or maintain or enhance or preserve or preserving or create or creation or establish or establishing or founding or build* or cultivat* or cultivation or participati* or practical or creat* or activ* or action* or involve*)))) Databases=SCI-EXPANDED, SSCI, A&HCI, CPCI-S, CPCI-SSH Timespan=All Years Lemmatization=Off
# 6	49	Topic=(((geoconservation or (geo NEAR/3 conservation)))) Databases=SCI-EXPANDED, SSCI, A&HCI, CPCI-S, CPCI-SSH Timespan=All Years Lemmatization=Off
# 7	2,510	Topic=((((activ* or practical or participat*) NEAR/3 conservation*))) Databases=SCI-EXPANDED, SSCI, A&HCI, CPCI-S, CPCI-SSH Timespan=All Years Lemmatization=Off
# 8	17,444	#7 OR #6 OR #5 OR #4 OR #3 OR #2 OR #1 Databases=SCI-EXPANDED, SSCI, A&HCI, CPCI-S, CPCI-SSH Timespan=All Years Lemmatization=Off
# 9	1,454	Topic=(((((volunteer* or voluntary) NEAR/5 (environment* or nature or rural or countryside or outdoor* or outside or backcountry or hinterland or outback or wood* or park* or parkland or garden* or meadow* or farm* or (farm NEAR/1 land) or horticultural or floricultural or botanical or arboretum or allotment* or forest* or rainforest or moor* or dale*1 or marsh* or mountain* or beach* or wilderness or landscape* or tree* or copse* or river* or lake* or canal* or waterway or wetland* or (open NEAR/1 space*) or (protected NEAR/1 area*) or green* or planning* or footpath* or trail* or coast* or cliff* or dune* or (bio NEAR/1 diversity) or (eco NEAR/1 system) or (protected NEAR/1 area*))) and (Regenerat* or restore or restoration or redevelop or maintain or enhance or preserve or preserving or create or creation or establish or establishing or founding or build* or cultivat* or cultivation or participati* or practical or creat* or activ* or action* or involve*)))) Databases=SCI-EXPANDED, SSCI, A&HCI, CPCI-S, CPCI-SSH Timespan=All Years

(*Continued*)

		Lemmatization=Off
# 10	535	Topic=((((((voluntary or volunteer*) NEAR/5 (group* or association or stakeholder* or steward* or ranger*)) and (environment* or nature or rural or countryside or outdoor* or outside or backcountry or hinterland or outback or wood* or park* or parkland or garden* or meadow* or farm* or (farm NEAR/1 land) or horticultural or floricultural or botanical or arboretum or allotment* or forest* or rainforest or moor* or dale*1 or marsh* or mountain* or beach* or wilderness or landscape* or tree* or copse* or river* or lake* or canal* or waterway or wetland* or (open NEAR/1 space*) or (protected NEAR/1 area*) or green* or planning* or footpath* or trail* or coast* or cliff* or dune* or (bio NEAR/1 diversity) or (eco NEAR/1 system) or (protected NEAR/1 area*))) and (Regenerat* or restore or restoration or redevelop or maintain or enhance or preserve or preserving or create or creation or establish or establishing or founding or build* or cultivat* or cultivation or participati* or practical or creat* or activ* or action* or involve*)))) Databases=SCI-EXPANDED, SSCI, A&HCI, CPCI-S, CPCI-SSH Timespan=All Years Lemmatization=Off
# 11	1,894	#10 OR #9 Databases=SCI-EXPANDED, SSCI, A&HCI, CPCI-S, CPCI-SSH Timespan=All Years Lemmatization=Off
# 12	3,171	Topic=(((Green* NEAR/3 (space* or gym or exercise or volunteer* or voluntary or conservation or infrastructure or care or streets or communal or Guerrilla)))) Databases=SCI-EXPANDED, SSCI, A&HCI, CPCI-S, CPCI-SSH Timespan=All Years Lemmatization=Off
# 13	123	Topic=((greenspace)) Databases=SCI-EXPANDED, SSCI, A&HCI, CPCI-S, CPCI-SSH Timespan=All Years Lemmatization=Off
# 14	3,271	#13 OR #12 Databases=SCI-EXPANDED, SSCI, A&HCI, CPCI-S, CPCI-SSH Timespan=All Years Lemmatization=Off
# 15	2,054	Topic=((((urban NEAR/3 (green* or park* or parkland or garden* or horticultur* or wood* or forest* or botanical or arboretum or allotment* or (open NEAR/1 space))) and (Regenerat* or restore or restoration or redevelop or maintain or enhance or preserve or preserving or create or creation or establish or establishing or founding or build* or cultivat* or cultivation or participati* or practical or creat* or activ* or action* or involve*)))) Databases=SCI-EXPANDED, SSCI, A&HCI, CPCI-S, CPCI-SSH Timespan=All Years Lemmatization=Off
# 16	646	Topic=((((work* or renewal or volunteer* or voluntary or practical or regenerat* or restor* or maintain* or care or enhance or preserve or creat*) and (urban or city or metropolis or town*) and (garden* or park*1 or parkland or allotment*)))) Databases=SCI-EXPANDED, SSCI, A&HCI, CPCI-S, CPCI-SSH Timespan=All Years Lemmatization=Off
# 17	2,561	#16 OR #15 Databases=SCI-EXPANDED, SSCI, A&HCI, CPCI-S, CPCI-SSH Timespan=All Years Lemmatization=Off

(*Continued*)

# 18	2,978	Topic=((((garden* or horticulture or allotment* or botanical or arboretum) NEAR/5 (kitchen or school* or college* or university or campus or hospital* or prison* or penitentiary or institution or urban or green* or communit* or communal or group* or guerrilla or (bio NEAR/1 diver*) or eco)))) Databases=SCI-EXPANDED, SSCI, A&HCI, CPCI-S, CPCI-SSH Timespan=All Years Lemmatization=Off
# 19	2	Topic=((((garden* or horticulture or allotment* or botanical or arboretum) and (grow and (your own))))) Databases=SCI-EXPANDED, SSCI, A&HCI, CPCI-S, CPCI-SSH Timespan=All Years Lemmatization=Off
# 20	3	Topic=((((garden* or horticulture or allotment* or botanical or arboretum) and (pick and (your own))))) Databases=SCI-EXPANDED, SSCI, A&HCI, CPCI-S, CPCI-SSH Timespan=All Years Lemmatization=Off
# 21	1,715	Topic=((((garden* or horticulture or allotment* or botanical or arboretum) NEAR/5 (renew* or maintain* or creat* or culivat* or enhance* or restore or regenerat* or activ* or preserve or voluntary or volunteer or conservation* or participat*)))) Databases=SCI-EXPANDED, SSCI, A&HCI, CPCI-S, CPCI-SSH Timespan=All Years Lemmatization=Off
# 22	4,451	#21 OR #20 OR #19 OR #18 Databases=SCI-EXPANDED, SSCI, A&HCI, CPCI-S, CPCI-SSH Timespan=All Years Lemmatization=Off
# 23	2,173	Topic=(((((communit* NEAR/5 (group* or team* or association* or organisation or organization or participa* or stakeholder* or steward* or trust* or ranger* or activit*)) and (garden* or allotment* or forest or (natural and environment) or conservation*)) and (Regenerat* or restore or restoration or redevelop or maintain or enhance or preserve or preserving or create or creation or establish or establishing or founding or build* or cultivat* or cultivation or participati* or practical or creat* or activ* or action* or involve*)))) Databases=SCI-EXPANDED, SSCI, A&HCI, CPCI-S, CPCI-SSH Timespan=All Years Lemmatization=Off
# 24	2,061	Topic=((((communit* and (work* or renewal or volunteer* or voluntary or practical or regenerat* or restor* or maintain* or care or enhance* or preserve or creat* or activ* or action* or involve*) and ((natur* adj3 environment*) or (environmental* and conservation*))) and (Regenerat* or restore or restoration or redevelop or maintain or enhance or preserve or preserving or create or creation or establish or establishing or founding or build* or cultivat* or cultivation or participati* or practical or creat* or activ* or action* or involve*)))) Databases=SCI-EXPANDED, SSCI, A&HCI, CPCI-S, CPCI-SSH Timespan=All Years Lemmatization=Off
# 25	4,807	Topic=(((((communit* or local) NEAR/5 (garden* or park* or green* or greenspace or outdoor* or outside* or pavement* or sidewalk* or wood* or allotment* or lake* or canal* or river*)) and (work* or renewal or volunteer* or voluntary or practical or participat* or regenerat* or restor* or maintain* or enhance or preserve or creat*)))) Databases=SCI-EXPANDED, SSCI, A&HCI, CPCI-S, CPCI-SSH Timespan=All Years Lemmatization=Off
# 26	8,502	#25 OR #24 OR #23 Databases=SCI-EXPANDED, SSCI, A&HCI, CPCI-S, CPCI-SSH Timespan=All Years Lemmatization=Off

(*Continued*)

# 27	34,147	#26 OR #22 OR #17 OR #14 OR #11 OR #8 Databases=SCI-EXPANDED, SSCI, A&HCI, CPCI-S, CPCI-SSH Timespan=All Years Lemmatization=Off
# 28	1,624,238	Topic=(((Health* or (quality NEAR/3 life) or (well NEAR/3 being) or wellbeing or emotion*))) Databases=SCI-EXPANDED, SSCI, A&HCI, CPCI-S, CPCI-SSH Timespan=All Years Lemmatization=Off
# 29	3,335	#28 AND #27 Databases=SCI-EXPANDED, SSCI, A&HCI, CPCI-S, CPCI-SSH Timespan=All Years Lemmatization=Off
# 30	9,401,073	Topic=((((clinical or surgery or surgical or cell or cells or laboratory or placebo or bladder or uterus or breast or gene or genes or genetic or bowel or liver or enzymes or viral or lymph or molecular)))) Databases=SCI-EXPANDED, SSCI, A&HCI, CPCI-S, CPCI-SSH Timespan=All Years Lemmatization=Off
# 31	2,793	#29 NOT #30 Databases=SCI-EXPANDED, SSCI, A&HCI, CPCI-S, CPCI-SSH Timespan=All Years Lemmatization=Off
# 32	2,700	#29 NOT #30 Refined by: Languages=(ENGLISH) Databases=SCI-EXPANDED, SSCI, A&HCI, CPCI-S, CPCI-SSH Timespan=All Years Lemmatization=Off

Hits: 2700
Notes: N/A
File Saved: WOS RIS 2700.txt
10.
Database(s): British Nursing Index (BNI)
Host: ProQuest
Data Parameters: 1994-Current
Date Searched: Wednesday 3rd October 2012
Searched By: CC
Strategy Checked by: KH, RL and RG
Search Strategy:

Set#	Searched for	Databases	Results
S1	ti((conservation* AND natural AND environment* AND (renewal OR volunteer* OR voluntary OR participat* OR practical OR regenerat* OR restor* OR maintain* OR care OR enhance* OR preserve OR creat* OR ac-	British Nursing Index	0

(*Continued*)

	tiv* OR action* OR involve*))) OR ab((conservation* AND natural AND environment* AND (renewal OR volunteer* OR voluntary OR participat* OR practical OR regenerat* OR restor* OR maintain* OR care OR enhance* OR preserve OR creat* OR activ* OR action* OR involve*))) AND pd(19900101-20121002)		
S2	ti((Conservation NEAR/3 interventions)) OR ab((Conservation NEAR/3 interventions)) AND pd(19900101-20121002)	British Nursing Index	1
S3	ti(((environmental* NEAR/3 (conservation* OR volunteer* OR steward*)) AND (Regenerat* OR restore OR restoration OR redevelop OR maintain OR enhance OR preserve OR preserving OR create OR creation OR establish OR establishing OR founding OR build* OR cultivat* OR cultivation OR participate OR participation))) OR ab(((environmental* NEAR/3 (conservation* OR volunteer* OR steward*)) AND (Regenerat* OR restore OR restoration OR redevelop OR maintain OR enhance OR preserve OR preserving OR create OR creation OR establish OR establishing OR founding OR build* OR cultivat* OR cultivation OR participate OR participation))) AND pd(19900101-20121002)	British Nursing Index	1
S4	ti((conservation* NEAR/3 (group* OR volunteer* OR voluntary OR associa-	British Nursing Index	6

(*Continued*)

	tion* OR organisation* OR organization* OR participa* OR stakeholder* OR steward* OR trust OR ranger* OR activit*))) OR ab((conservation* NEAR/3 (group* OR volunteer* OR voluntary OR association* OR organisation* OR organization* OR participa* OR stakeholder* OR steward* OR trust OR ranger* OR activit*))) AND pd(19900101-20121002)		
S5	ti((conservation* NEAR/5 (nature OR rural OR countryside OR outdoor* OR outside OR backcountry OR hinterland OR outback OR wood* OR park* OR parkland OR garden* OR meadow* OR farm* OR (farm NEAR/1 land) OR horticultural OR floricultural OR botanical OR arboretum OR allotment* OR forest* OR rainforest OR moor* OR dale* OR marsh* OR mountain* OR beach* OR wilderness OR landscape* OR tree* OR copse* OR river* OR lake* OR canal* OR waterway OR wetland* OR (open NEAR/1 space*) OR (protected NEAR/1 area*) OR green* OR planning* OR footpath* OR trail* OR coast* OR cliff* OR dune* OR (bio NEAR/1 diversity) OR (eco NEAR/1 system) OR (protected NEAR/1 area*)))) OR ab((conservation* NEAR/5 (nature OR rural OR countryside OR outdoor* OR outside OR backcountry OR hinterland OR outback OR wood* OR park* OR parkland OR garden* OR meadow* OR farm*	British Nursing Index	1

(*Continued*)

	OR (farm NEAR/1 land) OR horticultural OR floricultural OR botanical OR arboretum OR allotment* OR forest* OR rainforest OR moor* OR dale* OR marsh* OR mountain* OR beach* OR wilderness OR landscape* OR tree* OR copse* OR river* OR lake* OR canal* OR waterway OR wetland* OR (open NEAR/1 space*) OR (protected NEAR/1 area*) OR green* OR planning* OR footpath* OR trail* OR coast* OR cliff* OR dune* OR (bio NEAR/1 diversity) OR (eco NEAR/1 system) OR (protected NEAR/1 area*)))) AND pd (19900101-20121002)		
S6	ti((geoconservation OR (geo NEAR/3 conservation))) OR ab((geoconservation OR (geo NEAR/3 conservation))) AND pd(19900101-20121002)	British Nursing Index	0
S7	ti(((activ* OR practical OR participat*) NEAR/3 conservation*)) OR ab(((activ* OR practical OR participat*) NEAR/3 conservation*)) AND pd(19900101-20121002)	British Nursing Index	2
S8	S1 OR S2 OR S3 OR S4 OR S5 OR S6 OR S7	British Nursing Index	8
S9	ti (((Volunteer* OR voluntary) NEAR/5 (environment* OR nature OR rural OR countryside OR outdoor* OR outside OR backcountry OR hinterland OR outback OR wood* OR park* OR parkland OR garden* OR meadow* OR	British Nursing Index	12

(*Continued*)

	farm* OR (farm NEAR/1 land) OR horticultural OR botanical OR arboretum OR allotment* OR forest* OR rainforest OR moor* OR dale* OR marsh* OR mountain* OR beach* OR wilderness OR landscape* OR tree* OR copse* OR river* OR lake* OR canal* OR waterway OR wetland* OR (open NEAR/1 space*) OR (protected NEAR/1 area*) OR green* OR planning* OR footpath* OR trail* OR coast* OR cliff* OR dune* OR (bio NEAR/1 diversity) OR (eco NEAR/1 system) OR (protected NEAR/1 area*)))) OR ab(((Volunteer* OR voluntary) NEAR/5 (environment* OR nature OR rural OR countryside OR outdoor* OR outside OR backcountry OR hinterland OR outback OR wood* OR park* OR parkland OR garden* OR meadow* OR farm* OR (farm NEAR/1 land) OR horticultural OR botanical OR arboretum OR allotment* OR forest* OR rainforest OR moor* OR dale* OR marsh* OR mountain* OR beach* OR wilderness OR landscape* OR tree* OR copse* OR river* OR lake* OR canal* OR waterway OR wetland* OR (open NEAR/1 space*) OR (protected NEAR/1 area*) OR green* OR planning* OR footpath* OR trail* OR coast* OR cliff* OR dune* OR (bio NEAR/1 diversity) OR (eco NEAR/1 system) OR (protected NEAR/1 area*)))) AND pd (19900101-20121002)		

(*Continued*)

S10	ti((((voluntary OR volunteer*) NEAR/5 (group* OR association OR stakeholder* OR steward* OR ranger*)) AND (environment* OR nature OR rural OR countryside OR outdoor* OR outside OR backcountry OR hinterland OR outback OR wood* OR park* OR parkland OR garden* OR meadow* OR farm* OR (farm NEAR/1 land) OR horticultural OR floricultural OR botanical OR arboretum OR allotment* OR forest* OR rainforest OR moor* OR dale* OR marsh* OR mountain* OR beach* OR wilderness OR landscape* OR tree* OR copse* OR river* OR lake* OR canal* OR waterway OR wetland* OR (open NEAR/1 space*) OR (protected NEAR/1 area*) OR green* OR planning* OR footpath* OR trail* OR coast* OR cliff* OR dune* OR (bio NEAR/1 diversity) OR (eco NEAR/1 system) OR (protected NEAR/1 area*)))) OR ab((((voluntary OR volunteer*) NEAR/5 (group* OR association OR stakeholder* OR steward* OR ranger*)) AND (environment* OR nature OR rural OR countryside OR outdoor* OR outside OR backcountry OR hinterland OR outback OR wood* OR park* OR parkland OR garden* OR meadow* OR farm* OR (farm NEAR/1 land) OR horticultural OR floricultural OR botanical OR arboretum OR allotment* OR forest* OR rain-	British Nursing Index	5

(*Continued*)

	forest OR moor* OR dale* OR marsh* OR mountain* OR beach* OR wilderness OR landscape* OR tree* OR copse* OR river* OR lake* OR canal* OR waterway OR wetland* OR (open NEAR/1 space*) OR (protected NEAR/1 area*) OR green* OR planning* OR footpath* OR trail* OR coast* OR cliff* OR dune* OR (bio NEAR/1 diversity) OR (eco NEAR/1 system) OR (protected NEAR/1 area*)))) AND pd (19900101-20121002)		
S11	S9 or S10	British Nursing Index	16
S12	ti((Green* NEAR/3 (space* OR gym OR exercise OR volunteer* OR voluntary OR conservation OR infrastructure OR care OR streets OR communal OR Guerrilla))) OR ab((Green* NEAR/3 (space* OR gym OR exercise OR volunteer* OR voluntary OR conservation OR infrastructure OR care OR streets OR communal OR Guerrilla))) AND pd(19900101-20121002)	British Nursing Index	27
S13	ti(greenspace) OR ab(greenspace) AND pd (19900101-20121002)	British Nursing Index	1
S14	S12 or S13	British Nursing Index	28
S15	ti((urban NEAR/3 (green* OR park* OR parkland OR garden* OR horticultur* OR wood* OR forest* OR botanical OR arboretum OR allotment* OR (open NEAR/1 space)))) OR ab((urban NEAR/3 (green* OR park* OR park-	British Nursing Index	1

(*Continued*)

	land OR garden* OR horticultur* OR wood* OR forest* OR botanical OR arboretum OR allotment* OR (open NEAR/1 space)))) AND pd (19900101-20121002)		
S16	ti(((work* OR renewal OR volunteer* OR voluntary OR practical OR regenerat* OR restor* OR maintain* OR care OR enhance OR preserve OR creat*) AND (urban OR city OR metropolis OR town*) AND (garden* OR park* OR parkland OR allotment*))) OR ab(((work* OR renewal OR volunteer* OR voluntary OR practical OR regenerat* OR restor* OR maintain* OR care OR enhance OR preserve OR creat*) AND (urban OR city OR metropolis OR town*) AND (garden* OR park* OR parkland OR allotment*))) AND pd (19900101-20121002)	British Nursing Index	5
S17	S15 or S16	British Nursing Index	6
S18	ti(((garden* OR horticulture OR allotment* OR botanical OR arboretum) NEAR/5 (kitchen OR school* OR college* OR university OR campus OR hospital* OR prison* OR penitentiary OR institution OR urban OR green* OR communit* OR communal OR group* OR guerrilla OR (bio NEAR/1 diver*) OR eco))) OR ab(((garden* OR horticulture OR allotment* OR botanical OR arboretum) NEAR/5 (kitchen OR school* OR college* OR university OR campus OR hospital* OR prison*	British Nursing Index	15

