What are the health benefits of taking part in environment/conservation activities for different groups of people? A theory led systematic review

1.	**Project reference:**	**Final report date:**	
	SPHR-PEN-PH1-ECA	September 2013	
2.	**Project title:**		
	What are the health benefits of taking part in environment/conservation activities for different groups of people? A theory led systematic review		
3.	**Lead investigator(s) on project:**		
	Ruth Garside, Senior Lecturer in Evidence Synthesis, University of Exeter Medical School		
	Other NIHR School collaborators (name, School for Primary Care/Social Care Research) on project:		
	N/A		
	Names and roles of others involved in project (e.g. include fixed term contract researchers and external collaborators / partners):		
	Kerryn Husk, Rebecca Lovell, Chris Cooper - Exeter The following people from collaborating SPHR centres are part of an Expert Advisory Group: Mark Petticrew (LSHTM), Liddy Goyder, Sue Baxter (University of Sheffield; ScHARR), Clare Bambra (Fuse; Durham University), Mima Cattan (Fuse; Northumbria University). Representatives from the following organisations formed a project Reference Group: MIND (Ken Ryan), Natural England (Rachael Penney), Conservation Volunteers (Adam Slater), Small Woods (Angela Pollard), DEFRA (Ed Dyson), N. Penines AONB (Chris Woodley Stewart), Groundwork (Katie Stephens), The Conservation Foundation (Lindsay Swan).		
4.	**Project start date:**	**Project end date:**	**Duration:**
	16th April 2012	15th April 2013	12 months
5.	**Project objectives originally outlined in proposal:**		
	Research Questions This project aimed to understand: • What are the health impacts of taking part in environmental enhancement/ conservation activities for different groups of people? • How do these projects achieve these benefits? • Are there particular impacts on different groups of people? • What are the contextual factors that contribute to differing impacts? **Objectives** To conduct a systematic review and synthesis of the quantitative and qualitative research evidence in order to understand how and why involvement with outdoor activities, which also		

	enhance the natural environment, impacts on people's health and well-being. As well as assessing what is known about what these impacts might be, we also sought to understand how these activities have these effects, in what circumstances, and for whom, through the development and, where data are available, the evaluation of a logic model which describes the nature, and potential interactions, of these benefits.
6.	**Briefly describe and explain the reason(s) for any changes to the project originally outlined in proposal:**
	We registered a version of the proposal with the Cochrane Public Health Group, however, the proposed theory led part of the review was not considered appropriate in the Cochrane paradigm. They also wanted the review to be about impact on adults only. The Cochrane review therefore represents a more traditional mixed methods synthesis of the quantitative and qualitative research on the topic, with the conceptual model showing the proposed mechanisms of affect, which is based on the qualitative evidence, and the input of the PRG, seen by Cochrane as proposed interpretation of the project (see figure 1 below). The final step of the project – which treats this model as a key outcome of the initial review (the development of theories of action) and builds on it to try and populate the model to establish the evidence for the proposed mechanisms, is part of an additional publication. The dual aims of the project have, therefore, been met but they are separated into a Cochrane review and additional theory led work for a separate publication.
7.	**Brief summary of methods, findings against objectives, and conclusions (2-4 pages max):**
	We used a range of methods to identify relevant literature. Notably, in addition to database searches, extensive contact with relevant organisations was used to identify relevant grey literature. The grey literature search identified 211 unique items which were located and screened at full-text. The database searches identified 16,562 unique records (and citation chasing, 11), with 16,463 excluded at title and abstract. A total of 321 items were screened at full text. Twenty-one studies were included in the analysis, reported in 30 papers: three case-control studies, one cohort study, five uBAs, three mixed-method studies (uBAs and qualitative elements), and nine qualitative studies. A total of 3,605 participants were examined across 20 studies reporting sample size (2,978 from quantitative studies (one using routine data covering a large population), 190 from qualitative studies (with one not reporting sample size), and 437 from mixed-methods studies). No new quantitative studies were identified through database searches over grey literature searching and author contacts, though additional reports relating to already included studies were located. Included studies consisted of a wide range of EECA interventions which were, overall, poorly reported. The resulting lack of detailed comparability meant results from studies were best synthesised narratively. Included quantitative studies were, apart from one, rated as having a high risk of bias on the EPHPP scale. Studies were rated poorly due to: study design, intervention detail, participant selection and reporting, outcome reporting and blinding. Qualitative studies were rated more highly, with studies being criticised for a lack of detail around participants, methods and intervention descriptions. Given the poor quality of the included studies there is little reliable evidence of any impact of EECA on health and well-being in adults. There are limited indications from the quantitative data that there is the potential for positive or negative impacts on physical or mental health, but the underlying mechanisms remain unclear (largely due to insufficient reporting detail). Positive associations were reported in six studies across primary outcomes: physiological, mental and emotional health, and quality of life. No studies were identified which included physical health outcomes. Negative associations were reported in five studies. One quantitative study reported higher levels of anxiousness in the land management group, another quantitative study reported an increase in mental health stress as measured on SF-

36. Three qualitative studies reported negative associations, firstly around recruitment and retention into programmes, secondly participants reporting an informed futility at the lack of impact programmes had, and thirdly reports of insufficient input to change the environment.

