VALUING NATURE PROGRAMME

Valuing Nature Programme Report No. 1

Identifying Priorities for the Health & Wellbeing Funding Call: Results from Web Survey

May 2015

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The Valuing Nature Programme aims to better understand and represent the complexities of the natural environment in valuation analyses and decision making, by considering the economic, societal and cultural value of ecosystem services. A Programme Coordination Team is running events and activities to help build an interdisciplinary research community capable of working across the natural, biological and social sciences, and the arts and humanities, and to build strong links with research users through the Valuing Nature Network.

Identifying Priorities for the Health and Wellbeing Funding Call: Results from Web Survey

Introduction

The Valuing Nature Programme Coordination Team (VNPCT) ran a web survey as part of an engagement process to help to help identify research priorities for the planned 'Health & Wellbeing' funding call. This funding call is part of the Valuing Nature Programme, which aims to better understand and represent the complexities of the natural environment in valuation analyses and decision making. Further details are available on the Valuing Nature website (valuing-nature.net).

The results of the web survey are given in this report. The survey was open from 20 February to 13 March 2015. The questions asked in the survey are listed in Annex A.

Responses to the web survey were also used at a workshop about research priorities for the call. The workshop was held at the Royal Society on 20 March 2015. It was attended by 48 people who represented a diverse range of academic disciplines and included end-users of research from policy and practice.

A "thinkpiece" (Annex B) was prepared to stimulate responses to the survey and workshop, and the survey was promoted via Valuing Nature communications channels and by the three research councils planning to fund the research call: the Natural Environment Research Council, the Economic and Social Research Council and the Arts and Humanities Research Council.

The reports from the web survey and workshop were shared with funders to use in defining the content of the Health and Wellbeing funding call.

The focus of the call was defined as improving understanding of the role biodiversity and ecosystem services play in human health & wellbeing for four specific topics: natural hazards & extreme events, vector borne disease, marine toxins, and urban ecosystems (greenspace). Projects funded by the call would need to deliver a step change in understanding of valuation (monetary and / or non-monetary) and help develop interdisciplinary research capability.

The web survey asked respondents to identify key research areas / challenges for each of the three topics and for the cross cutting area of interdisciplinary research. Responses are summarised below, organised into the sub-categories identified at the workshop. Full responses are given in Annex C.

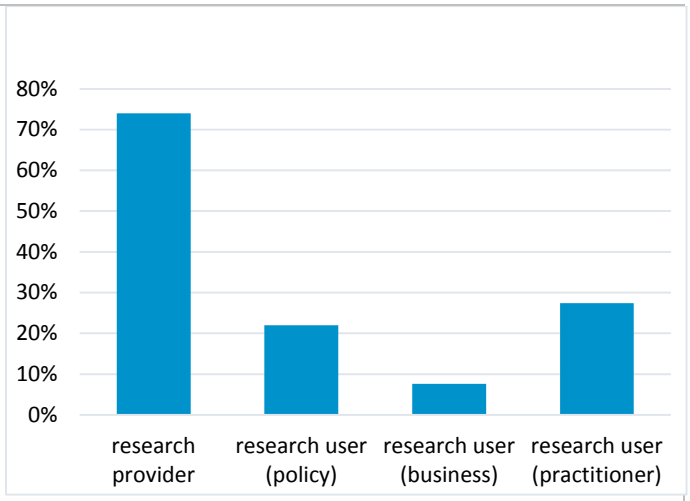
Respondents were also asked to identify opportunities for them to work with potential projects. Responses are listed in Annex D, and will be used in promoting partnerships for the funding call.

About the responses

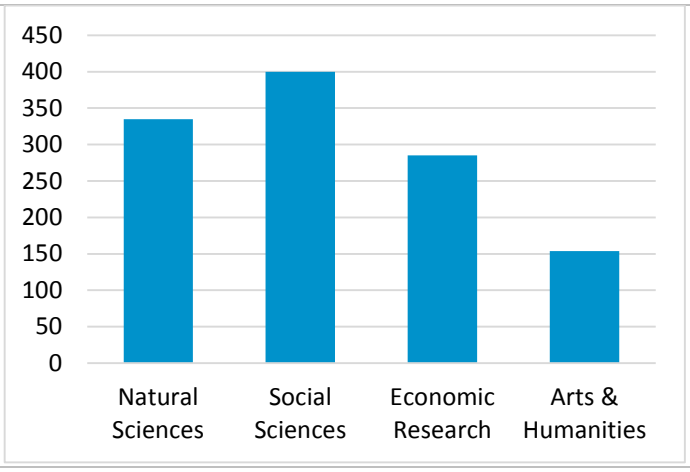
The 223 respondents identified 595 research areas / challenges and 161 engagement opportunities; 139 of these were happy for their details to be shared.

Who responded?

Most people identified themselves as research providers. Research users were primarily practitioners, then policy users and less than 10% identified as business users. Note, Respondents could select more than one category.



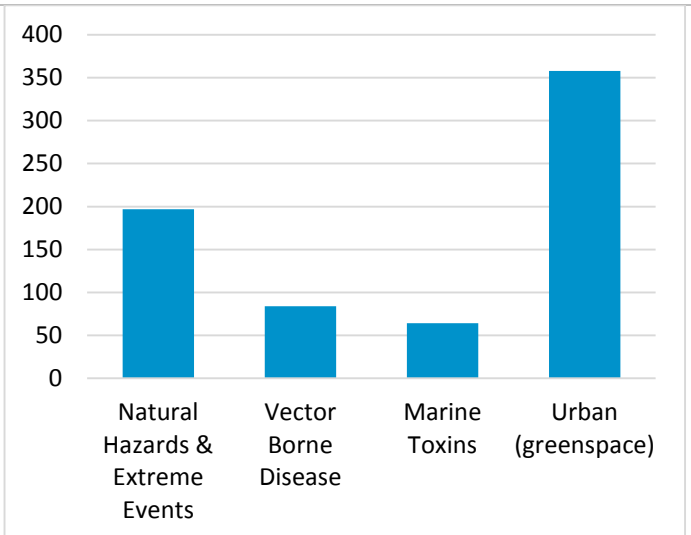
Which disciplines were represented in ideas?



The research ideas / challenges proposed came from across the discipline areas, the highest number were linked to social sciences, the lowest to arts & humanities. Note, ideas / challenges could be associated with more than one discipline

Which topics were represented in ideas?

Urban ecosystems (greenspace) was the most popular topic.



Summary of Survey Results

Research Topic: Natural Hazards & Extreme Events

Survey Question: What are the key research areas / challenges for improving understanding of the role biodiversity & ecosystem processes play in human health & wellbeing, in the area of natural hazards & extreme events?

Responses as a Word Cloud

Categories used to summarise responses

The ideas submitted were grouped into similar topics and are listed below by the four categories identified at the workshop:

- Improving our understanding of health & wellbeing impacts from natural hazards & extreme events across time, space, & scale
- Understanding & valuing the impact natural hazards & extreme events on health & wellbeing impacts with monetary and non-monetary values (e.g. cost to NHS)
- What are the perceived risks of natural hazards and extreme events? How do these affect people's relationships with the natural environment?
- How do we integrate the management of the natural environment to mitigate against natural hazards and extreme events with management for other objectives? (i.e. multiple benefits including health & wellbeing, biodiversity)

Summary of responses

Category	Themes within web survey
Understanding impacts across time, space & scale	• Scale: Local / national, short & long term • Role of green and blue space, including positive regulation • Types of natural hazard: floods, heatwaves, drought, volcanic eruptions • Role of climate change • Understanding function / role / management of named habitats / services e.g. woodlands, wetland, atmosphere, flood buffering at catchment scale, groundwater, offsetting CO2 emissions • Ecosystem resilience & redundancy – benefits of resilience • Humans as part of natural systems • Susceptibility of different social / cultural groups / populations e.g. rural, maritime • Methods: modelling, mapping, replication, scenario socio-economic modelling
Understanding impacts with monetary & non-monetary values	• How to value health benefits of natural processes that mitigate extreme events e.g. flooding • Economic cost of mental health impacts e.g. flooding – economic • Impact on community resilience e.g. flooding • Valuation of (semi) natural processes e.g. farm tillage for increased water retention • Incentives for management • Focus on water – value of water / drought /flood costs
Perceived risk & peoples' relationship with environment	• Barriers to preparing for extremes e.g. heatwaves in UK seen as positive, need to prepare for more floods • Public perception of risk associated with rare vs commoner events • Focus on flood, heatwave, volcanoes, coast
Managing for multiple outcomes	• Examples of potentially conflicting management needs, e.g. ▪ for flooding may impact cultural heritage with monetary and non-monetary value ▪ for upland management / flood risk ▪ any management vs biodiversity • What does effective mitigation for health & wellbeing look like? • 'Concrete' infrastructure vs natural management e.g. perception of concrete infrastructure as more reassuring • Future cities - need for urban development to deliver multiple outcomes e.g. water sensitive cities to drought and flood, location of rural catchment delivering services to urban area • Need for policy but lack of recognition of urgency / priority • Socio / economic angle e.g. role of planning for disadvantaged communities

Research Topic: Marine Toxins

Survey Question: What are the key research areas / challenges for improving understanding of the role biodiversity & ecosystem processes play in human health & wellbeing, in the area of marine toxins?