(*Continued*)

	OR penitentiary OR institution OR urban OR green* OR communit* OR communal OR group* OR guerrilla OR (bio NEAR/1 diver*) OR eco))) AND pd(19900101-20121002)		
S19	ti(((grow OR pick) AND (your own))) OR ab((grow OR pick) AND (your own))) AND pd(19900101-20121002)	British Nursing Index	3
S20	ti(((garden* OR horticulture OR allotment* OR botanical OR arboretum) NEAR/5 (maintain* OR creat* OR culivat* OR enhance* OR preserve OR voluntary OR volunteer OR conservation* OR participat*))) OR ab((garden* OR horticulture OR allotment* OR botanical OR arboretum) NEAR/5 (maintain* OR creat* OR culivat* OR enhance* OR preserve OR voluntary OR volunteer OR conservation* OR participat*))) AND pd(19900101-20121002)	British Nursing Index	7
S21	S18 or S19 or S20	British Nursing Index	21
S22	ti(((communit* NEAR/5 (group* OR team* OR association* OR organisation OR organization OR participa* OR stakeholder* OR steward* OR trust* OR ranger* OR activit*)) AND (garden* OR allotment* OR forest OR (natural AND environment) OR conservation*))) OR ab(((communit* NEAR/5 (group* OR team* OR association* OR organisation OR organization OR participa* OR stakeholder* OR stew-	British Nursing Index	4

(*Continued*)

	ard* OR trust* OR ranger* OR activit*)) AND (garden* OR allotment* OR forest OR (natural AND environment) OR conservation*))) AND pd(19900101-20121002)		
S23	ti((communit* AND (work* OR renewal OR volunteer* OR voluntary OR practical OR regenerat* OR restor* OR maintain* OR care OR enhance* OR preserve OR creat* OR activ* OR action* OR involve*) AND ((natur* NEAR/3 environment*) OR (environmental* AND conservation*)))) OR ab((communit* AND (work* OR renewal OR volunteer* OR voluntary OR practical OR regenerat* OR restor* OR maintain* OR care OR enhance* OR preserve OR creat* OR activ* OR action* OR involve*) AND ((natur* NEAR/3 environment*) OR (environmental* AND conservation*)))) AND pd(19900101-20121002)	British Nursing Index	2
S24	ti((((communit* OR local) NEAR/5 (garden* OR park* OR green* OR greenspace OR outdoor* OR outside* OR pavement* OR sidewalk* OR wood* OR allotment* OR lake* OR canal* OR river*)) AND (work* OR renewal OR volunteer* OR voluntary OR practical OR participat* OR regenerat* OR restor* OR maintain* OR enhance OR preserve OR creat*))) OR ab((((communit* OR local) NEAR/5 (garden* OR park* OR green* OR greenspace OR outdoor* OR outside* OR pavement*	British Nursing Index	7

(*Continued*)

	OR sidewalk* OR wood* OR allotment* OR lake* OR canal* OR river*)) AND (work* OR renewal OR volunteer* OR voluntary OR practical OR participat* OR regenerat* OR restor* OR maintain* OR enhance OR preserve OR creat*))) AND pd(19900101-20121002)		
S25	S22 or S23 or S24	British Nursing Index	11
S26	S8 or S11 or S14 or S17 or S21 or S25	British Nursing Index	78

Hits: 78
Notes: N/A
File Saved: BNI RIS 78.txt
11.
Database(s): British Education Index (BEI)
Host: ProQuest
Data Parameters: 1975-Current
Date Searched: Wednesday 3rd October 2012
Searched By: CC
Strategy Checked by: KH, RL and RG
Search Strategy:

Set#	Searched for	Databases	Results
S1	ti((conservation* AND natural AND environment* AND (renewal OR volunteer* OR voluntary OR participat* OR practical OR regenerat* OR restor* OR maintain* OR care OR enhance* OR preserve OR creat* OR activ* OR action* OR involve*))) OR ab((conservation* AND natural AND environment* AND (renewal OR volunteer* OR voluntary OR participat* OR practical OR regenerat* OR restor* OR maintain* OR care OR enhance* OR preserve OR	British Education Index	1

(*Continued*)

	creat* OR activ* OR action* OR involve*))) AND pd(19900101-20121002)		
S2	ti((Conservation NEAR/3 interventions)) OR ab((Conservation NEAR/3 interventions)) AND pd(19900101-20121002)	British Education Index	0
S3	ti(((environmental* NEAR/3 (conservation* OR volunteer* OR steward*)) AND (Regenerat* OR restore OR restoration OR redevelop OR maintain OR enhance OR preserve OR preserving OR create OR creation OR establish OR establishing OR founding OR build* OR cultivat* OR cultivation OR participate OR participation)) OR ab(((environmental* NEAR/3 (conservation* OR volunteer* OR steward*)) AND (Regenerat* OR restore OR restoration OR redevelop OR maintain OR enhance OR preserve OR preserving OR create OR creation OR establish OR establishing OR founding OR build* OR cultivat* OR cultivation OR participate OR participation))) AND pd(19900101-20121002)	British Education Index	4
S4	ti((conservation* NEAR/3 (group* OR volunteer* OR voluntary OR association* OR organisation* OR organization* OR participa* OR stakeholder* OR steward* OR trust OR ranger* OR activit*))) OR ab((conservation* NEAR/3 (group* OR volunteer* OR voluntary OR association* OR organisation* OR organization* OR	British Education Index	0

(*Continued*)

	participa* OR stakeholder* OR steward* OR trust OR ranger* OR activit*))) AND pd(19900101-20121002)		
S5	ti((conservation* NEAR/5 (nature OR rural OR countryside OR outdoor* OR outside OR backcountry OR hinterland OR outback OR wood* OR park* OR parkland OR garden* OR meadow* OR farm* OR (farm NEAR/1 land) OR horticultural OR botanical OR arboretum OR allotment* OR forest* OR rainforest OR moor* OR dale* OR marsh* OR mountain* OR beach* OR wilderness OR landscape* OR tree* OR copse* OR river* OR lake* OR canal* OR waterway OR wetland* OR (open NEAR/1 space*) OR (protected NEAR/1 area*) OR green* OR planning* OR footpath* OR trail* OR coast* OR cliff* OR dune* OR (bio NEAR/1 diversity) OR (eco NEAR/1 system) OR (protected NEAR/1 area*)))) OR ab((conservation* NEAR/5 (nature OR rural OR countryside OR outdoor* OR outside OR backcountry OR hinterland OR outback OR wood* OR park* OR parkland OR garden* OR meadow* OR farm* OR (farm NEAR/1 land) OR horticultural OR floricultural OR botanical OR arboretum OR allotment* OR forest* OR rainforest OR moor* OR dale* OR marsh* OR mountain* OR beach* OR wilderness OR landscape* OR tree* OR	British Education Index	7

(*Continued*)

	copse* OR river* OR lake* OR canal* OR waterway OR wetland* OR (open NEAR/1 space*) OR (protected NEAR/1 area*) OR green* OR planning* OR footpath* OR trail* OR coast* OR cliff* OR dune* OR (bio NEAR/1 diversity) OR (eco NEAR/1 system) OR (protected NEAR/1 area*)))) AND pd (19900101-20121002)		
S6	ti((geoconservation OR (geo NEAR/3 conservation))) OR ab((geoconservation OR (geo NEAR/3 conservation))) AND pd(19900101-20121002)	British Education Index	0
S7	ti(((activ* OR practical OR participat*) NEAR/3 conservation*)) OR ab(((activ* OR practical OR participat*) NEAR/3 conservation*)) AND pd(19900101-20121002)	British Education Index	0
S8	SU.EXACT.EXPLODE ("Conservation Education")	British Education Index	36
S9	(ti((((nature or rural or countryside or outdoor* or outside or backcountry or hinterland or outback or wood* or park* or parkland or garden* or meadow* or farm* or (farm NEAR/1 land) or horticultural or botanical or arboretum or allotment* or forest* or rainforest or moor* or dale* or marsh* or mountain* or beach* or wilderness or landscape* or tree* or copse* or river* or lake* or canal* or waterway or wetland* or (open NEAR/1 space*) or (protected NEAR/1 area*) or green* or planning* or foot-	British Education Index	5682

(*Continued*)

	path* or trail* or coast* or cliff* or dune* or (bio NEAR/1 diversity) or (eco NEAR/1 system) or (protected NEAR/1 area*))))) OR ab((((nature or rural or countryside or outdoor* or outside or backcountry or hinterland or outback or wood* or park* or parkland or garden* or meadow* or farm* or (farm NEAR/1 land) or horticultural or floricultural or botanical or arboretum or allotment* or forest* or rainforest or moor* or dale* or marsh* or mountain* or beach* or wilderness or landscape* or tree* or copse* or river* or lake* or canal* or waterway or wetland* or (open NEAR/1 space*) or (protected NEAR/1 area*) or green* or planning* or footpath* or trail* or coast* or cliff* or dune* or (bio NEAR/1 diversity) or (eco NEAR/1 system) or (protected NEAR/1 area*))))))		
S10	S8 AND S9	British Education Index	5
S11	(ti((((volunteer* or voluntary)))) OR ab((((volunteer* or voluntary)))))	British Education Index	351
S12	S8 AND S11	British Education Index	0
S13	S1 OR S2 OR S3 OR S4 OR S5 OR S6 OR S7 OR S10 OR S12	British Education Index	16
S14	ti(((Volunteer* OR voluntary) NEAR/5 (environment* OR nature OR rural OR countryside OR outdoor* OR outside OR backcountry OR hinterland OR outback OR wood* OR park* OR parkland OR garden* OR meadow* OR horticultural	British Education Index	8

(*Continued*)

	OR botanical OR arboretum OR allotment* OR forest* OR rainforest OR moor* OR dale* OR marsh* OR mountain* OR beach* OR wilderness OR landscape* OR tree* OR copse* OR river* OR lake* OR canal* OR waterway OR wetland* OR (open NEAR/1 space*) OR (protected NEAR/1 area*) OR green* OR planning* OR footpath* OR trail* OR coast* OR cliff* OR dune* OR (bio NEAR/1 diversity) OR (eco NEAR/1 system) OR (protected NEAR/1 area*)))) OR ab(((Volunteer* OR voluntary) NEAR/5 (environment* OR nature OR rural OR countryside OR outdoor* OR outside OR backcountry OR hinterland OR outback OR wood* OR park* OR parkland OR garden* OR meadow* OR horticultural OR botanical OR arboretum OR allotment* OR forest* OR rainforest OR moor* OR dale* OR marsh* OR mountain* OR beach* OR wilderness OR landscape* OR tree* OR copse* OR river* OR lake* OR canal* OR waterway OR wetland* OR (open NEAR/1 space*) OR (protected NEAR/1 area*) OR green* OR planning* OR footpath* OR trail* OR coast* OR cliff* OR dune* OR (bio NEAR/1 diversity) OR (eco NEAR/1 system) OR (protected NEAR/1 area*)))) AND pd (19900101-20121002)		
S15	ti((((voluntary OR volunteer*) NEAR/5 (group* OR association OR stakeholder* OR steward* OR ranger*))	British Education Index	6

(*Continued*)

	AND (environment* OR nature OR rural OR countryside OR outdoor* OR outside OR backcountry OR hinterland OR outback OR wood* OR park* OR parkland OR garden* OR meadow* OR horticultural OR botanical OR arboretum OR allotment* OR forest* OR rainforest OR moor* OR dale* OR marsh* OR mountain* OR beach* OR wilderness OR landscape* OR tree* OR copse* OR river* OR lake* OR canal* OR waterway OR wetland* OR (open NEAR/1 space*) OR (protected NEAR/1 area*) OR green* OR planning* OR footpath* OR trail* OR coast* OR cliff* OR dune* OR (bio NEAR/1 diversity) OR (eco NEAR/1 system) OR (protected NEAR/1 area*)))) OR ab((((voluntary OR volunteer*) NEAR/5 (group* OR association OR stakeholder* OR steward* OR ranger*)) AND (environment* OR nature OR rural OR countryside OR outdoor* OR outside OR backcountry OR hinterland OR outback OR wood* OR park* OR parkland OR garden* OR meadow* OR horticultural OR botanical OR arboretum OR allotment* OR forest* OR rainforest OR moor* OR dale* OR marsh* OR mountain* OR beach* OR wilderness OR landscape* OR tree* OR copse* OR river* OR lake* OR canal* OR waterway OR wetland* OR (open NEAR/1 space*) OR (protected NEAR/1 area*) OR green*		

(*Continued*)

	OR planning* OR footpath* OR trail* OR coast* OR cliff* OR dune* OR (bio NEAR/1 diversity) OR (eco NEAR/1 system) OR (protected NEAR/1 area*)))) AND pd (19900101-20121002)		
S16	S14 OR S15	British Education Index	14
S17	ti((Green* NEAR/3 (space* OR gym OR exercise OR volunteer* OR voluntary OR conservation OR infrastructure OR care OR streets OR communal OR Guerrilla))) OR ab((Green* NEAR/3 (space* OR gym OR exercise OR volunteer* OR voluntary OR conservation OR infrastructure OR care OR streets OR communal OR Guerrilla))) AND pd(19900101-20121002)	British Education Index	3
S18	ti(greenspace) OR ab(greenspace) AND pd (19900101-20121002)	British Education Index	0
S19	S17 OR S18	British Education Index	3
S20	ti((urban NEAR/3 (green* OR park* OR parkland OR garden* OR horticultur* OR wood* OR forest* OR botanical OR arboretum OR allotment* OR (open NEAR/1 space)))) OR ab((urban NEAR/3 (green* OR park* OR parkland OR garden* OR horticultur* OR wood* OR forest* OR botanical OR arboretum OR allotment* OR (open NEAR/1 space)))) AND pd (19900101-20121002)	British Education Index	11
S21	ti(((work* OR renewal OR volunteer* OR voluntary OR practical OR regenerat* OR	British Education Index	5

(*Continued*)

	restor* OR maintain* OR care OR enhance OR preserve OR creat*) AND (urban OR city OR metropolis OR town*) AND (garden* OR park* OR parkland OR allotment*))) OR ab(((work* OR renewal OR volunteer* OR voluntary OR practical OR regenerat* OR restor* OR maintain* OR care OR enhance OR preserve OR creat*) AND (urban OR city OR metropolis OR town*) AND (garden* OR park* OR parkland OR allotment*))) AND pd (19900101-20121002)		
S22	S20 OR S21	British Education Index	16
S23	ti(((garden* OR horticulture OR allotment* OR botanical OR arboretum) NEAR/5 (kitchen OR school* OR college* OR university OR campus OR hospital* OR prison* OR penitentiary OR institution OR urban OR green* OR communit* OR communal OR group* OR guerrilla OR (bio NEAR/1 diver*) OR eco))) OR ab(((garden* OR horticulture OR allotment* OR botanical OR arboretum) NEAR/5 (kitchen OR school* OR college* OR university OR campus OR hospital* OR prison* OR penitentiary OR institution OR urban OR green* OR communit* OR communal OR group* OR guerrilla OR (bio NEAR/1 diver*) OR eco))) AND pd(19900101-20121002)	British Education Index	17
S24	ti(((grow OR pick) AND (your own))) OR ab((grow OR pick) AND (your	British Education Index	3

(*Continued*)

	own))) AND pd(19900101-20121002)		
S25	ti(((garden* OR horticulture OR allotment* OR botanical OR arboretum) NEAR/5 (maintain* OR creat* OR culivat* OR enhance* OR preserve OR voluntary OR volunteer OR conservation* OR participat*))) OR ab((garden* OR horticulture OR allotment* OR botanical OR arboretum) NEAR/5 (maintain* OR creat* OR culivat* OR enhance* OR preserve OR voluntary OR volunteer OR conservation* OR participat*))) AND pd(19900101-20121002)	British Education Index	3
S26	S23 OR S24 OR S25	British Education Index	22
S27	ti(((communit* NEAR/5 (group* OR team* OR association* OR organisation OR organization OR participa* OR stakeholder* OR steward* OR trust* OR ranger* OR activit*)) AND (garden* OR allotment* OR forest OR (natural AND environment) OR conservation*))) OR ab(((communit* NEAR/5 (group* OR team* OR association* OR organisation OR organization OR participa* OR stakeholder* OR steward* OR trust* OR ranger* OR activit*)) AND (garden* OR allotment* OR forest OR (natural AND environment) OR conservation*))) AND pd(19900101-20121002)	British Education Index	1
S28	ti((communit* AND (work* OR renewal OR volunteer* OR voluntary OR practical OR regenerat* OR restor*	British Education Index	6

(*Continued*)

	OR maintain* OR care OR enhance* OR preserve OR creat* OR activ* OR action* OR involve*) AND ((natur* NEAR/3 environment*) OR (environmental* AND conservation*)))) OR ab((communit* AND (work* OR renewal OR volunteer* OR voluntary OR practical OR regenerat* OR restor* OR maintain* OR care OR enhance* OR preserve OR creat* OR activ* OR action* OR involve*) AND ((natur* NEAR/3 environment*) OR (environmental* AND conservation*)))) AND pd(19900101-20121002)		
S29	ti((((communit* OR local) NEAR/5 (garden* OR park* OR green* OR greenspace OR outdoor* OR outside* OR pavement* OR sidewalk* OR wood* OR allotment* OR lake* OR canal* OR river*)) AND (work* OR renewal OR volunteer* OR voluntary OR practical OR participat* OR regenerat* OR restor* OR maintain* OR enhance OR preserve OR creat*))) OR ab((((communit* OR local) NEAR/5 (garden* OR park* OR green* OR greenspace OR outdoor* OR outside* OR pavement* OR sidewalk* OR wood* OR allotment* OR lake* OR canal* OR river*)) AND (work* OR renewal OR volunteer* OR voluntary OR practical OR participat* OR regenerat* OR restor* OR maintain* OR enhance OR preserve OR creat*))) AND pd(19900101-20121002)	British Education Index	11

(*Continued*)

S30	SU.EXACT.EXPLODE ("Commu-nity") AND SU.EXACT.EX-PLODE("Conservation Edu-cation")	British Education Index	0
S31	s27 or s28 or s29 OR S30	British Education Index	16
S32	S13 OR S16 OR S19 OR S22 OR S26 OR S31	British Education Index	78