Participant selection and characteristics were poorly described in studies which were often evaluation reports for projects. There was a lack of detail around differentiation in outcome based on characteristics identified in the protocol: gender (only one study reported data), age (again, only one study), and socio-economic status (no studies reported data). Data were provided relating to referral status (three studies) and mental ill health status (five studies), though differences were rarely reported between the groups in quantitative studies.

Included qualitative evidence provided richer and more detailed descriptions of mechanisms of change. Thematic analysis of the data resulted in 10 themes being identified relating to participants' experience (personal & social identity; physical activity; physical restoration; developing knowledge; spirituality; benefits of place; personal achievement; psychological benefits; social contact; risks and negative impacts). These themes, representing "everyday theories" about how taking part in activities that enhance the environment, are thought to have an impact on health and wellbeing, formed a key source of information in creating our conceptual framework. This framework illustrates the complex ways in which activity, environment and participants may interact to produce an impact. This was also developed in conjunction with our reference groups. Through multiple iterations we sought to illustrate the ways in which mechanisms might constitute a complex pathway to health and well-being. The resulting model, whilst detailed, is applicable to similar activities (such as gardening, farm-care, horticulture therapy) and demonstrates the important elements identified (including participant motivation, structure of activities) linking EECA with health and well-being.

We found high level evidence of positive impacts on health and well-being for: physical activity; achievement and contribution and social contact; and weaker evidence for the impact of engagement with natural environments. The mechanisms through which these activities may affect health and wellbeing are multiple and complex. Our model also suggests that those with fewer outlets for personal achievement and social contact may have the potential to benefit most from these activities.

8. Plain English Summary (400 words max)
Please provide a summary of the project, including background, findings and conclusions:

Contact with the environment is thought to have a range of impacts on our health and well-being, from better mental health amongst those living closer to green spaces to providing a place for healthy activities such as walking or cycling. Recognising these opportunities there has recently been a rise in projects which aim to use the environment as a means to improve individuals' health and well-being. Environmental enhancement or conservation activities are one way in which this is being achieved, and are those in which the aim is to benefit health through active participation in environmental improvements.

We found 21 quantitative (based on numerical data) and qualitative (based on text from interviews) studies from the UK, Canada and Australia which had assessed whether taking part in environmental enhancement and conservation activities might improve health and well-being in adults.

The quality of the available evidence was not sufficient to draw reliable conclusions, and the majority of the studies reported no effect on health and well-being outcomes. However there was limited evidence that participation had positive effects on individuals' self-reported health, quality of life and physical activity levels, but also some evidence reporting that participation led to increased mental fatigue and greater feelings of anxiety. The results of the studies need to be treated with caution because the research methods used were not very robust (i.e. they could not show definitively that participation caused any health change) and because the reporting of how the activities and the research were undertaken was inconsistent and lacking in crucial detail.

	The more detailed descriptions from the qualitative studies illustrate the experience of people taking part which may impact on health and well-being. Factors included: increased social contact (particularly for socially isolated individuals such as those experiencing mental ill health), opportunities for feeling a sense of achievement, experience of the natural world, and the provision of daily structure. Given the quality of the evidence, we are unable to draw any definite conclusions about the impacts of environmental enhancement activity. 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.
9.	**Keywords** **Please provide up to 8 keywords that relate to the research undertaken in this study:**
	Environmental enhancement, health and wellbeing, systematic review
10.	**Dissemination – please detail planned or published articles in peer-reviewed journals (including web links):**
	Articles and reports Husk K, Lovell R, Cooper C, Stahl-Timmins W, Garside R. Participation in environmental enhancement and conservation activities for health and well-being in adults: a review of quantitative and qualitative evidence. Cochrane Database of Systematic Reviews (2016). DOI: 10.1002/14651858.CD010351.pub2 https://goo.gl/uXDFiW Lovell R, Husk K, Cooper C, Stahl-Timmins W, Garside R. *Understanding how environmental enhancement and conservation activities may benefit health and wellbeing: a systematic review.* BMC Public Health (2015) **15**:864 doi:10.1186/s12889-015-2214-3 https://goo.gl/mHzXaD Briefing document for public health practitioners: *What are the health benefits of taking part in environment/conservation activities for different groups of people? A theory led systematic review.* (briefing) *Naturally Healthy: Improving Engagement with Our Natural Environment Behaviour Change Scoping Report,* Devon Local Nature Partnership & Public Health Devon, Jul 2014 http://bit.ly/1yrnBwD (featured in scoping paper) Husk K, Lovell R, Cooper C, Garside R. *Participation in environmental enhancement and conservation activities for health and well-being in adults (Protocol).* Cochrane Database of Systematic Reviews 2013, Issue 2. Art. No.: CD010351. DOI: 10.1002/14651858.CD010351. https://goo.gl/3HUi9J Bragg R, Wood C, Barton J. *Ecominds effects on mental wellbeing – an evaluation for Mind.* (2013) http://bit.ly/1dlDxCx (featured in report) Conference abstracts Lovell R, Husk K, Cooper C, Stahl-Timmins W, Garside R. *Environmental conservation activities for health: building on systematic review methods to consider a disparate, dispersed, and limited evidence base*. Public Health Science Conference (The Lancet), Glasgow, 19 Nov 2014. The Lancet, 384, S46 doi:10.1016/S0140-6736(14)62172-3 Conference presentations Husk K, Lovell B, Cooper C, Stahl-Timmins W, Garside R *Using and extending a mixed-method theory based systematic review approach where available intervention evidence is*