Responses as a Word Cloud

Categories used to summarise responses

The ideas submitted were grouped into similar topics and are listed below by the categories identified at the workshop:

- Review / scoping (e.g. What do we know & where are the gaps? What is the significance? (health burden, economic costs / benefits); What existing monitoring could help and what is needed? What can we learn from international / historical experience?)
- Future forecasts (e.g. Risks in context of environmental change, underlying mechanisms, needs for evidence base for modelling, what are the implications of human behaviour?)
- Land and Water management (e.g. catchment management to reduce the risk of disease / toxins, understanding risk / mitigation, assessing pre-emptive vs reactive approaches)

Summary of responses

Category	**Themes within web survey responses**

Review / scoping	• Understanding mechanisms
	• Evaluating impacts
	• Examples of systems:
	  ○ marine environment
	  ○ marine aerosols
	  ○ toxic algae
	  ○ environmental quality
	  ○ cities

Future forecasts	• Future climate predictions
	• Impact of human activity
	  ○ e.g. atmospheric deposition impact on phytoplankton
	• Understanding mechanisms for future scenarios e.g.
	  ○ algal blooms
	  ○ marine litter
	  ○ physiological pathway for toxin production
	  ○ need for monitoring e.g. blue green algae

Land and water management	• Examples of systems / issues for marine environment:
	  ○ Increasing shipping atmospheric emissions
	  ○ Dredge spoil disposal
	  ○ Toxic chemicals released in exploitation of coast
	  ○ Role of local / regional marine stewardship

Research Topic: Vector Borne Disease

Survey Question: What are the key research areas / challenges for improving understanding of the role biodiversity & ecosystem processes play in human health & wellbeing, in the area of vector borne disease?

Responses as a Word Cloud

Categories used to summarise responses

The ideas submitted were grouped into similar topics and are listed below by the categories identified at the workshop:

- Review / scoping (e.g. What do we know & where are the gaps? What is the significance? (health burden, economic costs / benefits); What existing monitoring could help and what is needed? What can we learn from international / historical experience?)
- Future forecasts (e.g. Risks in context of environmental change, underlying mechanisms, needs for evidence base for modelling, what are the implications of human behaviour?)
- Land and Water management (e.g. catchment management to reduce the risk of disease / toxins, understanding risk / mitigation, assessing pre-emptive vs reactive approaches)

Summary of responses

Category	**Themes within web survey responses**
Review / scoping	• Understanding mechanisms & evaluating impacts ○ Exposure & assessment of risk ○ Monetary & non-monetary valuation ○ Economic, political & social aspects ○ Use of earth observation data ○ Prevalence of exposure to disease occurrence

	• Examples of systems / issues :
	  ○ Animal-human disease interactions (disease biobanks, public health, economic inequality
	  ○ Use of pesticides in managing infections
	  ○ Value of genetic resources
	  ○ Effect on reproductive health
	  ○ Burden from human recreation

Future forecasts	• Forecast for future climate predictions / climate extremes
	  ○ Disease activity & Exposure
	  ○ Impact of human activity e.g. International trade
	• Understanding mechanisms for future scenarios e.g.
	  ○ Viral pathogens
	  ○ Digestate & sewage sludge
	  ○ Parasite biodiversity
	  ○ Microbial biodiversity
	  ○ Wildlife /domestic animal / human interaction
	  ○ Molecular interaction of organisms
	  ○ Beyond malaria
	  ○ Antibiotic resistance
	• Need for baseline & long term modelling
	• High risk groups – detection & meeting needs
	• Public awareness of risk, behaviour

Land and water management	• Examples of systems / issues for vector borne diseases:
	  ○ Pasture management / parasite load
	  ○ Urban greenspace & vectors e.g. lyme disease
	  ○ Role of microbiota on health of wild populations
	  ○ Aquaculture economics & welfare
	  ○ Marine management
	  ○ Wetlands & mosquito habitat

Research Topic: Urban Ecosystems (Greenspace)

Survey Question: What are the key research areas / challenges for improving understanding of the role biodiversity & ecosystem processes play in human health & wellbeing, in the area of urban ecosystems (greenspace)?

Responses as a Word Cloud

Categories used to summarise responses

The ideas submitted were grouped into similar topics and are listed below by the categories identified at the workshop:

- Scoping and describing what is already in place / being used *(combined with Evaluation and Understand categories for this exercise)*
- Evaluating what works / what doesn't work (e.g. existing initiatives, international policies / design / management, green/blue health and wellbeing experience of different groups)
- Understanding why it works / doesn't (e.g. how to get impact on health & wellbeing, understanding mechanisms, characterising effect)
- Design & management (including social, cultural, historical)
- Mainstreaming (from research to decision makers, toolkits, governance issues)

Summary of responses

Category	**Themes within web survey responses**
Scoping, Evaluating, Understanding	• Need to examine current evidence / evaluate / understand role in human health and wellbeing of greenspace – examples of impacts / study systems: ○ Health aspect (e.g. Mental health, Lung disease, Immune regulation, inflammatory processes)

	○ Environment (e.g. Air pollution, Soils, Woodland, Abiotic (geodiversity),Wild places, Water management) ○ Activity/Use (e.g. Physical activity (cycling), Food production, Zoos) • Scope of topic ○ Beyond urban – peri-urban / rural ○ Include Blue space including coastal (incl coastal cultural value, urbanised coastlines) • Other major issues ○ Role of climate change ○ Quality of biodiversity – does it matter? ○ What works in delivering multiple benefits ○ Monetary valuation especially related to NHS savings ○ Access vs Actual Use of greenspaces • Socio-economic inequalities & value for different groups e.g. childhood (e.g. obesity, outdoor learning, early experience and valuation later in life), aging population, ethnicity, gender, • Cultural value (green/blue/grey, soft outcomes of engagement, beliefs, behaviours, connection with creativity) • Methodologies & measurements – interdisciplinary for valuation ○ Intervention studies & comparison with other interventions ○ Scale and time (Longitudinal studies, long term, national & local, how much space, where located) ○ Beyond monetary values ○ New technologies (e.g. neuroimaging, phone apps) ○ Measures to suit users / policy makers e.g. health-dose response, link to biodiversity indicators
Design & Management	• Designing & managing urban ecosystems H&W benefits for: ○ Different user groups (e.g. aging population, childhood engagement, cultural differences, health inequalities) ○ Real biodiversity as well as other benefits ○ Heatwaves ○ Urban design (e.g. green walls, green roofs ○ Real use for physical activity, urban agriculture etc
Mainstreaming	• Providing evidence ○ Provide businesses and policymakers with economic evidence (PHE, local health boards, health & social care commissioners etc) ○ Evidence in the way decision makers need it (e.g. robust as RCT) ○ Raise awareness of benefits (e.g. health commissioners, land managers, local authorities, housing associations, constructors) • Integrated decision making ○ Unite public health & spatial planning (e.g. ecosystem approach into statutory plan frameworks, unified models for planners) ○ Integrating greenspace use into education / health / work spheres • Develop practical methods to broaden “dose of nature” prescription (e.g. Intermediaries to link GPs to land managers • Produce case studies of effective use of broader valuation in decision making, showing partnership delivery & role of local communities

Research Topic: Cross Cutting Issues

Survey Question: What are the key cross cutting research areas / challenges for improving understanding of the role biodiversity & ecosystem processes play in human health, in the area of natural hazards & extreme events, vector borne disease & marine toxins, and urban ecosystems (greenspace)?

Responses as a Word Cloud

Categories used to summarise responses

The ideas submitted were grouped into similar topics and are listed below by the categories identified at the workshop:

- Historical perspective (e.g. how the past informs present & future, historical contingencies) *(no responses)*
- Temporal dimension (e.g. intra/inter-generational, interventions in the context of wider health, future planning, cumulative impacts of repeated exposure) *(no responses)*
- Pluralistic methodologies, data, infrastructure & evidence (e.g. developing interdisciplinary capability, beyond monetary methods, potential for public evidence)
- Social and cultural dimension (e.g. inequality/environmental social justice, value of nature and health culturally defined, class/race/gender)
- Links to decision making (e.g. different models / scales of governance)

Summary of responses

Category	Themes within web survey responses
Pluralistic approach	• Biodiversity (economic, aesthetic, trade off with other land use, invasive species, understanding specifics of role e.g. species rich vs amenity grassland under drought conditions, restoration of natural habitats • Scale: Local / landscape / national - Importance of place / landscape scale evaluation, Public Health – national framework • Climate Change • Water and coastal management & cultural values • Methodologies – **development of common measures for valuation, quantification of benefits** universal currency, indicators, , visual mapping shared across disciplines, explicit link natural elements and values e.g. do waterbirds increase the aesthetic value of a catchment • Making best use of the existing evidence base • Future scenarios e.g. ecosystem services and food prices • Role of humans: Humans as part of nature, Human behaviour & decision making - impact on the environment, Human experience of nature related to exposure, culture • Deeper interdisciplinary working (bring together philosophies & knowledge systems of natural, physical, social sciences, economics, arts), bringing in relevant disciplines (e.g. neuroscience, ecosystem-based adaptation, human geography, environmental psychology, archaeology) • Transdisciplinary approach, cross sector working (research, policy, practice, citizens) • Integrating monetary & non-monetary values – market based systems, shared and social values, payment systems, ethics, evaluation of translation into financial value, Trade off in values, Linking economic values to ecosystem service science • Interdisciplinary research to encompass valuation approaches to specific topics: e.g. atmospheric services, ecological burial sites, turf stripping, peatland/carbon conservation • Techniques: Genetics, epigenetics, microbiota & host, systematic mapping, remote sensing,
Social & cultural dimension	• Mapping cultural landscape • Social alienation • Understanding motivations • Socio-economic link -Impact on different groups, poverty alleviation • Societal understanding of ecosystem services • Language construction of relationships e.g. of economics, landscape, natural processes • Divergent cultural values & spiritual values • Use of natural space - understanding motivation
Links to decision making	• Stakeholder engagement to identify research priorities & barriers to uptake, and relate to policy and practice needs – co-design, translation of complex messages • Decision making frameworks for national accounting / local picture • Public understanding of risk and ecosystem services • Access to data e.g. for rural businesses