Hits: 78
Notes: N/A
File Saved: BEI RIS 78.txt
12.
Database(s): GreenFILE
Host: EBSCOhost
Data Parameters: 1975-Current
Date Searched: Wednesday 3rd October 2012
Searched By: CC
Strategy Checked by: KH, RL and RG
Search Strategy:
S1. TI (((conservation* and natural and environment* and (renewal or volunteer* or voluntary or participate* or practical or regenerate* or restor* or maintain* or care or enhance* or preserve or great* or activ* or action* or involve*)))) OR AB (((conservation* and natural and environment* and (renewal or volunteer* or voluntary or participate* or practical or regenerate* or restor* or maintain* or care or enhance* or preserve or great* or activ* or action* or involve*))))
S2. TI (Conservation N3 interventions) OR AB (Conservation N3 interventions)
S3. TI ((((environmental* N3 (conservation* or volunteer* or steward*)) and (Regenerat* or restore or restoration or redevelop or maintain or enhance or preserve or preserving or create or creation or establish or establishing or founding or build* or cultivat* or cultivation or participate or participation)))) OR AB ((((environmental* N3 (conservation* or volunteer* or steward*)) and (Regenerat* or restore or restoration or redevelop or maintain or enhance or preserve or preserving or create or creation or establish or establishing or founding or build* or cultivat* or cultivation or participate or participation))))
S4. TI ((((conservation* N3 (group* or volunteer* or voluntary or association* or organisation* or organization* or participa* or stakeholder* or steward* or trust or ranger* or activit*)) and (renewal or volunteer* or voluntary or participate* or practical or regenerate* or restor* or maintain* or care or enhance* or preserve or great* or activ* or action* or involve*)))) OR AB ((((conservation* N3 (group* or volunteer* or voluntary or association* or organisation* or organization* or participa* or stakeholder* or steward* or trust or ranger* or activit*)) and (renewal or volunteer* or voluntary or participate* or practical or regenerate* or restor* or maintain* or care or enhance* or preserve or great* or activ* or action* or involve*))))
S5. TI ((((conservation* N5 (nature or rural or countryside or outdoor* or outside or backcountry or hinterland or outback or wood* or park* or parkland or garden* or meadow* or farm* or (farm N1 land) or horticultural or botanical or arboretum or allotment* or forest* or rainforest or moor* or dale* or marsh* or mountain* or beach* or wilderness or landscape* or tree* or copse* or river* or lake* or canal* or waterway or wetland* or (open N1 space*) or (protected N1 area*) or green* or planning* or footpath* or trail* or coast* or cliff* or dune* or (bio N1 diversity) or (eco N1 system) or (protected N1 area*))) and (renewal or volunteer* or voluntary or participate* or practical or regenerate* or restor* or maintain* or care or enhance* or preserve or great* or activ* or action* or involve*)))) OR AB ((((conservation* N5 (nature or rural or countryside or outdoor* or outside or backcountry or hinterland or outback or wood* or park* or parkland or garden* or meadow* or farm* or (farm N1 land) or horticultural or botanical or arboretum or allotment* or forest* or rainforest or moor* or dale* or marsh* or mountain* or beach* or wilderness or landscape* or tree* or copse* or river* or lake* or canal* or waterway or wetland* or (open N1 space*) or (protected N1 area*) or green* or planning* or footpath* or trail* or coast* or cliff* or dune* or (bio N1 diversity) or (eco N1 system) or (protected N1 area*))) and (renewal or volunteer* or voluntary or

participate* or practical or regenerate* or restor* or maintain* or care or enhance* or preserve or great* or activ* or action* or involve*))
))
S6. TI ((activ* or practical or participat*) N3 (conservation*))) OR AB ((activ* or practical or participat*) N3 (conservation*)))
S7. S1 or S2 or S3 or S4 or S5
S8. TI (((((Volunteer* or voluntary) N5 (environment* or nature or rural or countryside or outdoor* or outside or backcountry or hinterland or outback or wood* or park* or parkland or garden* or meadow* or horticultural or botanical or arboretum or allotment* or forest* or rainforest or moor* or dale* or marsh* or mountain* or beach* or wilderness or landscape* or tree* or copse* or river* or lake* or canal* or waterway or wetland* or (open N1 space*) or (protected N1 area*) or green* or planning* or footpath* or trail* or coast* or cliff* or dune* or (bio N1 diversity) or (eco N1 system) or (protected N1 area*))) and (renewal or participate* or practical or regenerate* or restor* or maintain* or care or enhance* or preserve or great* or activ* or action* or involve* or engag*)))) OR (((((Volunteer* or voluntary) N5 (environment* or nature or rural or countryside or outdoor* or outside or backcountry or hinterland or outback or wood* or park* or parkland or garden* or meadow* or horticultural or botanical or arboretum or allotment* or forest* or rainforest or moor* or dale* or marsh* or mountain* or beach* or wilderness or landscape* or tree* or copse* or river* or lake* or canal* or waterway or wetland* or (open N1 space*) or (protected N1 area*) or green* or planning* or footpath* or trail* or coast* or cliff* or dune* or (bio N1 diversity) or (eco N1 system) or (protected N1 area*))) and (renewal or participate* or practical or regenerate* or restor* or maintain* or care or enhance* or preserve or great* or activ* or action* or involve* or engag*))))
S9. (((voluntary or volunteer*) N5 (group* or association or stakeholder* or steward* or ranger*)) and (environment* or nature or rural or countryside or outdoor* or outside or backcountry or hinterland or outback or wood* or park* or parkland or garden* or meadow* or horticultural or botanical or arboretum or allotment* or forest* or rainforest or moor* or dale* or marsh* or mountain* or beach* or wilderness or landscape* or tree* or copse* or river* or lake* or canal* or waterway or wetland* or (open N1 space*) or (protected N1 area*) or green* or planning* or footpath* or trail* or coast* or cliff* or dune* or (bio N1 diversity) or (eco N1 system) or (protected N1 area*)))
S10. S8 OR S9
S11. TI (((Green* N3 (space* or gym or exercise or volunteer* or voluntary or conservation or infrastructure or care or streets or communal or Guerrilla)))) OR AB (((Green* N3 (space* or gym or exercise or volunteer* or voluntary or conservation or infrastructure or care or streets or communal or Guerrilla))))
S12. TI (greenspace) OR AB (greenspace)
S13. S11 OR S12
S14. TI ((((urban N3 (green* or park* or parkland or garden* or horticultur* or wood* or forest* or botanical or arboretum or allotment* or (open N1 space))) and (renewal or participate* or practical or regenerate* or restor* or maintain* or care or enhance* or preserve or great* or activ* or action* or involve* or engag*)))) OR AB ((((urban N3 (green* or park* or parkland or garden* or horticultur* or wood* or forest* or botanical or arboretum or allotment* or (open N1 space))) and (renewal or participate* or practical or regenerate* or restor* or maintain* or care or enhance* or preserve or great* or activ* or action* or involve* or engag*))))
S15. TI ((((garden* or horticulture or allotment* or botanical or arboretum) N5 (kitchen or school* or college* or university or campus or hospital* or prison* or penitentiary or institution or urban or green* or communit* or communal or group* or guerrilla or (bio N1 diver*) or eco or ((grow or pick) N3 your own))))) OR AB ((((garden* or horticulture or allotment* or botanical or arboretum) N5 (kitchen or school* or college* or university or campus or hospital* or prison* or penitentiary or institution or urban or green* or communit* or communal or group* or guerrilla or (bio N1 diver*) or eco or ((grow or pick) N3 your own)))))
S16. TI ((((garden* or horticulture or allotment* or botanical or arboretum) N5 (maintain* or creat* or culivat* or enhance* or preserve or voluntary or volunteer or conservation* or participat*)))) OR AB ((((garden* or horticulture or allotment* or botanical or arboretum) N5 (maintain* or creat* or culivat* or enhance* or preserve or voluntary or volunteer or conservation* or participat*)))
)
S17. S14 OR S15 OR S16
S18. TI ((((communit* N5 (group* or team* or association* or organisation or organization or participa* or stakeholder* or steward* or trust* or ranger* or activit*)) and (garden* or allotment* or forest or (natural and environment) or conservation*)))) OR AB ((((communit* N5 (group* or team* or association* or organisation or organization or participa* or stakeholder* or steward* or trust* or ranger* or activit*)) and (garden* or allotment* or forest or (natural and environment) or conservation*))))
S19. TI (((communit* and (work* or renewal or volunteer* or voluntary or practical or regenerat* or restor* or maintain* or care or enhance* or preserve or creat* or activ* or action* or involve*) and ((natur* N3 environment*) or (environmental* and conservation*)))
)) OR AB (((communit* and (work* or renewal or volunteer* or voluntary or practical or regenerat* or restor* or maintain* or care or enhance* or preserve or creat* or activ* or action* or involve*) and ((natur* N3 environment*) or (environmental* and conservation*)))
))

S20. TI (((((communit* or local) N5 (garden* or park* or green* or greenspace or outdoor* or outside* or pavement* or sidewalk* or wood* or allotment* or lake* or canal* or river*)) and (work* or renewal or volunteer* or voluntary or practical or participat* or regenerat* or restor* or maintain* or enhance or preserve or creat*)))) OR AB (((((communit* or local) N5 (garden* or park* or green* or greenspace or outdoor* or outside* or pavement* or sidewalk* or wood* or allotment* or lake* or canal* or river*)) and (work* or renewal or volunteer* or voluntary or practical or participat* or regenerat* or restor* or maintain* or enhance or preserve or creat*))))
S21. S18 OR S19 OR S20
S22. S7 or S10 or S13 or S17 or S21
S23. TI ((Health* or (quality N3 life) or (well N3 being) or wellbeing or emotion*)) OR AB ((Health* or (quality N3 life) or (well N3 being) or wellbeing or emotion*))
S24. S22 and S23
S25. TI (((clinical or surgery or surgical or cell or cells or laboratory or placebo or bladder or uterus or breast or gene or genes or genetic or bowel or liver or enzymes or viral or lymph or molecular))) OR AB (((clinical or surgery or surgical or cell or cells or laboratory or placebo or bladder or uterus or breast or gene or genes or genetic or bowel or liver or enzymes or viral or lymph or molecular)))
S26. S24 NOT S25
Hits: 575
Notes: Line S6 recorded a nil result and so could not be incorporated with the other lines at S7. EBSCOhost prohibits this action.
File Saved: GreenFILE RIS 78.txt
13.
Database(s): SPORTDiscus
Host: EBSCOhost
Data Parameters: 1892-2012
Date Searched: Wednesday 3rd October 2012
Searched By: CC
Strategy Checked by: KH, RL and RG
Search Strategy:
S1. TI (((conservation* and natural and environment* and (renewal or volunteer* or voluntary or participate* or practical or regenerate* or restor* or maintain* or care or enhance* or preserve or great* or activ* or action* or involve*)))) OR AB (((conservation* and natural and environment* and (renewal or volunteer* or voluntary or participate* or practical or regenerate* or restor* or maintain* or care or enhance* or preserve or great* or activ* or action* or involve*))))
S2. TI ((((environmental* N3 (conservation* or volunteer* or steward*)) and (Regenerat* or restore or restoration or redevelop or maintain or enhance or preserve or preserving or create or creation or establish or establishing or founding or build* or cultivat* or cultivation or participate or participation)))) OR AB ((((environmental* N3 (conservation* or volunteer* or steward*)) and (Regenerat* or restore or restoration or redevelop or maintain or enhance or preserve or preserving or create or creation or establish or establishing or founding or build* or cultivat* or cultivation or participate or participation))))
S3. TI ((((conservation* N3 (group* or volunteer* or voluntary or association* or organisation* or organization* or participa* or stakeholder* or steward* or trust or ranger* or activit*)) and (renewal or volunteer* or voluntary or participate* or practical or regenerate* or restor* or maintain* or care or enhance* or preserve or great* or activ* or action* or involve*)))) OR AB ((((conservation* N3 (group* or volunteer* or voluntary or association* or organisation* or organization* or participa* or stakeholder* or steward* or trust or ranger* or activit*)) and (renewal or volunteer* or voluntary or participate* or practical or regenerate* or restor* or maintain* or care or enhance* or preserve or great* or activ* or action* or involve*))))
S4. TI ((((conservation* N5 (nature or rural or countryside or outdoor* or outside or backcountry or hinterland or outback or wood* or park* or parkland or garden* or meadow* or farm* or (farm N1 land) or horticultural or botanical or arboretum or allotment* or forest* or rainforest or moor* or dale* or marsh* or mountain* or beach* or wilderness or landscape* or tree* or copse* or river* or lake* or canal* or waterway or wetland* or (open N1 space*) or (protected N1 area*) or green* or planning* or footpath* or trail* or coast* or cliff* or dune* or (bio N1 diversity) or (eco N1 system) or (protected N1 area*))) and (renewal or volunteer* or voluntary or participate* or practical or regenerate* or restor* or maintain* or care or enhance* or preserve or great* or activ* or action* or involve*)))) OR AB ((((conservation* N5 (nature or rural or countryside or outdoor* or outside or backcountry or hinterland or outback or wood* or park* or parkland or garden* or meadow* or farm* or (farm N1 land) or horticultural or botanical or arboretum or allotment* or forest* or rainforest or moor* or dale* or marsh* or mountain* or beach* or wilderness or landscape* or tree* or copse* or river* or lake* or canal* or waterway or wetland* or (open N1 space*) or (protected N1 area*) or green* or planning* or footpath* or trail* or coast* or cliff* or dune* or (bio N1 diversity) or (eco N1 system) or (protected N1 area*))) and (renewal or volunteer* or voluntary or

participate* or practical or regenerate* or restor* or maintain* or care or enhance* or preserve or great* or activ* or action* or involve*))
))
S5. S1 or S2 or S3 or S4
S6. TI (((((Volunteer* or voluntary) N5 (environment* or nature or rural or countryside or outdoor* or outside or backcountry or hinterland or outback or wood* or park* or parkland or garden* or meadow* or horticultural or botanical or arboretum or allotment* or forest* or rainforest or moor* or dale* or marsh* or mountain* or beach* or wilderness or landscape* or tree* or copse* or river* or lake* or canal* or waterway or wetland* or (open N1 space*) or (protected N1 area*) or green* or planning* or footpath* or trail* or coast* or cliff* or dune* or (bio N1 diversity) or (eco N1 system) or (protected N1 area*))) and (renewal or participate* or practical or regenerate* or restor* or maintain* or care or enhance* or preserve or great* or activ* or action* or involve* or engag*)))) OR (((((Volunteer* or voluntary) N5 (environment* or nature or rural or countryside or outdoor* or outside or backcountry or hinterland or outback or wood* or park* or parkland or garden* or meadow* or horticultural or botanical or arboretum or allotment* or forest* or rainforest or moor* or dale* or marsh* or mountain* or beach* or wilderness or landscape* or tree* or copse* or river* or lake* or canal* or waterway or wetland* or (open N1 space*) or (protected N1 area*) or green* or planning* or footpath* or trail* or coast* or cliff* or dune* or (bio N1 diversity) or (eco N1 system) or (protected N1 area*))) and (renewal or participate* or practical or regenerate* or restor* or maintain* or care or enhance* or preserve or great* or activ* or action* or involve* or engag*))))
S7. (((voluntary or volunteer*) N5 (group* or association or stakeholder* or steward* or ranger*)) and (environment* or nature or rural or countryside or outdoor* or outside or backcountry or hinterland or outback or wood* or park* or parkland or garden* or meadow* or horticultural or botanical or arboretum or allotment* or forest* or rainforest or moor* or dale* or marsh* or mountain* or beach* or wilderness or landscape* or tree* or copse* or river* or lake* or canal* or waterway or wetland* or (open N1 space*) or (protected N1 area*) or green* or planning* or footpath* or trail* or coast* or cliff* or dune* or (bio N1 diversity) or (eco N1 system) or (protected N1 area*)))
S8. S6 OR S7
S9. TI (((Green* N3 (space* or gym or exercise or volunteer* or voluntary or conservation or infrastructure or care or streets or communal or Guerrilla)))) OR AB (((Green* N3 (space* or gym or exercise or volunteer* or voluntary or conservation or infrastructure or care or streets or communal or Guerrilla))))
S10. TI (greenspace) OR AB (greenspace)
S11. S9 OR S10
S12. TI ((((urban N3 (green* or park* or parkland or garden* or horticultur* or wood* or forest* or botanical or arboretum or allotment* or (open N1 space))) and (renewal or participate* or practical or regenerate* or restor* or maintain* or care or enhance* or preserve or great* or activ* or action* or involve* or engag*)))) OR AB ((((urban N3 (green* or park* or parkland or garden* or horticultur* or wood* or forest* or botanical or arboretum or allotment* or (open N1 space))) and (renewal or participate* or practical or regenerate* or restor* or maintain* or care or enhance* or preserve or great* or activ* or action* or involve* or engag*))))
S13. TI ((((garden* or horticulture or allotment* or botanical or arboretum) N5 (kitchen or school* or college* or university or campus or hospital* or prison* or penitentiary or institution or urban or green* or communit* or communal or group* or guerrilla or (bio N1 diver*) or eco or ((grow or pick) N3 your own))))) OR AB ((((garden* or horticulture or allotment* or botanical or arboretum) N5 (kitchen or school* or college* or university or campus or hospital* or prison* or penitentiary or institution or urban or green* or communit* or communal or group* or guerrilla or (bio N1 diver*) or eco or ((grow or pick) N3 your own)))))
S14. TI ((((garden* or horticulture or allotment* or botanical or arboretum) N5 (maintain* or creat* or culivat* or enhance* or preserve or voluntary or volunteer or conservation* or participat*)))) OR AB ((((garden* or horticulture or allotment* or botanical or arboretum) N5 (maintain* or creat* or culivat* or enhance* or preserve or voluntary or volunteer or conservation* or participat*)))
S15. TI ((((communit* N5 (group* or team* or association* or organisation or organization or participa* or stakeholder* or steward* or trust* or ranger* or activit*)) and (garden* or allotment* or forest or (natural and environment) or conservation*)))) OR AB ((((communit* N5 (group* or team* or association* or organisation or organization or participa* or stakeholder* or steward* or trust* or ranger* or activit*)) and (garden* or allotment* or forest or (natural and environment) or conservation*))))
S16. TI (((communit* and (work* or renewal or volunteer* or voluntary or practical or regenerat* or restor* or maintain* or care or enhance* or preserve or creat* or activ* or action* or involve*) and ((natur* N3 environment*) or (environmental* and conservation*)))
)) OR AB (((communit* and (work* or renewal or volunteer* or voluntary or practical or regenerat* or restor* or maintain* or care or enhance* or preserve or creat* or activ* or action* or involve*) and ((natur* N3 environment*) or (environmental* and conservation*)))
))
S17. TI (((((communit* or local) N5 (garden* or park* or green* or greenspace or outdoor* or outside* or pavement* or sidewalk* or wood* or allotment* or lake* or canal* or river*)) and (work* or renewal or volunteer* or voluntary or practical or participat* or regenerat* or restor* or maintain* or enhance or preserve or creat*)))) OR AB (((((communit* or local) N5 (garden* or park* or green* or greenspace or outdoor* or outside* or pavement* or sidewalk* or wood* or allotment* or lake* or canal* or river*)) and

(work* or renewal or volunteer* or voluntary or practical or participat* or regenerat* or restor* or maintain* or enhance or preserve or creat*))))
S18. S12 OR S13 OR S14 OR S15 OR S16 OR S17
S19. TI ((clinical or surgery or surgical or cell or cells or laboratory or placebo or bladder or uterus or breast or gene or genes or genetic or bowel or liver or enzymes or viral or lymph or molecular)) OR AB ((clinical or surgery or surgical or cell or cells or laboratory or placebo or bladder or uterus or breast or gene or genes or genetic or bowel or liver or enzymes or viral or lymph or molecular))
S20. S18 NOT S19
S21. Limiters - Published Date: 19900101-20121231; Language: English
Hits: 814
Notes: N/A
File Saved: Sports RIS 3896.txt
14.
Database(s): BIOSIS
Host: ISI
Data Parameters: 1969-2012
Date Searched: 1st October 2012
Searched By: Cooper
Strategy Checked by: KH, RL and RG
Search Strategy:

1. Topic=((“environmental conservation”)) AND Major Concepts=(conservation) AND Taxa Notes=(Humans)
2. Topic=((Conservation NEAR/3 interventions)) AND Major Concepts=((conservation)) AND Taxa Notes=(Humans)
3. Topic=((environment* NEAR/5 (stewardship or volunteer* or voluntary))) AND Major Concepts=(conservation) AND Taxa Notes=(Humans)
4. Topic=(((((((conservation* NEAR/3 (group* or volunteer* or voluntary or association* or organisation* or organization* or participa* or stakeholder* or steward* or trust or ranger*)) AND (nature or rural or countryside or outdoor* or outside or backcountry or hinterland or outback or wood* or park* or garden* or meadow* or farm* or (farm NEAR/1 land) or horticultural or botanical or arboretum* or allotment* or forest* or rainforest* or moor* or dale*1 or marsh* or mountain* or beach* or wilderness or landscape* or tree* or copse* or river* or lake* or canal* or waterway* or wetland* or (open NEAR/1 space*) or (protected NEAR/1 area*) or green* or planning* or footpath* or trail* or coast* or cliff* or dune* or (bio NEAR/1 diversity) or (eco NEAR/1 system))))))) AND Major Concepts=((conservation)) AND Taxa Notes=(Humans)
5. Topic=((((((activ* or practical) NEAR/3 conservation*)))))) AND Major Concepts=(conservation) AND Taxa Notes=(Humans)
6. Topic=((((nature NEAR/3 (work* or renewal or volunteer* or voluntary or practical or regenerat* or restor* or maintain* or care or enhanc* or preserve or creat*)))))) AND Major Concepts=(conservation) AND Taxa Notes=(Humans)
7. #6 OR #5 OR #4 OR #3 OR #2 OR #1
8. Topic=((((Volunteer* or voluntary) NEAR/5 (environment* or nature or rural or countryside or outdoor* or outside or backcountry or hinterland or outback or wood* or park* or garden* or meadow* or farm* or (farm NEAR/1 land) or horticultural or botanical or arboretum or allotment* or forest* or rainforest or moor* or dale*1 or marsh* or mountain* or beach* or wilderness or landscape* or tree* or copse* or river* or lake* or canal* or waterway or wetland* or (open NEAR/1 space*) or (protected NEAR/1 area*) or green* or planning* or footpath or trail* or coast* or cliff* or dune* or (bio NEAR/1 diversity) or (eco NEAR/1 system))))) AND Major Concepts=(conservation) AND Taxa Notes=(Humans)AND Taxa Notes=(Humans)
9. Topic=(((Green* NEAR/3 (space* or gym or exercise or volunteer* or voluntary or conservation* or infrastructure or care or streets or communal or guerrilla)))) AND Taxa Notes=(Humans)
10. Topic=((greenspace*)) AND Taxa Notes=(Humans)
11. #10 OR #9
12. Topic=((urban NEAR/3 (green* or park* or garden* or horticultur* or wood* or forest* or botanical or arboretum or allotment* or (open NEAR/1 space)))) AND Topic=((Regenerat* or restore or restoration or redevelop or maintain or enhance or preserve or preserving or create or creation or establish or establishing or founding or build* or cultivat* or cultivation or participate or participation)) AND Taxa Notes=(Humans)
13. Topic=((urban or city or cities or metropolis or town*) and (garden* or park* or allotment*) and (Regenerat* or restore or restoration or redevelop or maintain or enhance or preserve or preserving or create or creation or establish or establishing or founding or build* or cultivat* or cultivation or participate or participation)) AND Taxa Notes=(Humans)
14. Topic=(((((garden* or horticulture or allotment* or botanical or arboretum) NEAR/5 (kitchen or school* or college* or university or campus or hospital* or prison* or penitentiary or institution or communit* or communal or group* or guerrilla or (bio