	hard to reach, low volume and of low quality. Evidence Live, Oxford, 13th – 14th April 2015. (poster) Husk K, Lovell B, Cooper C, Stahl-Timmins W, Garside R. *What are the health and wellbeing impacts of participating in environmental enhancement? A theory-led systematic review.* NIHR SPHR Annual Scientific Meeting, London, 8 Oct 2013. Lovell, R. Husk, K., Cooper, C, and Garside, R. *Using a theory driven mixed-method review to assess the benefits of complex environmental-health programmes. Cochrane Public Health Group review CD010351.* 21st Cochrane Colloquium, Québec City, 19-23 Sept 2013. (poster) Lovell R, Husk K, Cooper C, Garside R. *A theory led-systematic review of the health and wellbeing impacts of participating in environmental enhancement and conservation activities.* XVth International Symposium in Medical/Health Geography. East Lansing, Michigan. 7 – 12 Jul 2013 Garside, R., Husk, K., Lovell, R. and Cooper, C. (2013). *What are the health and wellbeing impacts of participating in environmental enhancement activities? A systematic review of the quantitative and qualitative evidence.* Environmental Health 2013. Boston, MA. 3-6 March 2013 Garside R, Husk K, Lovell B, Cooper C. *What are the health and well-being impacts of participating in environmental enhancement activities: a systematic review.* NIHR SPHR Annual Scientific Meeting, Sheffield, 10 Oct 2012. Husk K, Lovell R, Cooper C, Garside R. *The health and wellbeing impacts of participating in environmental enhancement/conservation activities: a systematic review of quantitative and qualitative evidence.* NIHR SPHR Annual Scientific Meeting, Sheffield, 10 Oct 2012. (poster) <u>Seminars and workshops</u> Lovell, R. Husk, K., Cooper, C, and Garside, R. *Systematic review of green space and health.* Healthy Landscapes Symposium, London Green Infrastructure Week. London. 30 Apr, 2014. (presentation) Lovell B. *Systematic review of green space and health.* National Parks and Wildlife as Natural Health Service Providers conference. North Wales, 9 Apr 2014. (presentation) Husk K, Lovell R, Cooper C, Garside R. *What are the health benefits of taking part in environment/ conservation activities for different groups of people? A theory led systematic review* 'Growing the Evidence' research symposium. Taunton, 16 Oct 2012. (presentation)
11.	**Public and participant involvement** **Please provide comment on your experiences, any changes made and lessons drawn:**
	Our key practitioner engagement was through the project reference group involvement (members above) who met twice in the course of the project and contributed to considering the ways in which participation are thought to impact on physical and mental health and wellbeing, and also to the development of a 2-page briefing document describing the findings for dissemination to practitioners. This model was very successful as it allowed ongoing consultation with relevant groups.
12.	**What impact has the research already achieved or what might it achieve? (i.e. policy, practice, academic):**
	1. With input from our project reference group, we produced a 2 page summary about the report to be distributed to relevant groups in primary care, mental health

	teams, and those engaged in organising such activities. 2. As well as existing outputs above, the systematic review has been published in the Cochrane Library; 3. The full review, including targeted searches, has been published by BMC Public Health; 4. Results presented at both: National Parks and Wildlife as Natural Health Service Providers, Snowdonia, 2014; and Healthy Landscapes, London Green Infrastructure Week, London, 2014; and Growing the evidence - Taunton, 2013. 5. Conceptual model and review summary included in the EcoMinds report by Mind and Essex Sustainability Institute; and the Naturally Healthy Scoping Report by Devon Local Nature Partnership.

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