	• Public participation & role of local communities - involvement in ecosystem service assessment and provision, pressure groups in urban democracy, role in citizen science • Making (economic) valuation easier to use, more affordable, more applicable, developing and piloting new approaches • Providing evidence for range of users e.g. private sector, healthcare, NHS, NGOs, across government departments, national parks

Annex A – Survey questions

1. Please tell us about yourself

- Name
- Organisation
- Location
- Contact email

1.1 Are you happy for us to share your contact email with others interested in the Valuing Nature programme?

1.2 What is your role?

- Research provider
- Research User (policy)
- Research User (business)
- Research User (practitioner)
- Other (please specify)

2. What are the key challenges you would like the call to address?
Please provide up to three key challenges. These could be research gaps, societal challenges, they could relate to one or more of the themes, or to the broader challenges of interdisciplinary working and monetary and non-monetary valuation.

2.1 Please tell us which of the areas below each of your challenges relates to.

- Interdisciplinary Research
- Valuation
- Health & Wellbeing
- Natural Sciences
- Social Sciences
- Economic Research
- Arts & Humanities
- Natural Hazards & Extreme Events
- Vector Borne Disease
- Marine Toxins
- Urban (greenspace)

3. Can you offer an opportunity to engage with Valuing Nature Programme projects?
For example, are you interested in working in partnership with researchers, do you have a site/activity/idea that could become a case study for a research project, do you have datasets that could be useful to research, could you provide a private sector secondment opportunity, or is there any other way you could work with a VNP project?
Please provide details of what you could offer:

3.1 Which area(s) is it relevant to? (optional)

- Interdisciplinary Research
- Valuation
- Health & Wellbeing
- Natural Sciences
- Social Sciences
- Economic Research
- Arts & Humanities
- Natural Hazards & Extreme Events

- Vector Borne Disease
- Marine Toxins
- Urban (greenspace)

3.2. Are you happy for this opportunity to be included in an on-line resource for people who are considering bidding into the funding call? (optional) Yes / No

4. Please provide one short sentence on why this work is important.
We would like to use these in VNP communications.

Annex B – Thinkpiece

Managing the Environment to Improve Human Health & Wellbeing

Identifying Research Challenges for the Valuing Nature Programme

Introduction

The Valuing Nature Programme (VNP) is a new five year, c£6.5M research programme supported by NERC, ESRC, BBSRC, AHRC and Defra. It aims to better understand and represent the complexities of the natural environment in valuation analyses and decision making, and to consider the wider economic, societal and cultural value of ecosystem services, even where these have no perceived market value.

The next funding call will address the Valuing Nature Programme's goal of "*Improving our understanding of the role biodiversity and ecosystem processes play in human health and wellbeing"* and is supported by NERC, ESRC and AHRC. Within this area, the research will be specifically focusing on the themes of:

- natural hazards and extreme events
- the exposure of people to vector-borne diseases and marine toxins
- health improvements associated with urban ecosystems (green space).

The VNP Coordination Team are asking for input to identify key research challenges that could help develop interdisciplinary capability across the funders' remits. The text below is intended to provide background on the funders' perspectives and stimulate ideas to help identify key challenges. Responses will be used by funders of the Valuing Nature Programme *Health & Wellbeing call* to contribute to the shaping of the call, which will be announced in May 2015.

The context

The socio-economic drivers of human health and wellbeing are relatively well characterised, but there is much less understanding about the role of the environment in determining mental and physical health and wellbeing outcomes, or how environment might interact in different contexts with known socio-economic drivers and cultural factors. Biodiversity and ecosystem functions certainly influence human health and wellbeing through the broad range of benefits that we derive from the natural environment, including protection from natural hazards such as floods, toxins and disease; and the aesthetic, cultural and recreational benefits derived from ecosystems, habitats and landscapes. Despite our awareness of this influence, we know little about the precise links between the dynamics of ecosystems and the outcomes for physical and mental health and wellbeing, the responses of different groups in society over different time periods, or the role of biodiversity in modulating outcomes. Therefore it is currently not possible in many cases to evaluate the outcomes of different environmental policy or management interventions in terms of human health and wellbeing.

One of the key challenges recognised by the Valuing Nature Programme is to improve and advance valuation evidence in economic (including monetary) terms and in other terms, but also to clarify the limits to valuation (including where uncertainties and sensitivities may arise in the use of these approaches). A particular challenge for decision making is how to integrate monetary and other

valuations, and this may be best advanced with some practical case studies. The specific focal topics outlined below give the opportunity for cross-disciplinary research which gives consideration to the environmental, social, cultural and health dimensions.

A strong focus within the programme will be on how research outcomes can be used to inform decision making, particularly for the health sector, at a range of levels (from national policy to local delivery). Hence the emphasis is not simply on improving understanding and the delivery of evidence, but also on potential barriers to translating that evidence into appropriate action. For example, new forms of governance may be necessary for individuals, communities, organisations and governments to take decisions which adequately reflect valuations. Addressing these issues could have significant impact: Department of Health figures estimate that poor mental health, for example, costs the UK economy £145 billion per annum in healthcare, benefits and lost productivity. Even if improved ecosystem management reduced only a fraction of these costs, the economic benefits of the research could be substantial. This will necessitate a broad interdisciplinary and cross-sectoral approach.

- What are the overarching research challenges the programme should address? Examples could relate to: the integration of natural science, social science and the arts and humanities into valuations; the integration of monetary and non-monetary valuations; improving translation of evidence into public and private sector action; improving understanding of the role of biodiversity in modulating mental and physical health and wellbeing outcomes. Do you agree with these and are there any missing?

The focus

The specific focus of the VNP Health & Wellbeing Call will be on the following areas.

1. Natural Hazards and Extreme Events

Natural hazards and extreme events have negative effects on physical and mental health and wellbeing[1]. In the language of ecosystem services, negative health effects frequently arise because ecosystems fail to regulate natural hazards. The extreme events of greatest relevance to the UK are floods and droughts, so these should be the principal focus, although drawing on overseas comparisons may prove useful. The motivation is to understand what environmental characteristics might prevent or ameliorate floods or droughts; how different management interventions (e.g. at the catchment level) might improve natural hazard regulation in ways that reduce negative health impacts; how such management interventions might impact on the delivery of other benefits, such as cultural or recreational benefits; and how outcomes might be valued in both monetary and non-monetary terms, and particularly in terms of health outcomes.

There is significant potential in adopting historical approaches to understand the health and wellbeing impacts of past events. Narratives may reveal how they were recovered from, if they influenced the impact of later events, or could do so in the future. Memories of past events could be used to explore the role of community participation and other social responses in relieving the impact of living with

[1] Alderman, K. et al. (2012) Floods and human health: a systematic review. Environmental International 47, 37; Stanke, C. et al. (2012) The effects of flooding on mental health: outcomes and recommendations from a review of the literature. PLoS Currents Disasters 4.

the risk of natural hazards and the negative effects of extreme events on mental health and wellbeing.

- Is the emphasis on floods and droughts appropriate? Should heatwaves be included?
- What are the main interdisciplinary research challenges in this area (that link environment, interventions and mental and physical health and wellbeing outcomes)?
- Are there specific international examples that are particularly relevant?

2. Exposure to vector-borne diseases and marine toxins

Biodiversity can affect health through exposure to diseases or toxins[2]. Negative health effects can arise because ecosystems fail to regulate diseases to some extent. There is evidence that biodiversity plays a role in disease regulation[3]. However, less is known about the management interventions that could improve or worsen health and wellbeing outcomes. Patterns of exposure may not only be due to a changing environment but also to changing behaviours. How do behaviours affect risk, and what are the most effective methods of community engagement to inform behaviours to reduce risk?

- What are the main interdisciplinary research challenges in this area?
- How does this link to the other two areas?

3. Urban Ecosystems

Biodiversity and ecosystems in the form of green space and blue space can improve health (both physical and mental) and wellbeing through changes in the aesthetic, cultural and recreational attributes of natural systems[4]. How does the composition and design of natural space influence the health outcomes? There has been considerable research activity in this area, but gaps remain. For example, relatively little is known about the role of biodiversity in natural spaces in influencing health outcomes. How are experiential aspects of natural space influenced by biodiversity or culture? The existence of good quality space may be insufficient to deliver the intended benefits if not used, or if not used actively by some groups in society. What are the barriers to behaviour change?