NEAR/1 diver*))))))) AND Topic=(((work* or renewal or volunteer* or voluntary or practical or regenerat* or restor* or maintain* or care or enhanc* or preserve or creat*))) AND Taxa Notes=(Humans)
15. Topic=((communit*) and (work* or renewal or volunteer* or voluntary or practical or regenerat* or restor* or maintain* or care or enhanc* or preserve or creat* or activ* or action* or involve*)) AND Topic=(((natur* NEAR/3 environment*) or ("environmental* conservation*"))) AND Taxa Notes=(Humans)
16. (((communit*) NEAR/5 (garden* or park* or green* or greenspace or outdoor* or outside* or pavement* or sidewalk* or wood* or allotment* or lake* or canal* or river* or space*))) AND Topic=((work* or renewal or volunteer* or voluntary or practical or regenerat* or restor* or maintain* or enhanc* or preserve or creat*)) AND Taxa Notes=(Humans)
17. (((local) NEAR/5 (garden* or park* or green* or greenspace or outdoor* or outside* or pavement* or sidewalk* or wood* or allotment* or lake* or canal* or river* or space*))) AND Topic=((work* or renewal or volunteer* or voluntary or practical or regenerat* or restor* or maintain* or enhanc* or preserve or creat*)) AND Taxa Notes=(Humans)
18. #17 OR #16 OR #15 OR #14 OR #13 OR #12
19. #18 OR #11 OR #8 OR #7
20. Topic=((clinical or surgery or surgical or cell or cells or laboratory or placebo or bladder or uterus or breast or gene or genes or genetic or bowel or liver or enzymes or viral or lymph or molecular))
21. #19 NOT #20
22. #19 NOT #20 Refined by: Languages=(ENGLISH)
Hits: 1063
Notes: Lemmatization=Off
File Saved: biosis ris.txt
15.
Database(s): ERIC
Host: ProQuest
Data Parameters:
Date Searched: Wednesday 3rd October 2012
Searched By: CC
Strategy Checked by: KH, RL and RG
Search Strategy:

Set#	Searched for	Databases	Results
S1	(ti ((((conservation* AND natural AND environment* AND (renewal OR volunteer* OR voluntary OR participate* OR practical OR regenerate* OR restor* OR maintain* OR care OR enhance* OR preserve OR great* OR activ* OR action* OR involve*))))) OR ab((((conservation* AND natural AND environment* AND (renewal OR volunteer* OR voluntary OR participate* OR practical OR regenerate* OR restor* OR maintain* OR care OR enhance* OR preserve OR great* OR activ* OR ac-	ERIC	70

(*Continued*)

	tion* OR involve*)))))) AND la.exact("English") AND pd (19900101-20121002)		
S2	(ti((((Conservation NEAR/3 inter- ventions)))) OR ab((((Conservation NEAR/3 interventions))))) AND la.exact("English") AND pd(19900101-20121002)	ERIC	3
S3	(ti(((((environmental* NEAR/3 (conservation* OR volunteer* OR steward*)) AND (Regenerat* OR restore OR restoration OR redevelop OR maintain OR enhance OR preserve OR preserving OR create OR creation OR establish OR establishing OR founding OR build* OR cultivat* OR cultivation OR participate OR participation))))) OR ab(((((environmental* NEAR/3 (conservation* OR volunteer* OR steward*)) AND (Regenerat* OR restore OR restoration OR redevelop OR maintain OR enhance OR preserve OR preserving OR create OR creation OR establish OR establishing OR founding OR build* OR cultivat* OR cultivation OR participate OR participation)))))) AND la.exact("English") AND pd(19900101-20121002)	ERIC	86
S4	(ti((((conservation* NEAR/3 (group* OR volunteer* OR voluntary OR association* OR organisation* OR organization* OR participa* OR stakeholder* OR steward* OR trust OR ranger* OR activit*))))) OR ab((((conservation* NEAR/3 (group*	ERIC	121

(*Continued*)

	OR volunteer* OR voluntary OR association* OR organisation* OR organization* OR participa* OR stakeholder* OR steward* OR trust OR ranger* OR activit*)))))) AND la.exact("English") AND pd(19900101-20121002)		
S5	(ti(((((conservation* NEAR/5 (nature OR rural OR countryside OR outdoor* OR outside OR backcountry OR hinterland OR outback OR wood* OR park* OR parkland OR garden* OR meadow* OR farm* OR (farm NEAR/1 land) OR horticultural OR floricultural OR botanical OR arboretum OR allotment* OR forest* OR rainforest OR moor* OR dale* OR marsh* OR mountain* OR beach* OR wilderness OR landscape* OR tree* OR copse* OR river* OR lake* OR canal* OR waterway OR wetland* OR (open NEAR/1 space*) OR (protected NEAR/1 area*) OR green* OR planning* OR footpath* OR trail* OR coast* OR cliff* OR dune* OR (bio NEAR/1 diversity) OR (eco NEAR/1 system) OR (protected NEAR/1 area*))))))) OR ab(((((conservation* NEAR/5 (nature OR rural OR countryside OR outdoor* OR outside OR backcountry OR hinterland OR outback OR wood* OR park* OR parkland OR garden* OR meadow* OR farm* OR (farm NEAR/1 land) OR horticultural OR floricultural OR botanical OR arboretum OR allot-	ERIC	223

(*Continued*)

	ment* OR forest* OR rainforest OR moor* OR dale* OR marsh* OR mountain* OR beach* OR wilderness OR landscape* OR tree* OR copse* OR river* OR lake* OR canal* OR waterway OR wetland* OR (open NEAR/1 space*) OR (protected NEAR/1 area*) OR green* OR planning* OR footpath* OR trail* OR coast* OR cliff* OR dune* OR (bio NEAR/1 diversity) OR (eco NEAR/1 system) OR (protected NEAR/1 area*)))))))) AND la.exact("English") AND pd (19900101-20121002)		
S6	(ti((geo NEAR/3 conservation)) OR ab((geo NEAR/3 conservation))) AND la.exact("English") AND pd (19900101-20121002)	ERIC	0
S7	SU.EXACT.EXPLODE("Conservation Education") AND la.exact("English") AND pd(19900101-20121002)	ERIC	394
S8	(ti(((((nature OR rural OR countryside OR outdoor* OR outside OR backcountry OR hinterland OR outback OR wood* OR park* OR parkland OR garden* OR meadow* OR farm* OR (farm NEAR/1 land) OR horticultural OR floricultural OR botanical OR arboretum OR allotment* OR forest* OR rainforest OR moor* OR dale* OR marsh* OR mountain* OR beach* OR wilderness OR landscape* OR tree* OR copse* OR river* OR lake* OR canal* OR waterway OR wetland* OR	ERIC	98926

(*Continued*)

	(open NEAR/1 space*) OR (protected NEAR/1 area*) OR green* OR planning* OR footpath* OR trail* OR coast* OR cliff* OR dune* OR (bio NEAR/1 diversity) OR (eco NEAR/1 system) OR (protected NEAR/1 area*)))))) OR ab(((((nature OR rural OR countryside OR outdoor* OR outside OR backcountry OR hinterland OR outback OR wood* OR park* OR parkland OR garden* OR meadow* OR farm* OR (farm NEAR/1 land) OR horticultural OR floricultural OR botanical OR arboretum OR allotment* OR forest* OR rainforest OR moor* OR dale* OR marsh* OR mountain* OR beach* OR wilderness OR landscape* OR tree* OR copse* OR river* OR lake* OR canal* OR waterway OR wetland* OR (open NEAR/1 space*) OR (protected NEAR/1 area*) OR green* OR planning* OR footpath* OR trail* OR coast* OR cliff* OR dune* OR (bio NEAR/1 diversity) OR (eco NEAR/1 system) OR (protected NEAR/1 area*))))))) AND la.exact("English") AND pd (19900101-20121002)		
S9	S7 and S8	ERIC	210
S11	(ti((volunteer* OR voluntary)) OR ab((volunteer* OR voluntary))) AND la.exact("English") AND pd(19900101-20121002)	ERIC	8238
S12	S8 and S11	ERIC	13
S13	S9 or S12	ERIC	214

(*Continued*)

S14	S1 OR S2 OR S3 OR S4 OR S5 OR S6 OR S13	ERIC	605
S15	(ti((((((Volunteer* OR voluntary) NEAR/5 (environment* OR nature OR rural OR countryside OR outdoor* OR outside OR backcountry OR hinterland OR outback OR wood* OR park* OR parkland OR garden* OR meadow* OR horticultural OR floricultural OR botanical OR arboretum OR allotment* OR forest* OR moor* OR dale* OR marsh* OR mountain* OR beach* OR wilderness OR landscape* OR tree* OR copse* OR river* OR lake* OR canal* OR waterway OR wetland* OR (open NEAR/1 space*) OR green* OR planning* OR footpath OR trail OR (bio NEAR/1 diversity))))))) OR ab((((((Volunteer* OR voluntary) NEAR/5 (environment* OR nature OR rural OR countryside OR outdoor* OR outside OR backcountry OR hinterland OR outback OR wood* OR park* OR parkland OR garden* OR meadow* OR horticultural OR floricultural OR botanical OR arboretum OR allotment* OR forest* OR moor* OR dale* OR marsh* OR mountain* OR beach* OR wilderness OR landscape* OR tree* OR copse* OR river* OR lake* OR canal* OR waterway OR wetland* OR (open NEAR/1 space*) OR green* OR planning* OR footpath OR trail OR (bio NEAR/1 diversity))))))) AND la.exact("En-	ERIC	320

(*Continued*)

	glish") AND pd(19900101-20121002)		
S16	(ti(((((((voluntary OR volunteer*) NEAR/5 (group* OR association OR stakeholder* OR steward* OR ranger*)) AND (environment* OR nature OR rural OR outdoor* OR outside OR (open NEAR/1 space*) OR conservation* OR wood* OR park* OR parkland OR garden* OR backcountry OR hinterland OR horticultural OR allotment* OR landscape OR scenic OR Botanical OR Arboretum OR forest* OR moor OR dale OR marsh* OR mountain* OR beach* OR wilderness OR wild OR tree* OR river* OR lake* OR canal* OR water OR waterway OR wetland* OR (open NEAR/1 space*) OR green* OR footpath OR trail)))))) OR ab (((((((voluntary OR volunteer*) NEAR/5 (group* OR association OR stakeholder* OR steward* OR ranger*)) AND (environment* OR nature OR rural OR outdoor* OR outside OR (open NEAR/1 space*) OR conservation* OR wood* OR park* OR parkland OR garden* OR backcountry OR hinterland OR horticultural OR allotment* OR landscape OR scenic OR Botanical OR Arboretum OR forest* OR moor OR dale OR marsh* OR mountain* OR beach* OR wilderness OR wild OR tree* OR river* OR lake* OR canal* OR water OR waterway OR wetland*	ERIC	134

(*Continued*)

	OR (open NEAR/1 space*) OR green* OR footpath OR trail))))))) AND la.exact("English") AND pd(19900101-20121002)		
S17	S15 or S16	ERIC	432
S18	(ti (((((Green* NEAR/3 (space* OR gym OR exercise OR volunteer* OR voluntary OR conservation OR infrastructure OR care OR streets OR communal OR Guerrilla)))))) OR ab(((((Green* NEAR/3 (space* OR gym OR exercise OR volunteer* OR voluntary OR conservation OR infrastructure OR care OR streets OR communal OR Guerrilla))))))) AND la.exact("English") AND pd(19900101-20121002)	ERIC	66
S19	(ti((greenspace)) OR ab((greenspace))) AND la.exact("English") AND pd (19900101-20121002)	ERIC	2
S20	S18 or S19	ERIC	68
S21	(ti((((((work* OR renewal OR volunteer* OR voluntary OR practical OR regenerat* OR restor* OR maintain* OR care OR enhance OR preserve OR creat*) AND (urban OR city OR metropolis OR town*) AND (garden* OR park* OR parkland OR allotment*)))))) OR ab ((((((work* OR renewal OR volunteer* OR voluntary OR practical OR regenerat* OR restor* OR maintain* OR care OR enhance OR preserve OR creat*) AND (urban OR city OR metropo-	ERIC	242

(*Continued*)

	lis OR town*) AND (garden* OR park* OR parkland OR allotment*))))))) AND la.exact("English") AND pd (19900101-20121002)		
S22	(ti(((urban NEAR/3 (green* OR park* OR parkland OR garden* OR horticultur* OR wood* OR forest* OR botanical OR arboretum OR allotment* OR (open NEAR/1 space))))) OR ab(((urban NEAR/3 (green* OR park* OR parkland OR garden* OR horticultur* OR wood* OR forest* OR botanical OR arboretum OR allotment* OR (open NEAR/1 space)))))) AND la.exact("English") AND pd (19900101-20121002)	ERIC	72
S23	S21 or S22	ERIC	298
S24	(ti((((((garden* OR horticulture OR allotment* OR botanical OR arboretum) NEAR/5 (maintain* OR creat* OR culivat* OR enhance* OR preserve OR voluntary OR volunteer OR conservation* OR participat*)))))) OR ab((((((garden* OR horticulture OR allotment* OR botanical OR arboretum) NEAR/5 (maintain* OR creat* OR culivat* OR enhance* OR preserve OR voluntary OR volunteer OR conservation* OR participat*))))))) AND la.exact("English") AND pd (19900101-20121002)	ERIC	112
S25	(ti(((garden* OR horticulture OR allotment* OR botanical OR arboretum) NEAR/5 (kitchen OR school* OR college* OR university OR	ERIC	332

(*Continued*)

	campus OR hospital* OR prison* OR penitentiary OR institution OR urban OR green* OR communit* OR communal OR group* OR guerrilla OR (bio NEAR/1 diver*) OR eco))) OR ab (((garden* OR horticulture OR allotment* OR botanical OR arboretum) NEAR/5 (kitchen OR school* OR college* OR university OR campus OR hospital* OR prison* OR penitentiary OR institution OR urban OR green* OR communit* OR communal OR group* OR guerrilla OR (bio NEAR/1 diver*) OR eco)))) AND la.exact("English") AND pd(19900101-20121002)		
S26	SU.EXACT.EXPLODE ("Gardens") AND SU.EXACT.EXPLODE("Conservation Education") AND la.exact("English") AND pd(19900101-20121002)	ERIC	1
S27	((ti((((((garden* OR horticulture OR allotment* OR botanical OR arboretum) NEAR/5 (maintain* OR creat* OR culivat* OR enhance* OR preserve OR voluntary OR volunteer OR conservation* OR participat*)))))) OR ab((((((garden* OR horticulture OR allotment* OR botanical OR arboretum) NEAR/5 (maintain* OR creat* OR culivat* OR enhance* OR preserve OR voluntary OR volunteer OR conservation* OR participat*))))))) AND la.exact("English") AND pd (19900101-20121002)) OR	ERIC	395

(*Continued*)

	((ti(((garden* OR horticulture OR allotment* OR botanical OR arboretum) NEAR/5 (kitchen OR school* OR college* OR university OR campus OR hospital* OR prison* OR penitentiary OR institution OR urban OR green* OR communit* OR communal OR group* OR guerrilla OR (bio NEAR/1 diver*) OR eco))) OR ab(((garden* OR horticulture OR allotment* OR botanical OR arboretum) NEAR/5 (kitchen OR school* OR college* OR university OR campus OR hospital* OR prison* OR penitentiary OR institution OR urban OR green* OR communit* OR communal OR group* OR guerrilla OR (bio NEAR/1 diver*) OR eco)))) AND la.exact("English") AND pd(19900101-20121002)) OR (SU.EXACT.EXPLODE("Gardens") AND SU.EXACT.EXPLODE("Conservation Education") AND la.exact("English") AND pd(19900101-20121002))		
S28	ti(((((kitchen OR school* OR college* OR university OR campus OR hospital* OR prison* OR penitentiary OR institution OR urban OR green* OR community* OR communal OR group* OR guerrilla OR (bio NEAR/1 diver*) OR eco OR maintain* OR great* OR cultivate* OR voluntary OR volunteer OR conservation* OR participate*))))) AND ab(((((kitchen OR school* OR college* OR university OR	ERIC	131821

(*Continued*)

	campus OR hospital* OR prison* OR penitentiary OR institution OR urban OR green* OR community* OR communal OR group* OR guerrilla OR (bio NEAR/1 diver*) OR eco OR maintain* OR great* OR cultivate* OR voluntary OR volunteer OR conservation* OR participate*))))) AND la.exact("English") AND pd (19900101-20121002)		
S29	SU.EXACT.EXPLODE("Gardens") AND la.exact("English") AND pd (19900101-20121002)	ERIC	74
S30	S28 and S29	ERIC	17
S31	S24 or S25 or S26 or S27 or S30	ERIC	400
S32	(ti((((((communit* NEAR/5 (group* OR team* OR association* OR organisation OR organization OR participa* OR stakeholder* OR steward* OR trust* OR ranger* OR activit*)) AND (garden* OR allotment* OR forest OR (natural AND environment) OR conservation*)))))) OR ab((((((communit* NEAR/5 (group* OR team* OR association* OR organisation OR organization OR participa* OR stakeholder* OR steward* OR trust* OR ranger* OR activit*)) AND (garden* OR allotment* OR forest OR (natural AND environment) OR conservation*)))))) AND la.exact("English") AND pd (19900101-20121002)	ERIC	181

(*Continued*)

S33	(ti(((((communit* AND (work* OR renewal OR volunteer* OR voluntary OR practical OR regenerat* OR restor* OR maintain* OR care OR enhance* OR preserve OR creat* OR activ* OR action* OR involve*) AND ((natur* NEAR/3 environment*) OR (environmental* AND conservation*))))))) OR ab(((((communit* AND (work* OR renewal OR volunteer* OR voluntary OR practical OR regenerat* OR restor* OR maintain* OR care OR enhance* OR preserve OR creat* OR activ* OR action* OR involve*) AND ((natur* NEAR/3 environment*) OR (environmental* AND conservation*)))))))) AND la.exact("English") AND pd(19900101-20121002)	ERIC	246
S34	(ti(((((((communit* OR local) NEAR/5 (garden* OR park* OR green* OR greenspace OR outdoor* OR outside* OR pavement* OR sidewalk* OR wood* OR allotment* OR lake* OR canal* OR river*)) AND (work* OR renewal OR volunteer* OR voluntary OR practical OR participat* OR regenerat* OR restor* OR maintain* OR enhance OR preserve OR creat*)))))) OR ab(((((((communit* OR local) NEAR/5 (garden* OR park* OR green* OR greenspace OR outdoor* OR outside* OR pavement* OR sidewalk* OR wood* OR allotment* OR lake* OR canal* OR river*)) AND (work*	ERIC	678

(*Continued*)

	OR renewal OR volunteer* OR voluntary OR practical OR participat* OR regenerat* OR restor* OR maintain* OR enhance OR preserve OR creat*))))))) AND la.exact("English") AND pd (19900101-20121002)		
S35	SU.EXACT.EXPLODE ("Community") AND SU.EXACT.EXPLODE("Conservation Education") AND la.exact("English") AND pd(19900101-20121002)	ERIC	2
S36	S32 or S33 or S34 or S35	ERIC	1027
S37	S14 or S17 or S20 or S23 or S31 or S36	ERIC	2502
S38	(ti(((Health* OR (quality NEAR/3 life) OR (well NEAR/3 being) OR wellbeing OR emotion*))) OR ab(((Health* OR (quality NEAR/3 life) OR (well NEAR/3 being) OR wellbeing OR emotion*)))) AND la.exact("English") AND pd(19900101-20121002)	ERIC	63778
S39	S37 and S38	ERIC	363