It will be important for research to evaluate the multiple benefits of interventions in ways that will link together various sectors, such as Local Enterprise Partnerships, Local Nature Partnerships and Health & Wellbeing Boards. An important aim is to provide outcomes that enable different sectors to work together in whole system approaches to local issues.

- What are the main interdisciplinary and cross-sector research challenges in this area?
- The original call text confined this area to greenspace. Should blue space also be included? What are the advantages and disadvantages of doing so?
- What are the most important links between this and the other two areas?

[2] Keesing, F. et al. (2010) Impacts of biodiversity on the emergence and transmission of infectious diseases. Nature 468, 647; Chambouvet, A. et al. (2008) Control of toxic marine dinoflagellate blooms by serial parasitic killers. Science 322, 1254.

[3] Zaghi, D. et al. (2010) Literature study on the impact of biodiversity changes on human health. Comunita Ambiente Srl, report for the European Commission (Directorate General Environment), July 2010.

[4] Lee, A.C.K. & Maheswaran, R. (2011) The health benefits of urban green spaces: a review of the evidence. Journal of Public Health 33, 212.

Annex C – Full responses

Natural Hazards & Extreme Events

Understanding impacts across time, space & scale

290	High resolution regional estimates of climate change impacts, with an emphasis on extremes and any biodiversity of ecosystem responses to these
456	More information on the health impacts, and so mitigation measures, of climate change, or extreme events, would be very helpful.
416	Quantification of the benefits to well-being from regulatory ecosystem services provided by water bodies
493	How to value the redundancy in systems which promotes resilience ecosystem functions?
523	How to calculate the benefits of natural hazard resilience measures beyond the natural hazard resilience itself?
530	role of ecosystems in protecting society against extreme climate events (e.g. flooding)
339	Quantifying the long-term health and well-being effects of extreme events on different social groups e.g. floods, heatwaves.
490	Develop scenario based approaches to the utilisation of system dynamic socio-ecological modelling
506	Impact on health of volcanic eruptions (e.g. gases, SO2, HCl) - acute local impact versus wider impact
1	The relationship between blue and green infrastructures, natural hazards and extreme events, and physical and mental health
7	What is the role natural ecosystems have in buffering flood impacts at the catchment scale
12	Better data on science quantifying certain ecosystem services e.g. contribution of woodlands and wetlands to reductions in flood risk
38	Identification of links between extreme weather and mental health
89	Wellbeing and health issues associated with flooding risks
100	Rethinking the Nature/Culture and human(consumer)/nonhuman(consumed) divide
161	Natural Hazards & extreme events
192	Who is most susceptible to mental health impacts of flooding and can susceptibility be predicted?
195	Understanding the health impacts, particularly mental health impacts, of flooding
222	Extreme event (and chronic, erosive conditions) roles in conflict, migration and security
228	Understand the impact of extreme climatic events on ecosystem services
259	The health and well-being of remote and rural communities in the context of extreme weather episodes
265	intracultural and/or intercultural migration due a change in ecosystems
268	Do natural ecosystems positively influence population vulnerability to extreme events
296	Other characteristics which promote resilience of ecosystem functions in the face of extreme events
324	impact of extreme climate change-driven events on exposure of historic landfill and contaminants
337	What are the mental health impacts of natural hazards.
360	What are the essential elements of the dynamic human-environment relationship that influence mental health and wellbeing after natural disasters and extreme events and how can we best transform and manage this process
366	What are the Water-Energy-Food interactions that can be impacted by increasing drought conditions in the UK?
367	Spatio-temporal mapping and modelling of ecosystems and the impacts of natural hazards
395	Finding ways to be able to replicate it easier

427	Atmospheric Services and climate change
429	greater understanding of how individual habitats affect groundwater recharge
485	Ecosystems resilience, adaptation to climate change and biodiversity conservation
486	Effects of extreme weather events on mental health and well-being
488	Determine with better precision the extent to which ecosystems will continue to offset (through sequestration) at least some CO2 emissions
558	Health impacts of floods over time
585	The impact of storm events on maritime communities

Understanding impacts with monetary & non-monetary values

499	Scenario building: function and value of natural flood protection given different risk scenarios and system stability
4	Understanding the mental health impacts of natural hazards and extreme events, and identifying practical, self-sustaining methods for reducing the likelihood and severity of these effects. There is an increased focus in increasing both environmental and community resilience to flooding, but limited understanding as to how these forms of resilience are valued, especially in terms of their mental health benefits. There is a need to more fully understand the mental health costs of flooding (both monetary and non-monetary), and monitoring the reduction in these costs as a result of different interventions.
9	Valuing flood water storage through (semi) natural processes e.g. farm tillage practices that increase water retention, surface water storage etc.
15	How to value the health benefits of resilience to natural hazards?
16	Quantifying Externalities (diffuse pollution; flood mitigation; biodiversity & habitats provision; landscape provision)
65	Quantifying / enabling quantification of ecosystem benefits of RD/management schemes i.e. appropriate 'income foregone and additional costs', which does not currently lead to sufficient incentive in some cases (e.g. flood management).
305	Value of flood and erosion preventioning by natural ecosystems of different bio-physical states
382	Valuation of water in society
474	Valuing resilience to drought - how much are natural intervention measures to improve drought resilience worth in the long-term?
548	economic value of natural habitats in disaster prevention
570	What is the economic cost to individuals and the state of mental and well-being impacts of flooding?

Perceived risk & peoples' relationship with environment

459	What is the effect of natural hazards and extreme events to the coast? Both the direct and indirect effects (which can include associated marine toxins) of sea level rise, big tides, coastal flooding and extreme weather events need to be examined as these events have the potential to effect the large populations of people living, working and visiting these environments. Specifically, how do individuals' perceived risk, behaviours, and experience of these environments change in response to these hazards and events?
17	People's responses to perceived and actual risks of flooding
70	Psychological barriers to preparing against heatwaves in the UK (eg positive feelings about hot weather)
103	Educating the public what 'risk' really is and how it relates to everyday day-to-day life
140	How to deal with uncertainty
288	Public perceptions of climate change, extreme weather, and adaptation

316	How we perceive and respond to rare (but massive) events compared to commoner (but less extreme) events - e.g. big Icelandic volcanoes versus flooding of houses y the side of the River Severn every other year
409	Preparing the resilience of the UK population against future flooding, including prevention and mitigating actions they can take.

Managing for multiple outcomes

402	How to maximise the benefits for biodiversity, health and well-being from green infrastructure - planning and implementation
401	What does effective mitigation against the health impacts of flooding look like and what role is there for individuals, communities and the state in reducing health impacts?
428	Gap between public understanding /will for action...and government intransigence on meaningful policy
521	Spatial planning and the impact of climate impacts on poverty and disadvantaged communities
5	How management interventions to ameliorate flooding may impact upon the cultural benefits of heritage in monetary and non-monetary terms
10	Protection from natural hazards or reactions to extreme events usually result in calls for engineering/infrastructure/'concrete pouring' solutions as they tend to be big and noticeable. How can we communicate that changes elsewhere in, for instance, a catchment can have significant results downstream without such solutions? Can this ever be reassuring? Can the multifunctional benefits be highlighted?
13	Creating water sensitive cities - liveable places that are resilient to drought and flooding
80	Ability of biodiversity (i.e. genetic, species and landscape biodiversity) to mediate the impact of extreme events on ecosystem functions
155	What UK policies can deliver natural flood alleviation in an economic, efficient, robust and climate-resilient way?
157	Impact of upland habitat management on flooding risk
171	Viability of Natural Flood Management for flood mitigation
327	increasing collective sense of agency and responsibility to act to prevent/mitigate natural hazards and extreme events
334	Role of natural flood defences in mitigating extreme events
343	Consideration of how the location and functioning of urban and rural ecosystems (wetlands including natural and constructed systems, forestry including street trees, interventions in catchments, etc.) affect health-relevant, ecosystem service-mediated outcomes that may include flood and drought risk, urban air quality, water pollution, and access to green spaces and nature with physical and mental health implications.
350	Impact of different land management interventions (e.g. organic, agroecological, agroforestry) on flood and draught risk management at different landscape levels from field to catchment
520	Multiple uses and biodiversity enhancement on flood defence and coastal infrastructure
581	Designing scenarios for the future sustainable city considering climate change and ecosystem dynamics

Marine Toxins

Review / scoping

399	Impact and value of marine environment for health
421	Potential impact of marine aerosols on human health
478	Does sea spray act as a vector for the spread of airborne marine toxins and microbes into coastal cities?
515	Evaluation of impacts (societal, economical and on ecosystems) of toxic algae
552	Exposure to vector - borne diseases and marine toxins
556	Marine toxins and vectors link to Human health and environmental quality

Future forecasts

116	Harmful Algal Blooms: mechanism of formation and interaction with changing environment
254	Whilst coastal and marine environments can be associated with positive health and well-being impacts, what is the impact of related diseases, harmful algal blooms, and marine toxins? For example, a growing issue (and a consequence of visiting these environments) is marine litter, which has started to be examined in terms of its impacts on people's health and well-being. More needs to be done to look at people's perceived risks and how this influences their behaviour, and how to reduce these risks.
308	The effect of increasing urban airborne atmospheric emissions on the health of the marine environment
329	understanding physiological pathways for toxins production
500	Phytoplankton responses to modern and future anthropogenic atmospheric deposition
583	High spatial and temporal resolution of pathogen (e.g. blue green algae) monitoring

Land and Water Management

93	The effect of increasing shipping atmospheric emissions on the health of the marine environment
111	Impact of dredge spoil disposal on the marine environment
434	Identify the risks of exposure to toxic chemicals released during exploitation of the coastal environment
592	Role of local and regional marine stewardship in detoxifying the seas

Vector Borne Disease

Review / scoping

131	Economic, political and social aspects of animal-human disease interactions (disease biobanks, public health, economic inequality, etc.)
138	Environmental impacts on health - from pesticide to infection
139	Exposure of people to vector-borne diseases and marine toxins - assessment of risk and monetary and non-monetary valuation of human disease burden from UK origin shellfish consumption
143	The monetary and non-monetary values of genetic resources [bio-]diversity - e.g. cultivated plants (including trees), farmed animals (including fish), crop wild relatives, etc.
156	Methodological research how Earth observation and other spatial data can be used for vector borne disease studies
330	effects of vector-borne disease/environmental hazards on reproductive health
351	Exposure of people to vector-borne diseases and marine toxins - assessment of risk, monetary and non-monetary valuation of human disease burden from open water recreation (swimming, surfing)
551	How prevalent is exposure of vector-borne diseases compared to actual disease (manifestation of clinical symptoms), and what determines whether disease is developed or not after exposure?