Hits: 363
Notes: N/A
File Saved: ERIC RIS 363.txt
Database(s): ASSIA
Host: ProQuest
Data Parameters: 1986-2012
Date Searched: 1st October 2012
Searched By: Cooper
Strategy Checked by: KH, RL and RG
Search Strategy:

Set#	Searched for	Databases	Results
S1	(ti(((conservation* AND natu- ral AND environment* AND (renewal OR volunteer* OR voluntary OR participat* OR practical OR regenerat* OR restor* OR maintain* OR care OR enhance* OR preserve OR creat* OR activ* OR action* OR involve*)))) OR ab(((conservation* AND natural AND environment* AND (renewal OR volunteer* OR voluntary OR participat* OR practical OR regenerat* OR restor* OR maintain* OR care OR enhance* OR preserve OR creat* OR activ* OR action* OR involve*))))) AND la.exact("English") AND pd (19900101-20121002)	Applied Social Sciences Index and Abstracts (ASSIA)	12
S2	(ti (((Conservation NEAR/3 interventions))) OR ab(((Conservation NEAR/3 interventions)))) AND la.exact("English") AND pd(19900101-20121002)	Applied Social Sciences Index and Abstracts (ASSIA)	6
S3	(ti((((environmental* NEAR/3 (conservation* OR volunteer* OR steward*)) AND (Regenerat* OR restore OR restoration OR redevelop OR maintain OR enhance OR preserve OR preserving OR create OR creation OR establish OR establishing OR founding OR build* OR cultivat* OR cultivation OR participati* OR practical OR creat* OR activ* OR action* OR involve*)))) OR ab((((environmental* NEAR/3 (conservation* OR volunteer* OR steward*)) AND (Regenerat*	Applied Social Sciences Index and Abstracts (ASSIA)	17

(*Continued*)

	OR restore OR restoration OR redevelop OR maintain OR enhance OR preserve OR preserving OR create OR creation OR establish OR establishing OR founding OR build* OR cultivat* OR cultivation OR participati* OR practical OR creat* OR activ* OR action* OR involve*))))) AND la.exact("English") AND pd (19900101-20121002)		
S4	(ti((((conservation* NEAR/3 (group* OR volunteer* OR voluntary OR association* OR organisation* OR organization* OR participa* OR stakeholder* OR steward* OR trust OR ranger* OR activit*)) AND (Regenerat* OR restore OR restoration OR redevelop OR maintain OR enhance OR preserve OR preserving OR create OR creation OR establish OR establishing OR founding OR build* OR cultivat* OR cultivation OR participati* OR practical OR creat* OR activ* OR action* OR involve*)))) OR ab((((conservation* NEAR/3 (group* OR volunteer* OR voluntary OR association* OR organisation* OR organization* OR participa* OR stakeholder* OR steward* OR trust OR ranger* OR activit*)) AND (Regenerat* OR restore OR restoration OR redevelop OR maintain OR enhance OR preserve OR preserving OR create OR creation OR establish OR establishing OR founding OR build* OR cultivat* OR cultivation OR participati* OR practical OR	Applied Social Sciences Index and Abstracts (ASSIA)	29

(*Continued*)

	creat* OR activ* OR action* OR involve*))))) AND la.exact("English") AND pd (19900101-20121002)		
S5	(ti((((conservation* NEAR/3 (group* OR volunteer* OR voluntary OR association* OR organisation* OR organization* OR participa* OR stakeholder* OR steward* OR trust OR ranger* OR activit*)) AND (Regenerat* OR restore OR restoration OR redevelop OR maintain OR enhance OR preserve OR preserving OR create OR creation OR establish OR establishing OR founding OR build* OR cultivat* OR cultivation OR participati* OR practical OR creat* OR activ* OR action* OR involve*)))) OR ab((((conservation* NEAR/3 (group* OR volunteer* OR voluntary OR association* OR organisation* OR organization* OR participa* OR stakeholder* OR steward* OR trust OR ranger* OR activit*)) AND (Regenerat* OR restore OR restoration OR redevelop OR maintain OR enhance OR preserve OR preserving OR create OR creation OR establish OR establishing OR founding OR build* OR cultivat* OR cultivation OR participati* OR practical OR creat* OR activ* OR action* OR involve*))))) AND la.exact("English") AND pd (19900101-20121002)	Applied Social Sciences Index and Abstracts (ASSIA)	29
S6	(ti((((conservation* NEAR/5 (nature OR rural OR countryside OR outdoor* OR outside OR backcountry OR	Applied Social Sciences Index and Abstracts (ASSIA)	33

(*Continued*)

	hinterland OR outback OR wood* OR park* OR parkland OR garden* OR meadow* OR farm* OR (farm NEAR/1 land) OR horticultural OR floricultural OR botanical OR arboretum OR allotment* OR forest* OR rainforest OR moor* OR dale*1 OR marsh* OR mountain* OR beach* OR wilderness OR landscape* OR tree* OR copse* OR river* OR lake* OR canal* OR waterway OR wetland* OR (open NEAR/1 space*) OR (protected NEAR/1 area*) OR green* OR planning* OR footpath* OR trail* OR coast* OR cliff* OR dune* OR (bio NEAR/1 diversity) OR (eco NEAR/1 system) OR (protected NEAR/1 area*))) AND (Regenerat* OR restore OR restoration OR redevelop OR maintain OR enhance OR preserve OR preserving OR create OR creation OR establish OR establishing OR founding OR build* OR cultivat* OR cultivation OR participati* OR practical OR creat* OR activ* OR action* OR involve*)))) OR ab((((conservation* NEAR/5 (nature OR rural OR countryside OR outdoor* OR outside OR backcountry OR hinterland OR outback OR wood* OR park* OR parkland OR garden* OR meadow* OR farm* OR (farm NEAR/1 land) OR horticultural OR floricultural OR botanical OR arboretum OR allotment* OR forest* OR rainforest OR moor* OR dale*1		

(*Continued*)

	OR marsh* OR mountain* OR beach* OR wilderness OR landscape* OR tree* OR copse* OR river* OR lake* OR canal* OR waterway OR wetland* OR (open NEAR/1 space*) OR (protected NEAR/1 area*) OR green* OR planning* OR footpath* OR trail* OR coast* OR cliff* OR dune* OR (bio NEAR/1 diversity) OR (eco NEAR/1 system) OR (protected NEAR/1 area*))) AND (Regenerat* OR restore OR restoration OR redevelop OR maintain OR enhance OR preserve OR preserving OR create OR creation OR establish OR establishing OR founding OR build* OR cultivat* OR cultivation OR participati* OR practical OR creat* OR activ* OR action* OR involve*))))) AND la.exact("English") AND pd (19900101-20121002)		
S7	(ti(((geoconservation OR (geo NEAR/3 conservation)))) OR ab(((geoconservation OR (geo NEAR/3 conservation))))) AND la.exact("English") AND pd(19900101-20121002)	Applied Social Sciences Index and Abstracts (ASSIA)	0
S8	(ti((((activ* OR practical OR participat*) NEAR/3 conservation*))) OR ab((((activ* OR practical OR participat*) NEAR/3 conservation*)))) AND la.exact("English") AND pd(19900101-20121002)	Applied Social Sciences Index and Abstracts (ASSIA)	21
S9	(ti((nature OR rural OR countryside OR outdoor* OR outside OR backcountry OR hinterland OR out-	Applied Social Sciences Index and Abstracts (ASSIA)	46343

(*Continued*)

	back OR wood* OR park* OR parkland OR garden* OR meadow* OR farm* OR (farm NEAR/1 land) OR horticultural OR floricultural OR botanical OR arboretum OR allotment* OR forest* OR rainforest OR moor* OR dale* OR marsh* OR mountain* OR beach* OR wilderness OR landscape* OR tree* OR copse* OR river* OR lake* OR canal* OR waterway OR wetland* OR (open NEAR/1 space*) OR (protected NEAR/1 area*) OR green* OR planning* OR footpath* OR trail* OR coast* OR cliff* OR dune* OR (bio NEAR/1 diversity) OR (eco NEAR/1 system) OR (protected NEAR/1 area*))) OR ab((nature OR rural OR countryside OR outdoor* OR outside OR backcountry OR hinterland OR outback OR wood* OR park* OR parkland OR garden* OR meadow* OR farm* OR (farm NEAR/1 land) OR horticultural OR floricultural OR botanical OR arboretum OR allotment* OR forest* OR rainforest OR moor* OR dale* OR marsh* OR mountain* OR beach* OR wilderness OR landscape* OR tree* OR copse* OR river* OR lake* OR canal* OR waterway OR wetland* OR (open NEAR/1 space*) OR (protected NEAR/1 area*) OR green* OR planning* OR footpath* OR trail* OR coast* OR cliff* OR dune* OR (bio NEAR/1 diversity) OR (eco NEAR/1 system) OR (protected NEAR/1		

(*Continued*)

	area*)))) AND la.exact("English") AND pd(19900101-20121002)		
S10	SU.EXACT("Conservation") AND la.exact("English") AND pd(19900101-20121002)	Applied Social Sciences Index and Abstracts (ASSIA)	212
S11	S9 and S10	Applied Social Sciences Index and Abstracts (ASSIA)	95
S12	S1 OR S2 OR S3 OR S4 OR S5 OR S6 OR S7 or S8 or S11	Applied Social Sciences Index and Abstracts (ASSIA)	159
S13	(ti(((((Volunteer* OR voluntary) NEAR/5 (environment* OR nature OR rural OR countryside OR outdoor* OR outside OR backcountry OR hinterland OR outback OR wood* OR park* OR parkland OR garden* OR meadow* OR horticultural OR floricultural OR botanical OR arboretum OR allotment* OR forest* OR moor* OR dale* OR marsh* OR mountain* OR beach* OR wilderness OR landscape* OR tree* OR copse* OR river* OR lake* OR canal* OR waterway OR wetland* OR (open NEAR/1 space*) OR green* OR planning* OR footpath OR trail OR (bio NEAR/1 diversity))) AND (Regenerat* OR restore OR restoration OR redevelop OR maintain OR enhance OR preserve OR preserving OR create OR creation OR establish OR establishing OR founding OR build* OR cultivat* OR cultivation OR participati* OR practical OR creat* OR activ* OR action* OR involve*)))) OR ab((((Volunteer* OR voluntary)	Applied Social Sciences Index and Abstracts (ASSIA)	64

(*Continued*)

	NEAR/5 (environment* OR nature OR rural OR countryside OR outdoor* OR outside OR backcountry OR hinterland OR outback OR wood* OR park* OR parkland OR garden* OR meadow* OR horticultural OR floricultural OR botanical OR arboretum OR allotment* OR forest* OR moor* OR dale* OR marsh* OR mountain* OR beach* OR wilderness OR landscape* OR tree* OR copse* OR river* OR lake* OR canal* OR waterway OR wetland* OR (open NEAR/1 space*) OR green* OR planning* OR footpath OR trail OR (bio NEAR/1 diversity))) AND (Regenerat* OR restore OR restoration OR redevelop OR maintain OR enhance OR preserve OR preserving OR create OR creation OR establish OR establishing OR founding OR build* OR cultivat* OR cultivation OR participati* OR practical OR creat* OR activ* OR action* OR involve*))))) AND la.exact("English") AND pd (19900101-20121002)		
S14	(ti((((((voluntary OR volunteer*) NEAR/5 (group* OR association OR stakeholder* OR steward* OR ranger*)) AND (environment* OR nature OR rural OR outdoor* OR outside OR (open NEAR/1 space*) OR conservation* OR wood* OR park* OR parkland OR garden* OR backcountry OR hinterland OR horticultural OR allotment* OR landscape OR scenic OR Botanical OR Arboretum OR forest* OR	Applied Social Sciences Index and Abstracts (ASSIA)	33

(*Continued*)

	moor OR dale OR marsh* OR mountain* OR beach* OR wilderness OR wild OR tree* OR river* OR lake* OR canal* OR water OR waterway OR wetland* OR (open NEAR/1 space*) OR green* OR footpath OR trail)) AND (Regenerat* OR restore OR restoration OR redevelop OR maintain OR enhance OR preserve OR preserving OR create OR creation OR establish OR establishing OR founding OR build* OR cultivat* OR cultivation OR participati* OR practical OR creat* OR activ* OR action* OR involve*)))) OR ab((((((voluntary OR volunteer*) NEAR/5 (group* OR association OR stakeholder* OR steward* OR ranger*)) AND (environment* OR nature OR rural OR outdoor* OR outside OR (open NEAR/1 space*) OR conservation* OR wood* OR park* OR parkland OR garden* OR backcountry OR hinterland OR horticultural OR allotment* OR landscape OR scenic OR Botanical OR Arboretum OR forest* OR moor OR dale OR marsh* OR mountain* OR beach* OR wilderness OR wild OR tree* OR river* OR lake* OR canal* OR water OR waterway OR wetland* OR (open NEAR/1 space*) OR green* OR footpath OR trail)) AND (Regenerat* OR restore OR restoration OR redevelop OR maintain OR enhance OR preserve OR preserving OR create OR creation OR establish OR establishing OR		

(*Continued*)

	founding OR build* OR cultivat* OR cultivation OR participati* OR practical OR creat* OR activ* OR action* OR involve*))))) AND la.exact("English") AND pd (19900101-20121002)		
S15	S13 or S14	Applied Social Sciences Index and Abstracts (ASSIA)	93
S16	(ti(((Green* NEAR/3 (space* OR gym OR exercise OR volunteer* OR voluntary OR conservation OR infrastructure OR care OR streets OR communal OR Guerrilla)))) OR ab(((Green* NEAR/3 (space* OR gym OR exercise OR volunteer* OR voluntary OR conservation OR infrastructure OR care OR streets OR communal OR Guerrilla))))) AND la.exact("English") AND pd(19900101-20121002)	Applied Social Sciences Index and Abstracts (ASSIA)	82
S17	(ti((greenspace)) OR ab((greenspace))) AND la.exact("English") AND pd (19900101-20121002)	Applied Social Sciences Index and Abstracts (ASSIA)	10
S18	S16 or S17	Applied Social Sciences Index and Abstracts (ASSIA)	89
S19	(ti((((urban NEAR/3 (green* OR park* OR parkland OR garden* OR horticultur* OR wood* OR forest* OR botanical OR arboretum OR allotment* OR (open NEAR/1 space))) AND (Regenerat* OR restore OR restoration OR redevelop OR maintain OR enhance OR preserve OR preserving OR create OR creation OR establish OR establishing OR founding OR build* OR cultivat* OR cul-	Applied Social Sciences Index and Abstracts (ASSIA)	32

(*Continued*)

	tivation OR participati* OR practical OR creat* OR activ* OR action* OR involve*)))) OR ab((((urban NEAR/3 (green* OR park* OR parkland OR garden* OR horticultur* OR wood* OR forest* OR botanical OR arboretum OR allotment* OR (open NEAR/1 space))) AND (Regenerat* OR restore OR restoration OR redevelop OR maintain OR enhance OR preserve OR preserving OR create OR creation OR establish OR establishing OR founding OR build* OR cultivat* OR cultivation OR participati* OR practical OR creat* OR activ* OR action* OR involve*)))))) AND la.exact("English") AND pd (19900101-20121002)		
S20	(ti((((work* OR renewal OR volunteer* OR voluntary OR practical OR regenerat* OR restor* OR maintain* OR care OR enhance OR preserve OR creat*) AND (urban OR city OR metropolis OR town*) AND (garden* OR park* OR parkland OR allotment*)))) OR ab((((work* OR renewal OR volunteer* OR voluntary OR practical OR regenerat* OR restor* OR maintain* OR care OR enhance OR preserve OR creat*) AND (urban OR city OR metropolis OR town*) AND (garden* OR park* OR parkland OR allotment*)))))) AND la.exact("English") AND pd (19900101-20121002)	Applied Social Sciences Index and Abstracts (ASSIA)	72
S21	S19 or S20	Applied Social Sciences Index and Abstracts (ASSIA)	96

(*Continued*)

S22	(ti ((((garden* OR horticulture OR allotment* OR botanical OR arboretum) NEAR/5 (kitchen OR school* OR college* OR university OR campus OR hospital* OR prison* OR penitentiary OR institution OR urban OR green* OR communit* OR communal OR group* OR guerrilla OR (bio NEAR/1 diver*) OR eco)))) OR ab ((((garden* OR horticulture OR allotment* OR botanical OR arboretum) NEAR/5 (kitchen OR school* OR college* OR university OR campus OR hospital* OR prison* OR penitentiary OR institution OR urban OR green* OR communit* OR communal OR group* OR guerrilla OR (bio NEAR/1 diver*) OR eco))))) AND la.exact("English") AND pd(19900101-20121002)	Applied Social Sciences Index and Abstracts (ASSIA)	63
S23	(ti ((((garden* OR horticulture OR allotment* OR botanical OR arboretum) AND (grow AND (your own))))) OR ab ((((garden* OR horticulture OR allotment* OR botanical OR arboretum) AND (grow AND (your own)))))) AND la.exact("English") AND pd (19900101-20121002)	Applied Social Sciences Index and Abstracts (ASSIA)	0
S24	(ti ((((garden* OR horticulture OR allotment* OR botanical OR arboretum) AND (pick AND (your own))))) OR ab ((((garden* OR horticulture OR allotment* OR botanical OR arboretum) AND (pick AND (your own)))))) AND	Applied Social Sciences Index and Abstracts (ASSIA)	0

(*Continued*)

	la.exact("English") AND pd (19900101-20121002)		
S25	(ti((((garden* OR horticulture OR allotment* OR botanical OR arboretum) NEAR/5 (renew* OR maintain* OR creat* OR culivat* OR enhance* OR restore OR regenerat* OR activ* OR preserve OR voluntary OR volunteer OR conservation* OR participat*)))) OR ab((((garden* OR horticulture OR allotment* OR botanical OR arboretum) NEAR/5 (renew* OR maintain* OR creat* OR culivat* OR enhance* OR restore OR regenerat* OR activ* OR preserve OR voluntary OR volunteer OR conservation* OR participat*))))) AND la.exact("English") AND pd(19900101-20121002)	Applied Social Sciences Index and Abstracts (ASSIA)	46
S26	S22 or S23 or S24 or S25	Applied Social Sciences Index and Abstracts (ASSIA)	94
S27	(ti(((((communit* NEAR/5 (group* OR team* OR association* OR organisation OR organization OR participa* OR stakeholder* OR steward* OR trust* OR ranger* OR activit*)) AND (garden* OR allotment* OR forest OR (natural AND environment) OR conservation*)) AND (Regenerat* OR restore OR restoration OR redevelop OR maintain OR enhance OR preserve OR preserving OR create OR creation OR establish OR establishing OR founding OR build* OR cultivat* OR cultivation OR participati* OR practical OR creat* OR activ* OR	Applied Social Sciences Index and Abstracts (ASSIA)	49

(*Continued*)

	action* OR involve*)))) OR ab(((((communit* NEAR/5 (group* OR team* OR association* OR organisation OR organization OR participa* OR stakeholder* OR steward* OR trust* OR ranger* OR activit*)) AND (garden* OR allotment* OR forest OR (natural AND environment) OR conservation*)) AND (Regenerat* OR restore OR restoration OR redevelop OR maintain OR enhance OR preserve OR preserving OR create OR creation OR establish OR establishing OR founding OR build* OR cultivat* OR cultivation OR participati* OR practical OR creat* OR activ* OR action* OR involve*))))) AND la.exact("English") AND pd (19900101-20121002)		
S28	(ti ((((communit* AND (work* OR renewal OR volunteer* OR voluntary OR practical OR regenerat* OR restor* OR maintain* OR care OR enhance* OR preserve OR creat* OR activ* OR action* OR involve*) AND ((natur* adj3 environment*) OR (environmental* AND conservation*))) AND (Regenerat* OR restore OR restoration OR redevelop OR maintain OR enhance OR preserve OR preserving OR create OR creation OR establish OR establishing OR founding OR build* OR cultivat* OR cultivation OR participati* OR practical OR creat* OR activ* OR action* OR involve*)))) OR ab((((communit* AND (work* OR renewal OR vol-	Applied Social Sciences Index and Abstracts (ASSIA)	10