Future forecasts

11	Assessing the role of viral pathogens in the environment to human health.
35	Exposure to diseases or toxins
59	Understanding the effect of climate extremes on vector-borne disease transmission
133	Impact of digestate and sewage sludge on consumer acceptance and ecosystem health
142	Long term monitoring of parasite biodiversity to provide essential baseline data for predicting disease spread under variable climatic conditions
160	Can we develop short-term forecasts of risk of exposure to vector-borne diseases, e.g. due to weather conditions?
164	Wildlife/ domestic animal/ human health interactions (One Health) inc new diseases
229	International trade and climate change leading to increased risks of vector borne diseases
234	Determining baseline data for microbial (bacteria/viruses/algae/protist) biodiversity to help assess impact of extreme weather events.
322	Is the risk of exposure to vectors and disease increasing in high risk groups (i.e. hunters), is this being detected and are their health needs being met
358	Interactions of organisms in ecosystems at the molecular level
371	Can we identify landscape/land use/habitat predictors of high risk of vector-borne diseases in order to better target warnings/mitigation measures?
440	Understanding the potential changes in disease vectors with a changing climate, and how does this effect public awareness, concern, and behaviour.
480	How significant are vector-borne diseases in the UK? If expanding outside UK, is there scope to look at neglected tropical diseases (anything that isn't malaria which already attracts significant research funding)?
482	Use of antibiotics and resistance dangers

Land & water management

73	pasture Management, effect of grazing and parasite load
278	Managing urban green spaces to minimise the risk of Lyme disease and its vectors

346	Understanding the role microbiota have on the fitness, reproduction and survival of wild species. In particular there are the beginnings of understanding of the impact of loss of particular bacteria on the survival of bees, the presence of particular bacteria (male-killers and other manipulators of reproduction) on the reproduction and hence population sex ratios of many species of insects (best known ladybirds and butterflies). There are many examples of specific (e.g. bacteria) which provide a benefit or cause a disease. However much less is known about for example gut microbiota in non-human hosts. NGS techniques enable rapid identification of anything up to individual specific microbiota, but very little work has been published on how presence/absence of bacteria, fungi and viruses interact on a large scale with host ecology.
406	Improve economics of aquaculture and welfare of farmed fish by reducing the impact of infectious diseases. Fish represent the most important source of protein for human consumption, and yet farming is severely threatened by parasites, some of which also pose a zoonotic threat to humans.
417	Identifying and mitigating habitats for disease vectors in urban landscapes
437	Understanding the best use of valuation for practical application in delivery of marine management
477	Mitigating the effect of wetland redevelopment on mosquito habitat creation

Urban Ecosystems (Greenspace)

Scoping, Evaluating & Understanding

75	Development and evaluation of interventions to reduce air pollution
104	The importance of green space in influencing urban air quality and human exposure to air pollutants
302	The relationship of air pollution to incidence of chronic lung disease, an increasing global problem
33	How does blue-space compare to green-space in terms of impacts on health and well-being effects? Whilst the majority of the literature has been dedicated to predominantly green-space, work has started to show that blue-space may have greater benefits. As an island nation, this is especially relevant for the UK to uncover the implications this asset can have for industry, the health sector, economy and the general public.
48	Exploring the role of urban blue space, as a complement to urban green space, in promoting human health and well-being
92	The link between environment (blue space) & wellness / health.
244	Yes - the call should include blue and greenspaces. The conservation challenges facing aquatic ecosystems are considerable; results suggest that bluespace could have a considerable societal wellbeing benefit, whilst also providing different types of nature experiences. Therefore, the questions in this call are equally relevant to bluespaces.
388	Expansion of greenspace to include bluespace (inc. coastal use)
517	Evaluation of the health benefits of blue space.
128	urban nature and psychological / physical health of children including obesity prevention and treatment
463	Impact measures around long term benefits of outdoor learning
532	Putting an economic value on the life-long benefits to health and wellbeing which might accrue from childhood experience of nature.
72	Continue research to identify climate sensitivity (what is the equilibrium warming for a doubling of atmospheric CO2) - and build our cities appropriately to be able to adapt. This could include clever use of "green spaces"
18	Assess the social, health, conservation, ecological and economic value of coastal habitats
307	The cultural value placed on the coast by visitors - identity, family narratives and heritage.
582	Quantification of the benefits to well-being provided by the coastal environment.
442	Need for longitudinal studies

129	Establishing the long term health gains of effectively engaging individuals with the natural environment ie tracking outcomes post intervention
135	Demonstrating a causal link between change in urban green space environments and change in *population* health and wellbeing (the technical challenge of tracking urban green space over time in large numbers of towns and cities)
483	Cost-benefit analyses are required to demonstrate the potential savings of using nature based interventions for certain health issues
62	Quantifying the benefits of urban green space for health, climate and society
130	Assessing the need for ecosystem services (e.g. temperature regulation, flood control) in urban areas, and using that objective assessment to plan the provision of multifunctional green space in urban areas.
320	Identifying the range of benefits from green infrastructure and communicating how these can be paid for
167	Valuing links between green space and subjective wellbeing at the national and local level
378	Valuing links between ecosystem services and subjective wellbeing at the national and local level
345	NHS savings that could be delivered through use of greenspace & woodlands
14	Specific impact of biodiversity on health & wellbeing (ie not just outdoors / low-nature greenspace)
321	Assessing quality of green spaces relevant to health
387	in particular mental health impacts of exposure to semi-natural green space
400	Health benefits arising from, or assigned to, specific habitats ie. woodland as opposed to greenspace
282	smart cities and human and environment health
30	It is not enough to simply provide high quality environments in deprived communities (although clearly a strong step in the right direction). We need to understand how to improve activity and utilisation of the environment when it is provided, especially in vulnerable communities.
347	Demonstrating a causal link between access to urban green space and reduced socio-economic inequalities in health and wellbeing
357	Valuing healthy soils in urban environments
535	The role of urban food production for the provision of green space and in improving health (both physical and mental)
2	Quantification of health costs and benefits attributable to ecosystem services, not only in urban areas but also in peri-urban and rural areas.
69	Wellbeing improvements associated with working in a natural landscape
19	Identifying components of the environment which contribute to human health and wellbeing
28	Isolating a scientific way to measure the benefit of green spaces for human health and wellbeing
36	Useable approaches for quantifying impacts of changes in quantity, quality and location of green space on people's wellbeing. Approaches are needed to help inform investment that are usable for relatively low cost interventions.
39	Improve methodologies and tools to evaluate the impact that environmental organisations are having on urban ecosystems (green space).
47	Put a value on exposure to green space in relation to health and wellbeing
49	Measuring and evaluating health improvements in both wellbeing and monetary terms, as a result of green urban spaces.
51	Determining the effect that green urban settings have on happiness and well-being
94	mental and physical health benefits of woodland and forest
101	The role of abiotic nature (geodiversity) in health and well-being in both urban & rural environments
114	Quantification of the impacts on health and well-being provided by contact with nature, e.g. recreation and amenity