(*Continued*)

	unteer* OR voluntary OR practical OR regenerat* OR restor* OR maintain* OR care OR enhance* OR preserve OR creat* OR activ* OR action* OR involve*) AND ((natur* adj3 environment*) OR (environmental* AND conservation*))) AND (Regenerat* OR restore OR restoration OR redevelop OR maintain OR enhance OR preserve OR preserving OR create OR creation OR establish OR establishing OR founding OR build* OR cultivat* OR cultivation OR participati* OR practical OR creat* OR activ* OR action* OR involve*)))) AND la.exact("English") AND pd (19900101-20121002)		
S29	(ti(((((communit* OR local) NEAR/5 (garden* OR park* OR green* OR greenspace OR outdoor* OR outside* OR pavement* OR sidewalk* OR wood* OR allotment* OR lake* OR canal* OR river*)) AND (work* OR renewal OR volunteer* OR voluntary OR practical OR participat* OR regenerat* OR restor* OR maintain* OR enhance OR preserve OR creat*)))) OR ab(((((communit* OR local) NEAR/5 (garden* OR park* OR green* OR greenspace OR outdoor* OR outside* OR pavement* OR sidewalk* OR wood* OR allotment* OR lake* OR canal* OR river*)) AND (work* OR renewal OR volunteer* OR voluntary OR practical OR participat* OR regenerat* OR restor* OR maintain* OR enhance OR	Applied Social Sciences Index and Abstracts (ASSIA)	148

(*Continued*)

	preserve OR creat*))))) AND la.exact("English") AND pd (19900101-20121002)		
S30	S27 or S28 or S29	Applied Social Sciences Index and Abstracts (ASSIA)	194
S31	S12 or S15 or S18 or S21 or S26 or S30	Applied Social Sciences Index and Abstracts (ASSIA)	658
S32	(ti((((clinical OR surgery OR surgical OR cell OR cells OR laboratory OR placebo OR bladder OR uterus OR breast OR gene OR genes OR genetic OR bowel OR liver OR enzymes OR viral OR lymph OR molecular)))) OR ab((((clinical OR surgery OR surgical OR cell OR cells OR laboratory OR placebo OR bladder OR uterus OR breast OR gene OR genes OR genetic OR bowel OR liver OR enzymes OR viral OR lymph OR molecular))))) AND la.exact("English") AND pd(19900101-20121002)	Applied Social Sciences Index and Abstracts (ASSIA)	58888
S33	S31 NOT S32	Applied Social Sciences Index and Abstracts (ASSIA)	629

Hits: 629
Notes: N/A
File Saved: ASSIA 629.txt
Database(s): Social Services Abstracts
Host: ProQuest
Data Parameters: 1979-Current
Date Searched: 2nd October 2012
Searched By: Cooper
Strategy Checked by: KH, RL and RG
Search Strategy:

Search Strategy
Set#
Searched for
Databases
Results
S1
(ti(((((conservation* AND natural AND environment* AND (renewal OR volunteer* OR voluntary OR participate* OR practical OR regenerate* OR restor* OR maintain* OR care OR enhance* OR preserve OR great* OR activ* OR action* OR involve*))))) OR ab(((((conservation* AND natural AND environment* AND (renewal OR volunteer* OR voluntary OR participate* OR practical OR regenerate* OR restor* OR maintain* OR care OR enhance* OR preserve OR great* OR activ* OR action* OR involve*)))))) AND la.exact("English") AND pd(19900101-20121002)
Social Services Abstracts
14°
S2
(ti(((((Conservation NEAR/3 interventions)))) OR ab(((((Conservation NEAR/3 interventions))))) AND la.exact("English") AND pd(19900101-20121002)
Social Services Abstracts
2°
S3
(ti(((((environmental* NEAR/3 (conservation* OR volunteer* OR steward*)) AND (Regenerat* OR restore OR restoration OR redevelop OR maintain OR enhance OR preserve OR preserving OR create OR creation OR establish OR establishing OR founding OR build* OR cultivat* OR cultivation OR participate OR participation))))) OR ab(((((environmental* NEAR/3 (conservation* OR volunteer* OR steward*)) AND (Regenerat* OR restore OR restoration OR redevelop OR maintain OR enhance OR preserve OR preserving OR create OR creation OR establish OR establishing OR founding OR build* OR cultivat* OR cultivation OR participate OR participation)))))) AND la.exact("English") AND pd(19900101-20121002)
Social Services Abstracts
10°
S4
(ti(((((conservation* NEAR/3 (group* OR volunteer* OR voluntary OR association* OR organisation* OR organization* OR participa* OR stakeholder* OR steward* OR trust OR ranger* OR activit*))))) OR ab(((((conservation* NEAR/3 (group* OR volunteer* OR voluntary OR association* OR organisation* OR organization* OR participa* OR stakeholder* OR steward* OR trust OR ranger* OR activit*)))))) AND la.exact("English") AND pd(19900101-20121002)
Social Services Abstracts
36°
S5
(ti(((((conservation* NEAR/5 (nature OR rural OR countryside OR outdoor* OR outside OR backcountry OR hinterland OR outback OR wood* OR park* OR parkland OR garden* OR meadow* OR farm* OR (farm NEAR/1 land) OR horticultural OR floricultural OR botanical OR arboretum OR allotment* OR forest* OR rainforest OR moor* OR dale* OR marsh* OR mountain* OR beach* OR wilderness OR landscape* OR tree* OR copse* OR river* OR lake* OR canal* OR waterway OR wetland* OR (open NEAR/1 space*) OR (protected NEAR/1 area*) OR green* OR planning* OR footpath* OR trail* OR coast* OR cliff* OR dune* OR (bio NEAR/1 diversity) OR (eco NEAR/1 system) OR (protected NEAR/1 area*))))))) OR ab(((((conservation* NEAR/5 (nature OR rural OR countryside OR outdoor* OR outside OR backcountry OR hinterland OR outback OR wood* OR park* OR parkland OR garden* OR meadow* OR farm* OR (farm NEAR/1 land) OR horticultural OR floricultural OR botanical OR arboretum OR allotment* OR forest* OR rainforest OR moor* OR dale* OR marsh* OR mountain* OR beach* OR wilderness OR landscape* OR tree* OR copse* OR river* OR lake* OR canal* OR waterway OR wetland* OR (open NEAR/1 space*) OR (protected NEAR/1 area*) OR green* OR planning* OR footpath* OR trail* OR coast* OR cliff* OR dune* OR (bio NEAR/1 diversity) OR (eco NEAR/1 system) OR (protected NEAR/1 area*)))))))) AND la.exact("English") AND pd(19900101-20121002)
Social Services Abstracts
95°
S6

(ti((geo NEAR/3 conservation)) OR ab((geo NEAR/3 conservation))) AND la.exact("English") AND pd(19900101-20121002)
Social Services Abstracts
0°
S7
SU.EXACT("Conservation")
Social Services Abstracts
313°
S8
(ti(((((nature OR rural OR countryside OR outdoor* OR outside OR backcountry OR hinterland OR outback OR wood* OR park* OR parkland OR garden* OR meadow* OR farm* OR (farm NEAR/1 land) OR horticultural OR floricultural OR botanical OR arboretum OR allotment* OR forest* OR rainforest OR moor* OR dale* OR marsh* OR mountain* OR beach* OR wilderness OR landscape* OR tree* OR copse* OR river* OR lake* OR canal* OR waterway OR wetland* OR (open NEAR/1 space*) OR (protected NEAR/1 area*) OR green* OR planning* OR footpath* OR trail* OR coast* OR cliff* OR dune* OR (bio NEAR/1 diversity) OR (eco NEAR/1 system) OR (protected NEAR/1 area*)))))) OR ab(((((nature OR rural OR countryside OR outdoor* OR outside OR backcountry OR hinterland OR outback OR wood* OR park* OR parkland OR garden* OR meadow* OR farm* OR (farm NEAR/1 land) OR horticultural OR floricultural OR botanical OR arboretum OR allotment* OR forest* OR rainforest OR moor* OR dale* OR marsh* OR mountain* OR beach* OR wilderness OR landscape* OR tree* OR copse* OR river* OR lake* OR canal* OR waterway OR wetland* OR (open NEAR/1 space*) OR (protected NEAR/1 area*) OR green* OR planning* OR footpath* OR trail* OR coast* OR cliff* OR dune* OR (bio NEAR/1 diversity) OR (eco NEAR/1 system) OR (protected NEAR/1 area*))))))) AND la.exact("English") AND pd(19900101-20121002)
Social Services Abstracts
27065*
S9
S7 and S8
Social Services Abstracts
148°
S10
(ti((volunteer* OR voluntary)) OR ab((volunteer* OR voluntary))) AND la.exact("English") AND pd(19900101-20121002)
Social Services Abstracts
3545°
S11
S10 and S8
Social Services Abstracts
714°
S12
S9 or S11
Social Services Abstracts
855°
S13
S1 or S2 or S3 or S4 or S5 or S6
Social Services Abstracts
134°
S14
(ti(((((((Volunteer* OR voluntary) NEAR/5 (environment* OR nature OR rural OR countryside OR outdoor* OR outside OR backcountry OR hinterland OR outback OR wood* OR park* OR parkland OR garden* OR meadow* OR horticultural OR floricultural OR botanical OR arboretum OR allotment* OR forest* OR moor* OR dale* OR marsh* OR mountain* OR beach* OR wilderness OR landscape* OR tree* OR copse* OR river* OR lake* OR canal* OR waterway OR wetland* OR (open NEAR/1 space*) OR green* OR planning* OR footpath OR trail OR (bio NEAR/1 diversity))))))) OR ab(((((((Volunteer* OR voluntary) NEAR/5 (environment* OR nature OR rural OR countryside OR outdoor* OR outside OR backcountry OR hinterland OR outback

OR wood* OR park* OR parkland OR garden* OR meadow* OR horticultural OR floricultural OR botanical OR arboretum OR allotment* OR forest* OR moor* OR dale* OR marsh* OR mountain* OR beach* OR wilderness OR landscape* OR tree* OR copse* OR river* OR lake* OR canal* OR waterway OR wetland* OR (open NEAR/1 space*) OR green* OR planning* OR footpath OR trail OR (bio NEAR/1 diversity)))))))) AND la.exact("English") AND pd(19900101-20121002)
Social Services Abstracts
137°
S15
(ti(((((((voluntary OR volunteer*) NEAR/5 (group* OR association OR stakeholder* OR steward* OR ranger*)) AND (environment* OR nature OR rural OR outdoor* OR outside OR (open NEAR/1 space*) OR conservation* OR wood* OR park* OR parkland OR garden* OR backcountry OR hinterland OR horticultural OR allotment* OR landscape OR scenic OR Botanical OR Arboretum OR forest* OR moor OR dale OR marsh* OR mountain* OR beach* OR wilderness OR wild OR tree* OR river* OR lake* OR canal* OR water OR waterway OR wetland* OR (open NEAR/1 space*) OR green* OR footpath OR trail)))))) OR ab(((((((voluntary OR volunteer*) NEAR/5 (group* OR association OR stakeholder* OR steward* OR ranger*)) AND (environment* OR nature OR rural OR outdoor* OR outside OR (open NEAR/1 space*) OR conservation* OR wood* OR park* OR parkland OR garden* OR backcountry OR hinterland OR horticultural OR allotment* OR landscape OR scenic OR Botanical OR Arboretum OR forest* OR moor OR dale OR marsh* OR mountain* OR beach* OR wilderness OR wild OR tree* OR river* OR lake* OR canal* OR water OR waterway OR wetland* OR (open NEAR/1 space*) OR green* OR footpath OR trail))))))) AND la.exact("English") AND pd(19900101-20121002)
Social Services Abstracts
69°
S16
S14 or S15
Social Services Abstracts
195°
S17
(ti((((((Green* NEAR/3 (space* OR gym OR exercise OR volunteer* OR voluntary OR conservation OR infrastructure OR care OR streets OR communal OR Guerrilla)))))) OR ab((((((Green* NEAR/3 (space* OR gym OR exercise OR volunteer* OR voluntary OR conservation OR infrastructure OR care OR streets OR communal OR Guerrilla))))))) AND la.exact("English") AND pd(19900101-20121002)
Social Services Abstracts
53°
S18
(ti((greenspace)) OR ab((greenspace))) AND la.exact("English") AND pd(19900101-20121002)
Social Services Abstracts
4°
S19
S17 or S18
Social Services Abstracts
57°
S20
(ti(((((((work* OR renewal OR volunteer* OR voluntary OR practical OR regenerat* OR restor* OR maintain* OR care OR enhance OR preserve OR creat*) AND (urban OR city OR metropolis OR town*) AND (garden* OR park* OR parkland OR allotment*)))))) OR ab((((((work* OR renewal OR volunteer* OR voluntary OR practical OR regenerat* OR restor* OR maintain* OR care OR enhance OR preserve OR creat*) AND (urban OR city OR metropolis OR town*) AND (garden* OR park* OR parkland OR allotment*))))))) AND la.exact("English") AND pd(19900101-20121002)
Social Services Abstracts
314°
S21
(ti(((urban NEAR/3 (green* OR park* OR parkland OR garden* OR horticultur* OR wood* OR forest* OR botanical OR arboretum

OR allotment* OR (open NEAR/1 space))))) OR ab(((urban NEAR/3 (green* OR park* OR parkland OR garden* OR horticultur* OR wood* OR forest* OR botanical OR arboretum OR allotment* OR (open NEAR/1 space)))))) AND la.exact("English") AND pd(19900101-20121002)
Social Services Abstracts
90°
S22
S20 or S21
Social Services Abstracts
397°
S23
(ti((((((garden* OR horticulture OR allotment* OR botanical OR arboretum) NEAR/5 (maintain* OR creat* OR culivat* OR enhance* OR preserve OR voluntary OR volunteer OR conservation* OR participat*)))))) OR ab((((((garden* OR horticulture OR allotment* OR botanical OR arboretum) NEAR/5 (maintain* OR creat* OR culivat* OR enhance* OR preserve OR voluntary OR volunteer OR conservation* OR participat*))))))) AND la.exact("English") AND pd(19900101-20121002)
Social Services Abstracts
19°
S24
(ti(((garden* OR horticulture OR allotment* OR botanical OR arboretum) NEAR/5 (kitchen OR school* OR college* OR university OR campus OR hospital* OR prison* OR penitentiary OR institution OR urban OR green* OR communit* OR communal OR group* OR guerrilla OR (bio NEAR/1 diver*) OR eco))) OR ab(((garden* OR horticulture OR allotment* OR botanical OR arboretum) NEAR/5 (kitchen OR school* OR college* OR university OR campus OR hospital* OR prison* OR penitentiary OR institution OR urban OR green* OR communit* OR communal OR group* OR guerrilla OR (bio NEAR/1 diver*) OR eco)))) AND la.exact("English") AND pd(19900101-20121002)
Social Services Abstracts
53°
S25
SU.EXACT("Conservation") AND SU.EXACT("Gardening")
Social Services Abstracts
0°
S26
((ti((((((garden* OR horticulture OR allotment* OR botanical OR arboretum) NEAR/5 (maintain* OR creat* OR culivat* OR enhance* OR preserve OR voluntary OR volunteer OR conservation* OR participat*)))))) OR ab((((((garden* OR horticulture OR allotment* OR botanical OR arboretum) NEAR/5 (maintain* OR creat* OR culivat* OR enhance* OR preserve OR voluntary OR volunteer OR conservation* OR participat*))))))) AND la.exact("English") AND pd(19900101-20121002)) OR ((ti(((garden* OR horticulture OR allotment* OR botanical OR arboretum) NEAR/5 (kitchen OR school* OR college* OR university OR campus OR hospital* OR prison* OR penitentiary OR institution OR urban OR green* OR communit* OR communal OR group* OR guerrilla OR (bio NEAR/1 diver*) OR eco))) OR ab(((garden* OR horticulture OR allotment* OR botanical OR arboretum) NEAR/5 (kitchen OR school* OR college* OR university OR campus OR hospital* OR prison* OR penitentiary OR institution OR urban OR green* OR communit* OR communal OR group* OR guerrilla OR (bio NEAR/1 diver*) OR eco)))) AND la.exact("English") AND pd(19900101-20121002)) OR (SU.EXACT.EXPLODE("Gardens") AND SU.EXACT.EXPLODE("Conservation Education") AND la.exact("English") AND pd(19900101-20121002))
Social Services Abstracts
65°
S27
ti(((((kitchen OR school* OR college* OR university OR campus OR hospital* OR prison* OR penitentiary OR institution OR urban OR green* OR community* OR communal OR group* OR guerrilla OR (bio NEAR/1 diver*) OR eco OR maintain* OR great* OR cultivate* OR voluntary OR volunteer OR conservation* OR participate*))))) AND ab(((((kitchen OR school* OR college* OR university OR campus OR hospital* OR prison* OR penitentiary OR institution OR urban OR green* OR community* OR communal OR group* OR guerrilla OR (bio NEAR/1 diver*) OR eco OR maintain* OR great* OR cultivate* OR voluntary

OR volunteer OR conservation* OR participate*))))) AND la.exact("English") AND pd(19900101-20121002)
Social Services Abstracts
21523*
S28
SU.EXACT("Gardening")
Social Services Abstracts
46°
S29
S27 and S28
Social Services Abstracts
15°
S30
(ti((((((communit* NEAR/5 (group* OR team* OR association* OR organisation OR organization OR participa* OR stakeholder* OR steward* OR trust* OR ranger* OR activit*)) AND (garden* OR allotment* OR forest OR (natural AND environment) OR conservation*)))))) OR ab((((((communit* NEAR/5 (group* OR team* OR association* OR organisation OR organization OR participa* OR stakeholder* OR steward* OR trust* OR ranger* OR activit*)) AND (garden* OR allotment* OR forest OR (natural AND environment) OR conservation*)))))) AND la.exact("English") AND pd(19900101-20121002)
Social Services Abstracts
60°
S31
(ti(((((communit* AND (work* OR renewal OR volunteer* OR voluntary OR practical OR regenerat* OR restor* OR maintain* OR care OR enhance* OR preserve OR creat* OR activ* OR action* OR involve*) AND ((natur* NEAR/3 environment*) OR (environmental* AND conservation*)))))) OR ab(((((communit* AND (work* OR renewal OR volunteer* OR voluntary OR practical OR regenerat* OR restor* OR maintain* OR care OR enhance* OR preserve OR creat* OR activ* OR action* OR involve*) AND ((natur* NEAR/3 environment*) OR (environmental* AND conservation*)))))))) AND la.exact("English") AND pd(19900101-20121002)
Social Services Abstracts
49°
S32
(ti(((((((communit* OR local) NEAR/5 (garden* OR park* OR green* OR greenspace OR outdoor* OR outside* OR pavement* OR sidewalk* OR wood* OR allotment* OR lake* OR canal* OR river*)) AND (work* OR renewal OR volunteer* OR voluntary OR practical OR participat* OR regenerat* OR restor* OR maintain* OR enhance OR preserve OR creat*)))))) OR ab(((((((communit* OR local) NEAR/5 (garden* OR park* OR green* OR greenspace OR outdoor* OR outside* OR pavement* OR sidewalk* OR wood* OR allotment* OR lake* OR canal* OR river*)) AND (work* OR renewal OR volunteer* OR voluntary OR practical OR participat* OR regenerat* OR restor* OR maintain* OR enhance OR preserve OR creat*)))))) AND la.exact("English") AND pd(19900101-20121002)
Social Services Abstracts
161°
S33
S30 or S31 or S32
Social Services Abstracts
246°
S34
(ti(((Health* OR (quality NEAR/3 life) OR (well NEAR/3 being) OR wellbeing OR emotion*))) OR ab(((Health* OR (quality NEAR/3 life) OR (well NEAR/3 being) OR wellbeing OR emotion*)))) AND la.exact("English") AND pd(19900101-20121002)
Social Services Abstracts
50359*
S35
S23 or S24 or S26 or S29

Social Services Abstracts
68°
S36
S12 and S34
Social Services Abstracts
249°
S37
S13 and S34
Social Services Abstracts
10°
S38
S16 and S34
Social Services Abstracts
55°
S39
S19 and S34
Social Services Abstracts
19°
S40
S22 and S34
Social Services Abstracts
125°
S41
S33 and S34
Social Services Abstracts
65°
S42
S35 and S34
Social Services Abstracts
20°

Notes: The ProQuest interface could not successfully combine the search lines without crashing the search. Lines S36-S42 were individually downloaded and de-duplicated in Endnote.
File Saved: SSA 563.ris
Database(s): Sociological Abstracts
Host: ProQuest
Data Parameters: 1952-Current
Date Searched: 2nd October 2012
Searched By: Cooper
Strategy Checked by: KH, RL and RG
Search Strategy:

Search Strategy
Set#
Searched for
Databases
Results
S1
(ti(((((conservation* AND natural AND environment* AND (renewal OR volunteer* OR voluntary OR participate* OR practical OR regenerate* OR restor* OR maintain* OR care OR enhance* OR preserve OR great* OR activ* OR action* OR involve*))))) OR ab(((((conservation* AND natural AND environment* AND (renewal OR volunteer* OR voluntary OR participate* OR practical OR regenerate* OR restor* OR maintain* OR care OR enhance* OR preserve OR great* OR activ* OR action* OR involve*)))))) AND la.exact("English") AND pd(19900101-20121002)
Sociological Abstracts
151°
S2
(ti(((((Conservation NEAR/3 interventions)))) OR ab(((((Conservation NEAR/3 interventions))))) AND la.exact("English") AND pd (19900101-20121002)
Sociological Abstracts
26°
S3
(ti(((((environmental* NEAR/3 (conservation* OR volunteer* OR steward*)) AND (Regenerat* OR restore OR restoration OR redevelop OR maintain OR enhance OR preserve OR preserving OR create OR creation OR establish OR establishing OR founding OR build* OR cultivat* OR cultivation OR participate OR participation))))) OR ab(((((environmental* NEAR/3 (conservation* OR volunteer* OR steward*)) AND (Regenerat* OR restore OR restoration OR redevelop OR maintain OR enhance OR preserve OR preserving OR create OR creation OR establish OR establishing OR founding OR build* OR cultivat* OR cultivation OR participate OR participation)))))) AND la.exact("English") AND pd(19900101-20121002)
Sociological Abstracts
133°
S4
(ti(((((conservation* NEAR/3 (group* OR volunteer* OR voluntary OR association* OR organisation* OR organization* OR participa* OR stakeholder* OR steward* OR trust OR ranger* OR activit*))))) OR ab(((((conservation* NEAR/3 (group* OR volunteer* OR voluntary OR association* OR organisation* OR organization* OR participa* OR stakeholder* OR steward* OR trust OR ranger* OR activit*)))))) AND la.exact("English") AND pd(19900101-20121002)
Sociological Abstracts
259°
S5
(ti(((((conservation* NEAR/5 (nature OR rural OR countryside OR outdoor* OR outside OR backcountry OR hinterland OR outback OR wood* OR park* OR parkland OR garden* OR meadow* OR farm* OR (farm NEAR/1 land) OR horticultural OR floricultural OR botanical OR arboretum OR allotment* OR forest* OR rainforest OR moor* OR dale* OR marsh* OR mountain* OR beach* OR wilderness OR landscape* OR tree* OR copse* OR river* OR lake* OR canal* OR waterway OR wetland* OR (open NEAR/1 space*) OR (protected NEAR/1 area*) OR green* OR planning* OR footpath* OR trail* OR coast* OR cliff* OR dune* OR (bio NEAR/1 diversity) OR (eco NEAR/1 system) OR (protected NEAR/1 area*)))))))) OR ab(((((conservation* NEAR/5 (nature OR rural OR countryside OR outdoor* OR outside OR backcountry OR hinterland OR outback OR wood* OR park* OR parkland OR garden* OR meadow* OR farm* OR (farm NEAR/1 land) OR horticultural OR floricultural OR botanical OR arboretum OR allotment* OR forest* OR rainforest OR moor* OR dale* OR marsh* OR mountain* OR beach* OR wilderness OR landscape* OR tree* OR copse* OR river* OR lake* OR canal* OR waterway OR wetland* OR (open NEAR/1 space*) OR (protected NEAR/1 area*) OR green* OR planning* OR footpath* OR trail* OR coast* OR cliff* OR dune* OR (bio NEAR/1 diversity) OR (eco NEAR/1 system) OR (protected NEAR/1 area*)))))))) AND la.exact("English") AND pd(19900101-20121002)
Sociological Abstracts
919°
S6

(ti((geo NEAR/3 conservation)) OR ab((geo NEAR/3 conservation))) AND la.exact("English") AND pd(19900101-20121002)
Sociological Abstracts
0°
S7
SU.EXACT("Conservation")
Sociological Abstracts
1912°
S8
(ti(((((nature OR rural OR countryside OR outdoor* OR outside OR backcountry OR hinterland OR outback OR wood* OR park* OR parkland OR garden* OR meadow* OR farm* OR (farm NEAR/1 land) OR horticultural OR floricultural OR botanical OR arboretum OR allotment* OR forest* OR rainforest OR moor* OR dale* OR marsh* OR mountain* OR beach* OR wilderness OR landscape* OR tree* OR copse* OR river* OR lake* OR canal* OR waterway OR wetland* OR (open NEAR/1 space*) OR (protected NEAR/1 area*) OR green* OR planning* OR footpath* OR trail* OR coast* OR cliff* OR dune* OR (bio NEAR/1 diversity) OR (eco NEAR/1 system) OR (protected NEAR/1 area*)))))) OR ab(((((nature OR rural OR countryside OR outdoor* OR outside OR backcountry OR hinterland OR outback OR wood* OR park* OR parkland OR garden* OR meadow* OR farm* OR (farm NEAR/1 land) OR horticultural OR floricultural OR botanical OR arboretum OR allotment* OR forest* OR rainforest OR moor* OR dale* OR marsh* OR mountain* OR beach* OR wilderness OR landscape* OR tree* OR copse* OR river* OR lake* OR canal* OR waterway OR wetland* OR (open NEAR/1 space*) OR (protected NEAR/1 area*) OR green* OR planning* OR footpath* OR trail* OR coast* OR cliff* OR dune* OR (bio NEAR/1 diversity) OR (eco NEAR/1 system) OR (protected NEAR/1 area*))))))) AND la.exact("English") AND pd(19900101-20121002)
Sociological Abstracts
138819*
S9
S7 and S8
Sociological Abstracts
1080°
S10
S1 or S2 or S3 or S4 or S5 or S6 or S6 or S9
Sociological Abstracts
1838°
S11
(ti((((((Volunteer* OR voluntary) NEAR/5 (environment* OR nature OR rural OR countryside OR outdoor* OR outside OR backcountry OR hinterland OR outback OR wood* OR park* OR parkland OR garden* OR meadow* OR horticultural OR floricultural OR botanical OR arboretum OR allotment* OR forest* OR moor* OR dale* OR marsh* OR mountain* OR beach* OR wilderness OR landscape* OR tree* OR copse* OR river* OR lake* OR canal* OR waterway OR wetland* OR (open NEAR/1 space*) OR green* OR planning* OR footpath OR trail OR (bio NEAR/1 diversity))))))) OR ab((((((Volunteer* OR voluntary) NEAR/5 (environment* OR nature OR rural OR countryside OR outdoor* OR outside OR backcountry OR hinterland OR outback OR wood* OR park* OR parkland OR garden* OR meadow* OR horticultural OR floricultural OR botanical OR arboretum OR allotment* OR forest* OR moor* OR dale* OR marsh* OR mountain* OR beach* OR wilderness OR landscape* OR tree* OR copse* OR river* OR lake* OR canal* OR waterway OR wetland* OR (open NEAR/1 space*) OR green* OR planning* OR footpath OR trail OR (bio NEAR/1 diversity)))))))) AND la.exact("English") AND pd(19900101-20121002)
Sociological Abstracts
446°
S12
(ti(((((((voluntary OR volunteer*) NEAR/5 (group* OR association OR stakeholder* OR steward* OR ranger*)) AND (environment* OR nature OR rural OR outdoor* OR outside OR (open NEAR/1 space*) OR conservation* OR wood* OR park* OR parkland OR garden* OR backcountry OR hinterland OR horticultural OR allotment* OR landscape OR scenic OR Botanical OR Arboretum OR forest* OR moor OR dale OR marsh* OR mountain* OR beach* OR wilderness OR wild OR tree* OR river* OR lake* OR canal* OR water OR waterway OR wetland* OR (open NEAR/1 space*) OR green* OR footpath OR trail)))))) OR ab(((((((voluntary

OR volunteer*) NEAR/5 (group* OR association OR stakeholder* OR steward* OR ranger*)) AND (environment* OR nature OR rural OR outdoor* OR outside OR (open NEAR/1 space*) OR conservation* OR wood* OR park* OR parkland OR garden* OR backcountry OR hinterland OR horticultural OR allotment* OR landscape OR scenic OR Botanical OR Arboretum OR forest* OR moor OR dale OR marsh* OR mountain* OR beach* OR wilderness OR wild OR tree* OR river* OR lake* OR canal* OR water OR waterway OR wetland* OR (open NEAR/1 space*) OR green* OR footpath OR trail))))))) AND la.exact("English") AND pd (19900101-20121002)
Sociological Abstracts
313°
S13
S11 or S12
Sociological Abstracts
704°
S14
(ti(((((Green* NEAR/3 (space* OR gym OR exercise OR volunteer* OR voluntary OR conservation OR infrastructure OR care OR streets OR communal OR Guerrilla)))))) OR ab(((((Green* NEAR/3 (space* OR gym OR exercise OR volunteer* OR voluntary OR conservation OR infrastructure OR care OR streets OR communal OR Guerrilla))))))) AND la.exact("English") AND pd(19900101-20121002)
Sociological Abstracts
183°
S15
(ti((greenspace)) OR ab((greenspace))) AND la.exact("English") AND pd(19900101-20121002)
Sociological Abstracts
11°
S16
S14 or S15
Sociological Abstracts
194°
S17
(ti(((((((work* OR renewal OR volunteer* OR voluntary OR practical OR regenerat* OR restor* OR maintain* OR care OR enhance OR preserve OR creat*) AND (urban OR city OR metropolis OR town*) AND (garden* OR park* OR parkland OR allotment*)))))) OR ab(((((((work* OR renewal OR volunteer* OR voluntary OR practical OR regenerat* OR restor* OR maintain* OR care OR enhance OR preserve OR creat*) AND (urban OR city OR metropolis OR town*) AND (garden* OR park* OR parkland OR allotment*))))))) AND la.exact("English") AND pd(19900101-20121002)
Sociological Abstracts
2652°
S18
(ti(((urban NEAR/3 (green* OR park* OR parkland OR garden* OR horticultur* OR wood* OR forest* OR botanical OR arboretum OR allotment* OR (open NEAR/1 space))))) OR ab(((urban NEAR/3 (green* OR park* OR parkland OR garden* OR horticultur* OR wood* OR forest* OR botanical OR arboretum OR allotment* OR (open NEAR/1 space)))))) AND la.exact("English") AND pd(19900101-20121002)
Sociological Abstracts
305°
S19
S17 or S18
Sociological Abstracts
2897°
S20
(ti((((((garden* OR horticulture OR allotment* OR botanical OR arboretum) NEAR/5 (maintain* OR creat* OR culivat* OR enhance* OR preserve OR voluntary OR volunteer OR conservation* OR participat*)))))) OR ab((((((garden* OR horticulture OR

allotment* OR botanical OR arboretum) NEAR/5 (maintain* OR creat* OR culivat* OR enhance* OR preserve OR voluntary OR volunteer OR conservation* OR participat*))))))) AND la.exact("English") AND pd(19900101-20121002)
Sociological Abstracts
59°
S21
(ti(((garden* OR horticulture OR allotment* OR botanical OR arboretum) NEAR/5 (kitchen OR school* OR college* OR university OR campus OR hospital* OR prison* OR penitentiary OR institution OR urban OR green* OR communit* OR communal OR group* OR guerrilla OR (bio NEAR/1 diver*) OR eco))) OR ab(((garden* OR horticulture OR allotment* OR botanical OR arboretum) NEAR/5 (kitchen OR school* OR college* OR university OR campus OR hospital* OR prison* OR penitentiary OR institution OR urban OR green* OR communit* OR communal OR group* OR guerrilla OR (bio NEAR/1 diver*) OR eco)))) AND la.exact("English") AND pd(19900101-20121002)
Sociological Abstracts
192°
S22
((ti((((((garden* OR horticulture OR allotment* OR botanical OR arboretum) NEAR/5 (maintain* OR creat* OR culivat* OR enhance* OR preserve OR voluntary OR volunteer OR conservation* OR participat*)))))) OR ab((((((garden* OR horticulture OR allotment* OR botanical OR arboretum) NEAR/5 (maintain* OR creat* OR culivat* OR enhance* OR preserve OR voluntary OR volunteer OR conservation* OR participat*))))))) AND la.exact("English") AND pd(19900101-20121002)) OR ((ti(((garden* OR horticulture OR allotment* OR botanical OR arboretum) NEAR/5 (kitchen OR school* OR college* OR university OR campus OR hospital* OR prison* OR penitentiary OR institution OR urban OR green* OR communit* OR communal OR group* OR guerrilla OR (bio NEAR/1 diver*) OR eco))) OR ab(((garden* OR horticulture OR allotment* OR botanical OR arboretum) NEAR/5 (kitchen OR school* OR college* OR university OR campus OR hospital* OR prison* OR penitentiary OR institution OR urban OR green* OR communit* OR communal OR group* OR guerrilla OR (bio NEAR/1 diver*) OR eco)))) AND la.exact("English") AND pd(19900101-20121002)) OR (SU.EXACT.EXPLODE("Gardens") AND SU.EXACT.EXPLODE("Conservation Education") AND la.exact("English") AND pd(19900101-20121002))
Sociological Abstracts
234°
S23
S20 or S21 or S22
Sociological Abstracts
234°
S24
(ti((((((communit* NEAR/5 (group* OR team* OR association* OR organisation OR organization OR participa* OR stakeholder* OR steward* OR trust* OR ranger* OR activit*)) AND (garden* OR allotment* OR forest OR (natural AND environment) OR conservation*)))))) OR ab((((((communit* NEAR/5 (group* OR team* OR association* OR organisation OR organization OR participa* OR stakeholder* OR steward* OR trust* OR ranger* OR activit*)) AND (garden* OR allotment* OR forest OR (natural AND environment) OR conservation*))))))) AND la.exact("English") AND pd(19900101-20121002)
Sociological Abstracts
329°
S25
(ti(((((communit* AND (work* OR renewal OR volunteer* OR voluntary OR practical OR regenerat* OR restor* OR maintain* OR care OR enhance* OR preserve OR creat* OR activ* OR action* OR involve*) AND ((natur* NEAR/3 environment*) OR (environmental* AND conservation*))))))) OR ab(((((communit* AND (work* OR renewal OR volunteer* OR voluntary OR practical OR regenerat* OR restor* OR maintain* OR care OR enhance* OR preserve OR creat* OR activ* OR action* OR involve*) AND ((natur* NEAR/3 environment*) OR (environmental* AND conservation*)))))))) AND la.exact("English") AND pd(19900101-20121002)
Sociological Abstracts
354°
S26

(ti(((((((communit* OR local) NEAR/5 (garden* OR park* OR green* OR greenspace OR outdoor* OR outside* OR pavement* OR sidewalk* OR wood* OR allotment* OR lake* OR canal* OR river*)) AND (work* OR renewal OR volunteer* OR voluntary OR practical OR participat* OR regenerat* OR restor* OR maintain* OR enhance OR preserve OR creat*)))))) OR ab(((((((communit* OR local) NEAR/5 (garden* OR park* OR green* OR greenspace OR outdoor* OR outside* OR pavement* OR sidewalk* OR wood* OR allotment* OR lake* OR canal* OR river*)) AND (work* OR renewal OR volunteer* OR voluntary OR practical OR participat* OR regenerat* OR restor* OR maintain* OR enhance OR preserve OR creat*)))))) AND la.exact("English") AND pd (19900101-20121002)
Sociological Abstracts
811°
S27
S24 or S25 or S26
Sociological Abstracts
1385°
S28
(ti(((Health* OR (quality NEAR/3 life) OR (well NEAR/3 being) OR wellbeing OR emotion*))) OR ab(((Health* OR (quality NEAR/3 life) OR (well NEAR/3 being) OR wellbeing OR emotion*)))) AND la.exact("English") AND pd(19900101-20121002)
Sociological Abstracts
91673*
S29
S10 and S28
Sociological Abstracts
134°
S30
S13 and S28
Sociological Abstracts
110°
S31
S16 and S28
Sociological Abstracts
58°
S32
S19 and S28
Sociological Abstracts
514°
S33
S23 and S28
Sociological Abstracts
48°
S34
S27 and S28
Sociological Abstracts
209°

Notes: The ProQuest interface could not successfully combine the search lines without crashing the search. Lines S29-S34 were individually downloaded and de-duplicated in Endnote.
File Saved: Soc Abs 1073.ris
Resource: Campbell Library
Searched: 3rd October 2012
Host: http://www.campbellcollaboration.org/Library/Library.php
environment* and Conservation* n=0

natur* and conservation* n=0
Conservation n=0
volunteer* n=1 (none included)
green gym n=0
garden* n=0
communi* n=8 (none included)

Resource: Database of promoting health effectiveness reviews (DoPHER)

Searched: 3rd October 2012
Host: EPPI (http://eppi.ioe.ac.uk/webdatabases/Intro.aspx?ID=2)

1. Freetext: Conservation n=2 (1 held for screening)
2. *Freetext: volunteer* n=4*
3. Freetext: voluntary n=25
4. Freetext: environment* n=139 (2 held for screening)
5. N=170

Results: 4 records taken forward for screening
From line1
NICE Public Health Collaborating Centre - Physical activity (10 November 2006) Physical activity and the environment. Review Three: Natural Environment: http://publications.nice.org.uk/physical-activity-and-the-environment-ph8/appendix-a-membership-of-the-programme-development-group-the-nice-project-team-and-external
From line 2
Fogelholm,M.; Lahti-Koski,M. (2002///) Community health promotion interventions with physical activity:does this approach prevent obesity? http://foodandnutritionresearch.net/index.php/fnr/article/viewFile/1457/1325
Lister-Sharp D, Chapman S, Stewart-Brown S, Sowden A (1999) Health promoting schools and health promotion in schools: two systematic reviews http://www.hta.ac.uk/execsumm/summ322.shtml

Resource: OpenGrey

Searched: 3rd October 2012
Host: EPPI (http://www.opengrey.eu/)

1. Freetext: Conservation
2. *Freetext: volunteer**
3. Freetext: voluntary
4. Freetext: environment*

Resource: The Trials Register of Promoting Health Interventions (TRoPHI)

Searched 3rd October 2012
Host: EPPI (http://eppi.ioe.ac.uk/webdatabases/Intro.aspx?ID=5)

1. Freetext: Conservation n=4
2. *Freetext: volunteer* n=42*
3. Freetext: voluntary n=47
4. Freetext: environment* n=187
5. N=280

Results: 0 records taken forward for screening

Appendix 4. List of organisations contacted

The Conservation Volunteers (BTCV)	Hush Farms
2020 Vision	Isle of Anglesey County Council
Aaron Pyecroft	Isle of Wight AONB

(*Continued*)

Active Wales	Isles of Scilly AONB
Age UK	Keep Britain Tidy, Beach Care
Ambios	Keep Wales Tidy
Arnside and Silverdale AONB	Kent Downs AONB
Avon Wildlife Trust	Kent High Weald Partners
Bailies of Bennachie	Kent nat tr vol
Basingstoke con vol	LANTRA
BeachCare (Keep Britain Tidy)	Lea Bridge con vol
Berkshire con vol	LEAF/Let nature feed your senses
B'ham Guild (Broader)	Leicester con vol
Biodiversity SW	Lincolnshire Wolds AONB
Biosphere CLS	Liverpool PCT
Birmingham Guild for Student Colunteers	Llyn Peninsula AONB
Blackdown Hills AONB	London and w/msex vol
Blackdown Hills Hedge Association	Lothian con vol
Blackwater Valley countryside volunteers	Love where you live
Bolton conservation vol	Malvern Hills AONB
Bolton Wildlife Programme	Manchester nat tr vol
Bournemouth nat tr vol	Marine Conservation Society
Bracknell con vol	Medway Valley Countryside Partnership
British Waterways	Mendip Hills AONB
BVSC (Birmingham)	MIND (Eco Minds)
Cambridge con vol	MoD
Camp Kernow	Moor Trees

(*Continued*)

Cannock Chase AONB	NAAONB
Canterbury Environmental Education Centre	Nat Eng Big Lottery projs
Cardiff con vol	National Parks
Carymoor Env trust	National Trust
Causeway Coast and Glens Heritage Trust	National Trust for Scotland
CCD	Natural England
Change Agents UK	Natural England
Chichester Harbour AONB	Naturally Active project - Kent
Chichester Harbour AONB Officer	Neroche
Chilterns Conservation Board	New Forest Volunteers
City Farms and Community Gardens	Newlands Project
Clwydian Range AONB	Newquay Zoo
CN4C	NHS Forest
CoAST	Nidderdale AONB
Coastnet	Norfolk Coast AONB Partnership
Community Environmental Trust	Norfolk nat tr vol
Community Payback	North Devon AONB
Confor SW	North Devon Council
Conservation Foundation	North East Wales Wildlife
Conservation Volunteers Australia	North Pennines AONB Partnership
Glasgow Con Vol	North Wessex Downs AONB
Cornwall AONB	Northumberland Coast AONB
Cornwall Council	OPAL
Cotswolds Conservation Board	Outdoor and Experiential Learning Group