118	Effectiveness evaluation of green space on health using intervention studies. There is evidence of health benefits of green space on health, but there are few evaluations of green space interventions (e.g. putting park, improving parks, getting people to use parks, planting trees in streets etc)
122	Economic benefits of landscapes for recreation that sustains fitness, especially cycling and walking; is there a market failure? How does Scotland's open access help, compared with relatively closed England and Wales
127	The comparative worth of improvements in well-being and health delivered by green infrastructure (includes water) and other forms of interaction with other forms of green space (e.g. National Parks)
145	The evidence base on the associations between urban green space and health outcomes (mortality, disease incidence / prevalence is currently very limited.
178	Increasing Physical activity
202	The role of natural systems and wild places in human well-being
248	Understanding the scale of the health and wellbeing benefits already received by green space
263	Quantification of public health benefits associated with urban green spaces
270	how money can be saved by prescribing 'green time'
284	Comparison studies between nature based activities and other health and social care interventions is required
294	How to quantify, particularly in economic terms the health value of the environment
309	role of zoos as important urban green spaces
342	Assessing the health benefits delivered by urban green space in the UK
368	impact of natural habitats on mental health
372	Urban ecosystems
376	Quantifying the role of urban greenspace to improve physical and mental health
391	Impact on (bi)cycling in the environment on wellbeing
425	Linking health directly with green spaces - usage and availability
426	How do cultural ecosystem services contribute to human wellbeing?
461	Urban ecosystems
468	Exploration/understanding of link between different types of natural feature and different health and wellbeing benefits
496	Food prevention using urban greenspace
509	Linking urban challenges on sustainable water management with whole catchment based approaches
527	Relating the form of urban environments in the UK to objective measures of the quality of life, and deriving policy responses which will improve the quality of life.
546	How much urban green space exists in the UK, of what type (e.g. biodiversity) and is it accessible and utilized?
150	Establishing salutogenic (health improving) effects of biodiverse rich environments on specific sub population groups that tackle particular health challenges of the future i.e. mental health and ageing
273	The role of the community in food value and waste
86	The effect of human activity on the content of the air we breathe
214	role of urban ecosystems in reducing air pollution
220	Air Quality in urban areas and public health
317	The role of urban vegetation as a source and sink of air pollutants: how important is species choice vs greater biodiversity?
424	How connection to nature via the arts (e.g. inclusive arts practice, environmental arts therapies) can contribute to wellbeing
20	Determine the amount of exposure to different qualities of green space, water or coasts in and around urban areas delivers improved health and well-being

60	How clean is the air we breathe in the blue space? To what extent is the coastal population exposed to clean air (e.g. remote Atlantic) and polluted air (e.g. ship stack emissions or European pollution)?
125	Trade-offs between blue infrastructures and blue growth
271	addressing gaps in evidence base in relation to the health benefits of water in the environment (blue health)
314	Emphasis and research on green space: what about blue space and wellbeing, or water management, access, ownership, symbolism etc as one of our most important resources?
384	What stops parents from using urban greenspace as a play resource for the under fives in particular, and how would a shift in thinking contribute to reducing childhood obesity?
511	Inter society comparison of use, abuse and role of green space in urban housing. Does the UK model of house and garden ownership work against our children?
533	How critical is contact with the natural environment to healthy child development and understanding
554	Engagement in Nature through education
513	the impact of a changing climate on each ecosystem service delivered by greenspaces; an assessment of GS resilience to CC
121	Role of urbanised coastlines in human wellbeing and health
369	What does the seaside as a place of historic, economic, ecological, social and cultural significance in the UK tell us about what we value?
379	Marine Environment and Human Health and Wellbeing - going beyond recreational use
439	Airborne pollution from increased shipping traffic.
61	Understanding how ideas about the value of green spaces or 'natural' spaces are constructed culturally, and what (possibly negative) values are attributed therefore to other kinds of spaces, which are grey or brown, artificial, unnatural or broken? Uncovering what kinds of social and cultural roles and relationships are reinforced (or challenged) through these constructions of green spaces.
217	Understanding soft outcomes and 'intangible' legacies of projects that reconnect people with nature
326	great understanding of 'how' various cultural ecosystem services are provided by greenspaces and therefore how these can be managed for and valued
332	Interactions between environment and person factors like beliefs on behaviour
457	Understanding and integrating the economic value of cultural heritage within an ecosystems-based consideration of urban greenspace.
458	Finding ways to increase connection to nature, in order to bring about pro-social, pro-environmental behaviours and wellbeing.
470	people's relationships with greenspace and nature are complex and change over the life course - qualitative as well as quantitative data is needed to explore this complexity
479	Identifying how different people 'read' natural spaces and understand how they should be interacted with, enjoyed, used, or otherwise valued. What is the range of readings? How might these perspectives be reflected in policy discourses about the values of green spaces?
484	Behaviour change to increase connection with nature and associated health and wellbeing benefits.
518	Factors determining engagement in environmental behaviours
446	green dementia care: prevention and interventions improving quality of life and occurrence of problematic behaviour
489	Use of virtual reality to provide a safe environment to test, especially in groups with risk factors (i.e. dementia)
538	Genomic analyses at ecosystem levels
24	Indicators, Metrics, Measurement & Interpretation: challenge of aligning these across multiple disciplines in terms of health/wellbeing from urban ecosystems
112	Valuing the benefits of green infrastructure/spaces to society, either monetary or non-monetary (innovative), particularly towards well-being, biodiversity and health

297	Need more multidisciplinary research - e.g. cultural geographers, social scientists - not just medics or physical scientists who think everything can be solved by a dose of exercise.
344	integrating need-for-nature research into existing frameworks
370	Understanding public and societal values through use of a broader range of research designs and methods, including approaches from the full range of social science and arts and humanities disciplines
475	How to monitor longer term benefits to health, and evaluate these in monetary, health and community values.
105	Monetary valuation of health and wellbeing outcomes of engagement with natural environment
286	Dynamic relation between biodiversity conservation functions and vegetation cover and land uses
398	linking health and green infrastructure to wider questions of sustainable urban design
453	Examining the extent to which dual benefits for people and biodiversity can be achieved
464	Understanding of the relationship between outcomes for nature (biodiversity) and outcomes for people (health benefits). Understanding of the specific benefits of different types and qualities of greenspace
50	Use of neuroimaging methods to monitor wellbeing in and around nature
292	Novel assessments of wellbeing - phone apps for example
287	The connection between creativity and working in natural landscapes
295	Accessing real life experience of the natural environment.
473	how office worker productivity can be improved by having 'green time' during lunch breaks.
31	Brownfield sites- They are most frequent in urban and post-industrial areas. Such sites are often seen as providing an ecosystem disservice and as urban blight so their natural capital is not considered. Actually are they providing cooling, pollination and health benefits that are not being captured and how should this value be addressed in land use planning decisions to maximise sustainability through reuse of land and maintenance of ecosystem services
22	1. How does the quality and characteristics of a greenspace or other natural environment affect the benefits and level of use of a place for people's health and wellbeing? What factors (structural/habitat/species diversity/standard of maintenance/provision of facilities / promotion / staffing etc.) are most influential to attract widest use for health, exercise and wellbeing (particularly from those in greatest need)? How important is the accessibility of such sites to people's homes and how important is a coherent network of green and blue spaces, links and streets to maximise use for health and wellbeing, rather than an oasis approach of isolated sites.
63	biodiversity index and health improvements
136	Identify the value of quality, biodiverse green space to the health of people in urban areas compared to amenity grassland lacking in range of biodiversity
233	What is the link between high quality biodiversity and health and wellbeing
541	Building robust indicators of biodiversity in order to correlate with UK health data; particularly indicators of biodiversity quality
74	Identifying the mechanisms and size of distal health effects that biodiversity and ecosystem services deliver in urban environments and how these differ between urban centres at differing latitudes.
107	Longitudinal studies that show interventions have long term effect/behavioural change
165	Connecting urbanised populations to the natural environment
200	Strengthening the evidence link between the use of green spaces, increasing physical activity and improving mental health and emotional wellbeing in our whole population with a focus on inequalities.
443	Understanding motivation in relation to involvement in urban agriculture, productive landscape projects. While the mental and physical health and wellbeing outcomes of green space provision and interaction are known there is more to learn about what motivates (and demotivates) individuals, social and cultural groups, key stakeholders to engage with such spaces and to be involved in practices of growing and developing productive landscapes.

447	How does a person's experience of natural goods and services in towns and cities impact on their attitude towards the concept of natural capital and conserving the ecosystems that they rely on that are provided outside of the city (knowing that cities are net importers of services)
564	making the business case (socio-economic benefits) for investment in natural accessible greenspaces for health & other benefits - at the local level
569	Market segmentation relating to behavioural change (who benefits, how do they benefit and how can we persuade more)
146	Understand the role of urban soil (brown space) in supporting human health and well being
537	Potential of soil management to promote health through influencing climate and water in cities.
495	Innovative technologies for assessing impact of green space on health
250	To consolidate and extend qualitative and quantifiable methods, including co-research, making the case for including urban agriculture within urban ecosystems and defining its role within advancing health and wellbeing.
34	How to measure health and well-being benefits of closer interactions with nature across disciplinary fields and recognisable by policymakers?
44	how urban green spaces, particularly nature reserves, can be used to improve physical and mental well being
96	health dose-response from provision of accessible semi-natural green space
102	Research gap: Understanding the broader health benefits of exposure to greenspaces (i.e. not just physical activity but other things like immune regulation, inflammatory processes etc)
108	Mechanisms underlying health benefits of green spaces
113	specific understand of which ecosystem services are delivered by different greenspaces, how these vary between greenspace types, and the specific details of the design composition of each type of greenspace
117	Describing the mechanistic basis for the link between biodiversity and human well-being
119	Impacts of natural environment on behaviour
123	greater understanding of how habitat size, shape and position affect ecosystem services within cities
126	Understanding the interaction between 'spaces', 'practices', and 'benefits' in relation to biodiversity, greenspace, recreation, and health. There is a substantial body of evidence which has considered these aspects in isolation or single combination, but limited evidence on how they interact in a more complex system. There is in need to understand how changes to land management practices (such as increasing / decreasing biodiversity or the provision of new greenspace) impacts of people's practices, and engagement, and what effect that has on physical and mental health. Equally, how to changes in practices, via people's engagement with the environment, affect their awareness of, and attitudes towards, biodiversity. These are often complex relations, which are impacted on by other factors, but where our knowledge of the impact of changes to land management needs to be integrated in decision-making.
141	How much nature? How much and what kind of nature is optimum for promoting human wellbeing and biodiversity? Are these challenges in line? (How) can we develop urban green space to optimise both?
227	Challenging urban-rural divide
241	o The call needs to recognise that the ecosystems of urban areas are often novel and the services provided are the product of complex ecological and social systems. This means that we see high variation in land use decisions across patches that can have a high influence on the services provided. Because urban areas are typically characterised by small, heterogeneous land patches/GI features that deliver ecosystem services close around the specific characteristic of the natural feature can have significant impact. We need to develop natural capital models that include all ecologically important land uses at a small scale, which may require approaches specific to cities. To be bale to do this we need to better understand the role of biodiversity in providing benefits such as mental wellbeing or cooling i.e how much more benefit is there from a species rich grassland than amenity grassland under drought conditions or a woodland with understory vs canopy trees only.

245	Non-monetary and monetary ways of 'valuing' the less tangible aspects of health/wellbeing (e.g. sense of identity; emotional) from urban ecosystems need further development
247	differences in blue spaces compared to green
252	The role and effects of cultural heritage in the experiential and wellbeing aspects of greenspace.
264	Exploration/understanding of how individuals' characteristics/contexts affect their experience of greenspace and subsequent health benefits
274	Valuing cultural services - cultural services as so important for how society engages with the environment and yet poorly understood
279	Are air quality assessments in coastal cities biased due to the impact of the ocean and how would this influence regulatory policy? For example, what is the contribution of sea spray to PM in coastal cities?
281	Whilst improving mental health and well-being using urban greenspace, environmental involvement etc. will have a monetary aspect (e.g. savings to the NHS, lower sickness absences etc.) there will also be significant non-monetary benefits: how can we effectively measure improved social adhesion without resorting to £?
301	Using urban vegetation to Improve the mental wellbeing of urban dwellers
306	Determining the extent to which well-being causes green behaviours and lifestyles
348	How does active involvement in caring for and practical management of green space improve health and well being
349	Investigating appropriate mechanisms for health and wellbeing improvement through natural environment
354	For pollinators (and natural pests) a clear understanding of the factors required for successful nesting and over-winter survival
356	Conceptualisation of access and exposure to different types of urban green space in quantifiable terms is currently limited.
415	How to establish permanent links between cities and the wider landscape (of ecosystem services) to enhance sustainability and cross-sectoral synergies
433	Bridging enjoyment of green spaces with promotion of sustainable lifestyles
435	Cultural divide between town and country dwellers
438	Identifying activities that contribute to positive enhancement of these environmental assets
444	Improving understanding of the role of biodiversity in modulating mental and physical health and wellbeing outcomes
454	Greater understanding of the wellbeing benefits of using greenspace.
494	not enough qualitative methods evaluation of the contribution of green spaces to health and well-being. Not enough theorising about this.
510	Interventional studies on health benefits of green spaces at population level
525	What is the relative effect size of determinants that shape peoples engagement with the natural environment and how does influence their health outcomes?
536	Challenge 2 above (#356) needs to be addressed in order to address Challenge 1.
573	Determining the value of the all services provided by different land use options in urban areas e.g. creating or maintaining green space vs developing
32	Establishing the relationship between biodiversity, people's connection to nature and wellbeing.
219	How can we better understand cultural ecosystem services?
249	For different groups in society (by ethnicity, age, gender etc), opportunities and constraints (and ways of overcoming constraints) to gaining wellbeing benefits from using green space

Design and Management

23	urban nature and active and healthy ageing in the light of rising average age and rising health costs
67	Increasing opportunities for children to engage with nature and associated benefits to health and wellbeing
64	How does promoting active lifestyles through outdoor recreation need to address cultural constructions of greenspace and urban nature?
85	Maximising the benefits of greenspace to reduce the effects of heatwaves
193	How to plan and manage urban greenspace to benefit health and well-being as well as biodiversity
381	Delivering multiple benefits through improved urban design and function
46	more research on the health and wellbeing effects of green spaces in urban areas on deprived groups including a focus on green infrastructure including green walls, green roofs
76	Role of greenspace in tackling health inequalities
120	Linking social-ecological systems - an understanding of how changes in management of an ecological features influences human wellbeing
27	Exploring how interventions can influence the health and wellbeing benefits of greenspace
82	Use of cemetery land for burial - is this a waste of space
84	Strategies to increase utilisation of green space, particularly physical activity (for additive effects on well being and health) within deprived communities
91	how best to 'design' environments to enhance health and wellbeing, what are the essential characteristics of the dynamic human-environment relationship that relate to health and wellbeing
95	How do we get people outdoors and what is the evidence base on the benefits - relates to greenspace design and biodiversity as well
300	Optimum design of urban green space for health and wellbeing
331	Evaluation of the size, distance to and quality of green space needed for health benefits. Studies show that green space has health benefits but the exact size, distance to and quality that is needed is not clear
340	Improving green space in urban environments
455	In the context of resilient urban design to further research and disseminate evidence for the place making potential of urban agriculture and productive landscapes.

Mainstreaming

56	Planning for Green and Blue Infrastructure with associated quantifiable health and wellbeing benefits
285	Raising awareness of the benefits to be gained from providing children with opportunities to engage with nature
465	Integrating green or nature based wellbeing into educational, health and work spheres
124	Provide justification in monetary terms that planting more trees and using green infrastructure in urban and rural areas is of benefit to all city users and companies, and of course increases our resilience to climate change so that they invest in green infrastructure
507	Work with PHE, local health boards, Directors of Public Health and other key stakeholders to provide clear economic evidence for their interventions to improve air quality, and for economic impact of air quality in urban environments with and without intervention
335	Reuniting public health and spatial planning disciplines to harness multi-functional benefits
498	To further increase the evidence-base (in terms of health and wellbeing outcomes and comparative economic outcomes) and raise the awareness of health and social care commissioners relating to nature-based interventions for the vulnerable (often termed green care). These interventions frequently create multiple benefits, in several different areas (health, wellbeing, social inclusion, pro-environmental and healthy lifestyle behaviours) simultaneously - a factor that is often overlooked by

	single outcome measures of success currently used. This is likely to save public money in the longer term.
184	secure a fundamental shift in NHS/ health sector from treating ill people to improving wellbeing & preventing illness with the help of natural capital (GI/greenspaces)
215	Setting up intermediaries to put land owners/land managers in touch with Health sector to allow GPs to prescribe "rural skills not pills" eg for mental health or obesity issues
25	1. Putting a value on the cost saving to health budgets by connecting mental health patients with the natural environment
304	To increase the awareness of the positive health and wellbeing effects of both viewing and visiting nearby nature in order to influence planners, urban designers, LAs etc. to ensure good quality and accessible greenspaces are seen as essential elements when designing housing/ workspaces / leisure areas - for a healthier, happier population
55	Filling the research gap linking ecosystem services to built environment and spatial planning processes, policies and plans within the built environment arena. To date too much attention focussed on the Defra family and natural environment arena which has left behind the built environment professions. The current proposal has pigeon holed topics. The challenge which must be taken up is how to get ecosystem thinking into the statutory plan frameworks of the built and natural environment within which all these policy areas are developed. The current local plans are key to wider mainstreaming of ecosystem services across most of the key themes below
491	How to incorporate the health value of the environment into planning for green infrastructure
555	Construction of inter-disciplinary models and decision support systems to aid urban planners
21	Identifying how different stakeholders, institutions, sectors, communities attach social and cultural value to ecosystems, green infrastructure and productive urban landscapes and the ways in which making these value-systems more apparent can feed into decision making processes and policy formation about provision of spaces for urban agriculture/PULs and how this is related to health and wellbeing outcomes at different scales.
29	To embed urban agriculture and the wider concept of productive landscapes within policies advancing urban biodiversity health and wellbeing.
41	Translation of evidence on health benefits of greenspace into practical delivery of health outcomes
42	Communication between the urban green space and public health sectors
43	Engaging farmers and landowners on the urban fringe to value nature, restore habitats and for people in towns and adjacent farmland to interact
78	How to evidence and demonstrate the health value of the environment
79	Generating evidence of how use of urban greenspace and woodlands delivers health benefits
173	How can primary and social care funding be directed so that patients and service users take a dose of nature in urban greenspace?
198	Ownership and regulation of elements of urban ecosystems
203	Promoting awareness of the opportunities available for mental health support groups
238	The commodification of the natural environment through neoliberal discourses drawing on neoclassical economic conceptualisations of value has led to non-monetary or sociocultural values being marginalised in deliberations about ecosystems, green infrastructure and productive urban landscapes. The challenge is to understand the plurality of methodological approaches available that enable non-monetary valuations and to develop a clear understanding of what are the most appropriate methods in use in different valuation contexts. Key is how monetary and non-monetary valuation methods support decisions and policy at different scales or in different communities. Case studies of urban agricultural practices and productive landscapes may be very instructive here
239	Mapping stakeholders of urban greenspace ownership and management with a view towards improving translation of evidence into public and private sector action
246	2. Measuring from the baseline in Northern Ireland, where the cost of prescription drugs for mental health is one of the highest in Europe
251	LNPs have a clear mandate to bring the three 'pillars' of sustainable development together. However, this is a large challenge. Examples or case studies of where this is proven within the UK,