(*Continued*)

Countryside Recreation Network	Outdoor health forum
Countryside Trust	Oxford cons vol
Cove Brook Greenway group	Oxford Urban Wildlife Group
Coventry nat tr vol	Pembroke 21C
CPRE	People and Planet
Cranborne Chase and West Wiltshire Downs AONB	Plantlife International
CRCC	Plymouth Environmental Action
CRESH	Plymouth Student Scientist
CSV	PROSPECTS
Cusgarne Organic Farm	Quantock Hills AONB
CVS	Reforesting Scotland
Dartmoor Preservation Association	Rowhill con vol
Dean Green Team Volunteers	Royal Horticultural Society
Dedham Vale AONB and Stour Valley Project	RSPB
Derbyshire con vol	Scarborough con vol
DofE	Scottish Wildlife Trusts
Dorset AONB Partnership	Scouts
Durham Uni con vol	SeaSchool
Durlston Volunteers	Sheffield W'experience programmes
Earth Trust	Shropshire Hills AONB
East Devon AONB Partnership	Silvanus Trust
Egham/Staines con vol	Small Woods Association
Environment Kernow	SNCV (Sutton)
Epping forest con vol	SNH

(*Continued*)

Europarc	Snowdonia Society
FEVA	Solway Coast AONB
Fleet Pond Soc	Somerset Community Food
Forest of Bowland AONB	South Devon AONB Partnership
Forest Research	South Down National Park
Forest School	South West Environmental Action Trust
Forestry Commission	South West Lakes Trust
Forestry Commission Scotland	South West London Environment Network
Forum for Environmental Volunteering Activity	Steeple Woodland Reserve
Friends of Par Beach	Suffolk Coast & Heaths AONB Partnership
Friends of the earth	Surfers Against Sewage
Frimley Fuel Allot con team	Surrey Hills AONB
Froglife	Sustrans
Gibbonsdown and Court Partnership	Tamar Valley AONB Partnership
Glentress Trail Fairies	Teignbridge vols
Global Boarders	TFL volunteers
Gloucester vale con vol	Thames 21
Gower AONB	The Mendip Society
Green Space Community Network	THRIVE
Green Team	Venture Scotland
Greener Ilfracombe	vInspired
Greenham and Crookham con vol	Volunteer Bristol
Greenpeace Cornwall	Volunteer Cornwall
Groundwork	Volunteer development Scotland

(*Continued*)

Guernsey con vol	Wandle Trust
Haldon Forest Volunteers	Wednesday con vol
Haldon4Horses	West Country Rivers Trust
Hampshire con vol	Wicken Fen con vol
Harlow con vol	Wildlife Trust
Haven Holidays	Wirral county vols
High Weald AONB JAC	Woodland Trust
Highland Environmental Network	Wychwood Project
Hill Holt Wood	Wycombe District Council
Howardian Hills AONB	Wye Valley AONB

Appendix 5. Website hand searches

Terms:

1. Environment;
2. Conservation;
3. (1) and (2);
4. Environmental enhancement;
5. Volunteering; and
6. Health/well-being.

Website URL	Website Name
http://www.dtic.mil/whs/directives/index.html	US Military DoD
http://www.ccw.gov.uk/default.aspx	Countryside Council for Wales
http://www.tsrc.ac.uk/	Third Sector Research
http://www.vssn.org.uk/	Voluntary Sector Studies Network - Journal
http://www.ivr.org.uk/ivr-evidence-bank?q=&t%5B%5D=362	Institute for Volunteer Research
http://www.naturaleconomynorthwest.co.uk/	Natural Economy North West
http://www.oecd-ilibrary.org/;jsessionid=136d54v2tehqa.delta	OECD iLibrary

(*Continued*)

http://www.oecd.org/department/0,3355,en˙2649˙33713˙1˙1˙1˙1˙1,00.html	OECD Environmental Directorate
http://www.epa.gov/	US Environmental Protection Agency
http://hero.epa.gov/index.cfm	Health and Environmental Research Online - US
http://www.eea.europa.eu/	European Environment Agency
http://www.npca.org/	US National Parks Conservation
http://www.environment.gov.au/	Australian Environment Agency
http://www.ec.gc.ca/default.asp?lang=en	Environment Canada
http://www.npws.ie/	Ireland Parks
http://www.epa.ie/	Environmental Protection Ireland
http://www.doeni.gov.uk/niea/	Dept of Env Ireland
http://www.epa.govt.nz/Pages/default.aspx	NZ EPA
http://www.doc.govt.nz/publications/	NZ Conservation Authority
http://www.forestry.gov.uk/publications	Forestry Commission
http://www.forestry.gov.uk/forestresearch	Forest Research
http://www.snh.gov.uk/publications-data-and-research/	Scottish Natural Hertitage
http://www.feva-scotland.org/display/library	FEVA
http://publications.naturalengland.org.uk/	Natural England
http://www.sehn.org/	Science and Environmental Health Network
http://www.sustainweb.org/publications/	Sustain Web
http://www.fph.org.uk/policy%2c˙publications˙and˙events	Faculty of Public Health College - London
http://www.carefarminguk.org/case-studies.aspx	Care Farming UK
http://www.mod.uk/DefenceInternet/MicroSite/DIO/OurPublications/EstateAndSustainableDevelopment/Sanctuary.htm	Sanctuary Magazine, MoD UK

(*Continued*)

http://www.hphpcentral.com	International 'healthy parks healthy people' network
http://www.ecohealth.net	International association for ecology and health
http://www.ramsar.org/cda/en/ramsar-pubs/main/ramsar/1-30˙4000˙0˙˙	Healthy wetlands and healthy people initiative of Ramsar Convention on Wetlands
http://www.cbd.int/	Healthy planet healthy people initiative of the convention on biodiversity
www.saveourseine.com/	Save our Seine
http://www.landcareonline.com/; http://www.landcareonline.com.au/?page˙id=9608	Landcare online

Appendix 6. Tools for critical appraisal

The Cochrane Collaboration's tool for assessing risk of bias

Domain	Description	Review authors' judgement
Sequence generation.	Describe the method used to generate the allocation sequence in sufficient detail to allow an assessment of whether it should produce comparable groups	Was the allocation sequence adequately generated?
Allocation concealment.	Describe the method used to conceal the allocation sequence in sufficient detail to determine whether intervention allocations could have been foreseen in advance of, or during, enrolment	Was allocation adequately concealed?
Blinding**of participants, personnel and outcome assessors** *Assessments should be made for each main outcome (or class of outcomes).*	Describe all measures used, if any, to blind study participants and personnel from knowledge of which intervention a participant received. Provide any information relating to whether the intended blinding was effective	Was knowledge of the allocated intervention adequately prevented during the study?
Incomplete outcome data *Assessments should be made for each main outcome (or class of outcomes).*	Describe the completeness of outcome data for each main outcome, including attrition and exclusions from the analysis. State whether attrition and exclusions were reported, the numbers in each intervention	Were incomplete outcome data adequately addressed?

(*Continued*)

	group (compared with total randomized participants), reasons for attrition/exclusions where reported, and any re-inclusions in analyses performed by the review authors	
Selective outcome reporting.	State how the possibility of selective outcome reporting was examined by the review authors, and what was found	Are reports of the study free of suggestion of selective outcome reporting?
Other sources of bias.	State any important concerns about bias not addressed in the other domains in the tool If particular questions/entries were prespecified in the review's protocol, responses should be provided for each question/entry	Was the study apparently free of other problems that could put it at a high risk of bias?

Derived from Higgins 2011

EPHPP quality assessment tool (quantitative studies)

EPHPP quality assessment tool (quantitative studies)	EPHPP quality assessment tool for quantitative studies dictionary
A. Selection bias	
(Q1) Are the individuals selected to participate in the study likely to be representative of the target population?	Participants are more likely to be representative of the target population if they are randomly selected from a comprehensive list of individuals in the target population (score very likely). They may not be representative if they are referred from a source (e.g. clinic) in a systematic manner (score somewhat likely) or self-referred (score not likely)
(Q2) What percentage of selected individuals agreed to participate?	Refers to the % of subjects in the control and intervention groups that agreed to participate in the study before they were assigned to intervention or control groups
B. Study design	
Indicate the study design.	In this section, raters assess the likelihood of bias due to the allocation process in an experimental study. For observational studies, raters assess the extent that assessments of exposure and outcome are likely to be independent. Generally, the type of design is a good indicator of the extent of bias. In stronger designs, an equivalent control group is present and the allocation process is such that the investigators are unable to predict the sequence

(*Continued*)

Was the study described as randomized?	Score YES, if the authors used words such as random allocation, randomly assigned, and random assignment Score NO, if no mention of randomization is made.
If Yes, was the method of randomization described?	Score YES, if the authors describe any method used to generate a random allocation sequence Score NO, if the authors do not describe the allocation method or describe methods of allocation such as alternation, case record numbers, dates of birth, day of the week, and any allocation procedure that is entirely transparent before assignment, such as an open list of random numbers of assignments If NO is scored, then the study is a controlled clinical trial
If Yes, was the method appropriate?	Score YES, if the randomization sequence allowed each study participant to have the same chance of receiving each intervention and the investigators could not predict which intervention was next. Examples of appropriate approaches include assignment of subjects by a central office unaware of subject characteristics, or sequentially numbered, sealed, opaque envelopes Score NO, if the randomization sequence is open to the individuals responsible for recruiting and allocating participants or providing the intervention, since those individuals can influence the allocation process, either knowingly or unknowingly If NO is scored, then the study is a controlled clinical trial
C. Confounders	
(Q1) Were there important differences between groups prior to the intervention?	By definition, a confounder is a variable that is associated with the intervention or exposure and causally related to the outcome of interest. Even in a robust study design, groups may not be balanced with respect to important variables prior to the intervention. The authors should indicate if confounders were controlled in the design (by stratification or matching) or in the analysis. If the allocation to intervention and control groups is randomized, the authors must report that the groups were balanced at baseline with respect to confounders (either in the text or a table) The review group assessed differences between groups at baseline based on age, sex and diagnosis, and assigned 'can't tell' where there was insuffucient information to assess or the sample sizes were too small
(Q2) If yes, indicate the percentage of relevant confounders that were controlled (either in the design (e.g. stratification, matching) or analysis?	
D. Blinding	
(Q1) Was (were) the outcome assessor(s) aware of the intervention or exposure status of participants?	Assessors should be described as blinded to which participants were in the control and intervention groups. The purpose of blinding the outcome assessors (who might also be the care providers) is to protect against detection bias

(*Continued*)

(Q2) Were the study participants aware of the research question?	Study participants should not be aware of (i.e. blinded to) the research question. The purpose of blinding the participants is to protect against reporting bias
E. Data collection methods	
(Q1) Were data collection tools shown to be valid?	Tools for primary outcome measures must be described as reliable and valid. If 'face' validity or 'content' validity has been demonstrated, this is acceptable. Some sources from which data may be collected are described below: Self-reported data includes data that is collected from participants in the study (e.g. completing a questionnaire, survey, answering questions during an interview, etc.) Assessment/Screening includes objective data that is retrieved by the researchers. (e.g. observations by investigators) Medical Records/Vital Statistics refers to the types of formal records used for the extraction of the data The review group assessed tool through chasing published references detailing validation assessment, so is an author assessment
(Q2) Were data collection tools shown to be reliable?	
F. Withdrawals and drop-outs	
(Q1) Were withdrawals and drop-outs reported in terms of numbers and/or reasons per group?	Score YES if the authors describe BOTH the numbers and reasons for withdrawals and drop-outs Score NO if either the numbers or reasons for withdrawals and drop-outs are not reported The percentage of participants completing the study refers to the % of subjects remaining in the study at the final data collection period in all groups (i.e. control and intervention groups)
(Q2) Indicate the percentage of participants completing the study. (If the percentage differs by groups, record the lowest)	
G. Intervention integrity	
(Q1) What percentage of participants received the allocated intervention or exposure of interest?	The number of participants receiving the intended intervention should be noted (consider both frequency and intensity). For example, the authors may have reported that at least 80 percent of the participants received the complete intervention. The authors should describe a method of measuring if the intervention was provided to all participants the same way. As well, the authors should indicate if subjects received an unintended intervention that may have influenced the outcomes. For example, co-intervention occurs when the study group receives an additional intervention (other than that intended). In this case, it is possible that the effect of the intervention may be over-estimated. Contamination refers to situations where the control group accidentally receives the study intervention. This could result in an under-estimation of the impact of the intervention
(Q2) Was the consistency of the intervention measured?	
(Q3) Is it likely that subjects received an unintended intervention (contamination or co-intervention) that may influence the results?	
H. Analyses	

(*Continued*)

(Q1) Indicate the unit of allocation	Was the quantitative analysis appropriate to the research question being asked? An intention-to-treat analysis is one in which all the participants in a trial are analysed according to the intervention to which they were allocated, whether they received it or not. Intention-to-treat analyses are favoured in assessments of effectiveness as they mirror the noncompliance and treatment changes that are likely to occur when the intervention is used in practice, and because of the risk of attrition bias when participants are excluded from the analysis
(Q2) Indicate the unit of analysis	
(Q3) Are the statistical methods appropriate for the study design?	
(Q4) Is the analysis performed by intervention allocation status (i. e. intention to treat) rather than the actual intervention received?	
Component Ratings of Study:	For each of the six components A - F, use the following descriptions as a roadmap
A) Selection bias	Strong: The selected individuals are very likely to be representative of the target population (Q1 is 1) and there is greater than 80% participation (Q2 is 1) Moderate: The selected individuals are at least somewhat likely to be representative of the target population (Q1 is 1 or 2); and there is 60 - 79% participation (Q2 is 2). 'Moderate' may also be assigned if Q1 is 1 or 2 and Q2 is 5 (can't tell) Weak: The selected individuals are not likely to be representative of the target population (Q1 is 3); or there is less than 60% participation (Q2 is 3) or selection is not described (Q1 is 4); and the level of participation is not described (Q2 is 5)
B) Design	Strong: will be assigned to those articles that described RCTs and CCTs Moderate: will be assigned to those that described a cohort analytic study, a case control study, a cohort design, or an interrupted time series Weak: will be assigned to those that used any other method or did not state the method used
C) Confounders	Strong: will be assigned to those articles that controlled for at least 80% of relevant confounders (Q1 is 2); or (Q2 is 1) Moderate: will be given to those studies that controlled for 60 - 79% of relevant confounders (Q1 is 1) and (Q2 is 2) Weak: will be assigned when less than 60% of relevant confounders were controlled (Q1 is 1) and (Q2 is 3) or control of confounders was not described (Q1 is 3) and (Q2 is 4)
D) Blinding	Strong: The outcome assessor is not aware of the intervention status of participants (Q1 is 2); and the study participants are not aware of the research question (Q2 is 2) Moderate: The outcome assessor is not aware of the intervention status of participants (Q1 is 2); or the study participants are not aware of the research question (Q2 is 2); or blinding is not described (Q1 is 3 and Q2 is 3) Weak: The outcome assessor is aware of the intervention status of

(*Continued*)

	participants (Q1 is 1); and the study participants are aware of the research question (Q2 is 1)
E) Data collection methods	Strong: The data collection tools have been shown to be valid (Q1 is 1); and the data collection tools have been shown to be reliable (Q2 is 1) Moderate: The data collection tools have been shown to be valid (Q1 is 1); and the data collection tools have not been shown to be reliable (Q2 is 2) or reliability is not described (Q2 is 3) Weak: The data collection tools have not been shown to be valid (Q1 is 2) or both reliability and validity are not described (Q1 is 3 and Q2 is 3) [Note: validation of tools was assessed by the review team through references given in studies]
F) Withdrawals and drop-outs	Strong: will be assigned when the follow-up rate is 80% or greater (Q2 is 1) Moderate: will be assigned when the follow-up rate is 60 - 79% (Q2 is 2) OR Q2 is 5 (N/A) Weak: will be assigned when a follow-up rate is less than 60% (Q2 is 3) or if the withdrawals and drop-outs were not described (Q2 is 4)
Global rating for this paper (circle one):	1 STRONG (no WEAK ratings) 2 MODERATE (one WEAK rating) 3 WEAK (two or more WEAK ratings) With both reviewers discussing the ratings: Is there a discrepancy between the two reviewers with respect to the component (A-F) ratings? If yes, indicate the reason for the discrepancy
Final decision of both reviewers (circle one):	1 Strong 2 Moderate 3 Weak

Wallace criteria

1	**Question**	Is the research question clear?	E
2	**Theoretical Perspective**	Is the theoretical or ideological perspective of the author (or funder) explicit, and has this influenced the study design, methods or research findings?	D

(*Continued*)

3	**Study Design**	Is the study design appropriate to answer the question?	E
4	**Context**	Is the context or setting adequately described?	
5	**Sampling**	(Qualitative) Is the sample adequate to explore the range of subjects and settings, and has it been drawn from an appropriate population? (Quantitative) Is the sample size adequate for the analysis used and has it been drawn from an appropriate population?	E
6	**Data Collection**	Was the data collection adequately described and rigorously conducted to ensure confidence in the findings?	E
7	**Data Analysis**	Was there evidence that the data analysis was rigorously conducted to ensure confidence in the findings?	E
8	**Reflexivity**	Are the findings substantiated by the data and has consideration been given to any limitations of the methods or data that may have affected the results?	D
9	**Generalisability**	Do any claims to generalisability follow logically, theoretically and statistically from the data?	D
10	**Ethics**	Have ethical issues been addressed* and confidentiality respected?	D

E = essential, D = desirable, * Ethics may be essential in other sensitive fields

CONTRIBUTIONS OF AUTHORS

KH was the lead reviewer and provided day-to-day management of the project. RL was co-reviewer and screened, appraised, extracted, and approved the final synthesis of the review. CC developed the search strategy and conducted bibliographic searches. WST provided information graphic support and produced the final version of the conceptual framework. KH and RL drafted the final report and all authors provided critical feedback and approved the final version. RG was the project lead and provided senior leadership throughout.

DECLARATIONS OF INTEREST

RL previously worked with and for the co/authors (Dr Elizabeth O'Brien and Claudia Carter) of a number of the studies included in the review, though had no involvement with the included studies themselves.

There are no competing interests from any of the remaining review team.

SOURCES OF SUPPORT

Internal sources

- University of Exeter, UK.

Internal salary support

External sources

- National Institute for Health Research (NIHR) School for Public Health Research (SPHR), UK.

Salary support (all research staff) and other research costs

- National Institute for Health Research Collaborations for Leadership in Applied Health Research and Care, UK.

Partial salary support (RG)

- European Regional Development Fund, UK.

Partial salary support (RG)

- European Social Fund Convergence Programme for Cornwall and the Isles of Scilly, UK.

Partial salary support (RG)

DIFFERENCES BETWEEN PROTOCOL AND REVIEW

- We have clarified in the full report that we included prospective and retrospective cohort studies in the review, which was not specified in the protocol.

- We were unable to include searches from IBSS as we lost access to it prior to searching.

- We have stated the confounders we anticipated: mental health status; age; socio-economic status; gender; ethnicity; and intervention programme characteristics.

- We had planned to group studies by both 1) type of environmental enhancement activity used and 2) theoretical background. However, heterogeneity in the evaluation methodology used in studies, as well as insufficient reporting detail in the small number of included studies, meant grouping by intervention was not helpful. Also given the uncritical application of major theories (see Risk of bias in included studies), no meaningful grouping by theoretical background could be undertaken. The similarity of the reported activities (e.g. motivation to improve environment; group-based; and small-scale environmental change) undertaken by participants meant that all included studies fell under the broad heading of EECA, as defined through on-going discussions with the PRG, and were therefore synthesised narratively.

- We derived an overall assessment score, similar to the EPHPP global rating, using the Wallace criteria (Wallace 2004). Where all essential criteria were met, and seven 'desirable' questions were answered positively, we graded qualitative studies 'good', between four and six 'desirable' positive answers we graded 'moderate' and nought to three we graded 'poor'. Any studies not meeting the 'essential' criteria we also graded as 'poor'.