	i.e. environmental improvements having a direct financial benefit re: health costs being reduced, would be extremely helpful, to increase meaningful engagement and enable effective interventions.
253	Using the pro-social and pro-environmental effects of connection to nature to engage people in biodiversity and urban greenspace.
255	Need for new, adjusted, standardized approaches for measuring impact of the urban green spaces on health and wellbeing to be shared in the Third sector (best practice guidelines)
269	Developing strategies to bring ensure those being referred to natural environment options are appropriately matched to an activity that has the potential to benefit them
280	Investigating which groups are empowered to enact a vision for public health, civic life and so on, through green space planning and use, and which groups are targeted as beneficiaries of improvement. What role might existing distribution of land ownership play?
355	Developing an evidence base for direct health benefits of ecosystems (e.g. outdoor exercise 'on prescription')
405	Producing evidence for outdoor health interventions that the health sector considers to be as robust as RCT
407	Assurance mechanisms for long-term commitments to deliver ecosystem services
414	embedding the principles of greenspace and (blue)green infrastructure into planning and local development plans
448	To further increase the evidence-base of how nature and green spaces (particularly in urban settings) contribute to positive health and well-being outcomes and make these benefits available to policymakers and health commissioners.
449	Our evidence shows that natural environment-based public health (preventative) solutions at a population level, and treatment (therapeutic) of individual's health needs are effective and often lower cost than traditional health interventions, with the ability to offer significant savings to England's burgeoning NHS, public health and social care budgets. The challenge is working across sectors (with health, environment and planning professionals and commissioners operating very differently to varying timescales/economic models) to lead to services being commissioned, health practice changing and so on.
450	Ensuring relevance of outputs for sectors which can drive change in future practice e.g. building/construction industry, local authorities, housing associations, who can act on the findings in ways which deliver infrastructure and equitable benefits from research findings across society
452	3. Working with health professionals to design a robust methodology to measure the impact on people's mental health of connecting with the natural environment, and presenting the economic case to policy makers
467	Integrating public health and ecological information and practices
472	To ensure that those referred to a natural environment activity due to poor health have options of similar quality and feel their participation is of value to them
522	We need organisations and funding streams to be combined such that we have enough money for projects to protect or enhance our ecosystem services, for example water companies, councils, designers, NRW, SEPA and EA all need to work together as one in order to make green projects a reality. How do we promote this and make it happen as a matter of course?
526	Funding
534	Research into successful partnership working to achieve societal benefits that span health,education & social care
574	Conservation Initiatives in Urban Environments: linking universities, schools, local councils, Keep Wales/Britain Tidy, Friends Groups to install local pride in our communities by promoting cleaner streets/parks, increased biodiversity and reduced disease transmission while improving the natural aesthetics of inner city landscapes.
577	Drive forward better communication between Defra, NE & FC to fund support for providing Wellbeing in the Countryside.
580	engaging businesses and local communities to better realise and value the potential of our natural environment to support resilient and strong local communities and economies

Cross Cutting Issues

Pluralistic approach

374	The Art of Valuing Nature provides an essential perspective that is often overlooked or under-valued.
591	The Value of Atmospheric Services
196	non- monetary valuation particularly choice modelling
218	Facilitating low impact lifestyles
389	Reducing food consumption
561	Balancing work and physical activity
68	Implementation of economic and environmental accounts for biodiversity, including the economic assessment of biodiversity depletion
168	To establish strong link between Environmental Quality and Human Health and Wellbeing
392	Quantify natural elements through their properties and thus their ability to generate Value (e.g., More and more diverse waterbirds deliver more Aesthetic Value that fewer and less diverse).
6	Balance of nature (quantity,quality and diversity) and agriculture
8	Increase understanding of the public health implications of policies governing land use & biodiversity conservation.
45	change in ecosystems directly caused by humans (i.e. dam building) or nature (i.e. climate change)
293	Modelling land use optimisation to address sustainable intensification, ecological service provision and maintaining high biodiversity
431	Understanding the likely impacts of a changing climate - not only wetter but heat extremes also - and how this should influence tree planting plans now.
298	The rapid rise of woodland- ecological burial sites in UK. Is this therapeutic 'parkland' space.
26	effects from climate change on human-nature relationship
559	How the themes link to climate change
256	Coastal management
549	How is the seaside valued, by whom and to what end?
191	Finding sensitive ways of evaluating what works in terms of wellbeing and place that doesn't simply assume that a pre-existing scientifc measure(s) can be applied to a given context.
187	Mapping and monitoring land cover type and condition to inform ecosystem services valuations (e.g. by basic transfer model)
230	Use of systematic mapping techniques to identify where the knowledge/evidence gaps are in relation to prioritised questions
291	Better data on monetary value of certain service, particularly marginal values e.g. value of the contribution of pollinators to local crop production
362	Digital Image Analysis and Remote Sensing (for the above)
396	Characterising biodiversity from remote sensing images
542	Big Data Tools (to identify opportunities for positive actions, and drive human adoption of them)
547	Three-dimensional mapping of biodiversity and ecosystem services (spatial + vertical)
553	A transdisciplinary approach to research and education is required for 'capable futures' rather than sustainable development.
261	Auditing, classifying, evaluating and communicating what is 'out there'
412	Mapping the evidence base for links between the environment and human health

432	Making better use of existing research by use of robust and 'fit-for purpose' evidence synthesis methodology - such as systematic review - to address prioritised questions and coordination of this activity to ensure optimal dissemination and open access to findings
353	(How) does exposure to or interaction with nature affect the perceived (implicit, moral or utility) value of nature and behaviours that support biodiversity?
364	Recognition of the cultural complexity of our relationship to Nature and how this shapes who we are: these factors are numerous e.g.: embodied, mythological, environmental, cultural.
492	Analysing qualitative data with regards to experience of the natural environment.
180	Further work needs to be undertaken to assess the impact of future food prices. The methodology used to assign valuations to ecosystem services is too simplistic and underplays the potential impacts of future food prices.
540	How can we best design opportunities to allow for positive transformations in human and ecological health and wellbeing the future
584	public investment case for restoring natural habitats
593	greater understanding of rate of change and overall impact of creating new habitats
373	Defining 'Nature" in world that is the outcome of man made intervention.
57	Interrogating nature AS social: challenging the ontological divide between humans and 'the environment'
90	The protection of *human* diversity, as a part of biodiversity - the survival of threatened human minorities, including their cultures & languages.
99	Natural environment positioned as external to wellbeing rather than an intrinsic relation of wellbeing
311	Balancing the dominant emphasis on human benefit with that of ecological/ environmental requirements (eg being more explicit in addressing where environmental goods do not benefit people but are still important and deserving of 'rights')
575	Equality between humans an non-humans
132	interdisciplinary understanding nature-connection benefits
148	Joining up diverse research efforts to fully understand the environment and impacts of human actions
153	Delivering truly interdisciplinary research across natural and social sciences, which draws on the methods and philosophies of relevant disciplines and will provide results which resonate with experts in those disciplines. Building partnerships which cross the disciplines, but also involve cross sector input throughout the phases of a project - design and delivery of research and implementation of results into policy or practice
182	Impact of environment on wellbeing
226	interdisciplinary working (science & economics)
232	Augmenting current environmental management focused management to include social and economic aspects
235	Understanding of the mediating mechanism(s) between exposure to nature, and positive impacts on health & wellbeing
237	Co-ordinating different types of academic knowledge derived from the different ontological, epistemological and methodological approaches implied through interdisciplinary research.
310	Integrating the social alongside natural and physical sciences.
312	responding to the issues holistically
313	How to ensure research is congruent with developments in neuroscience and other relevant areas
328	Need for multi-disciplinary research across major disciplines not just within science or humanities
341	Interdisciplinary working due to funding
365	interdisciplinary - transdisciplinary
380	Reconciling economic and deep ecology discourses of sustainable development
408	Ecosystem-based Adaptation

445	How different knowledge systems (e.g. scientific, technical, experiential) can come together to create a more democratic space for finding solutions to key issues.
451	Interdisciplinary & Transdisciplinary Research Process: Working across disciplines and sectors (i.e. research, policy, practice, citizens) necessitates time & often a different set of skills which has implications for both funding resources and expected deliverables
460	More systematic opportunities for collaboration and for new research and development to link researchers and practitioners
543	Working across disciplines and with a variety of actors in order to implement new systems approaches effectively
571	Better understanding of links between ecosystem services and health and wellbeing
587	Transdisciplinarity
590	Does the ecosystem services idea need to be re-framed to better reflect cultural services drawing on disciplines such as human geography and environmental psychology?
594	Ecosystem services
134	Impact of invasive species on native fauna, in particular how this affects species richness and diversity and hence what knock-on consequences does this have on agriculture, local ecosystems and hence general benefit of interlinked environmental networks. This may include depleting all parts of our environment of important native species, including urban areas.
37	Impact of changing land management on archaeological sites
88	I think there is a real need to gather key researchers in the nature/health and wellbeing field to sort out the outcome measures issue to make sure we are all using a core set of comparable health, well-being, educational etc. outcome measures in our research. This way we can start to collate and analyse larger datasets in order to gain a much more detailed picture of links between nature, biodiversity and health and wellbeing
110	Find a universal currency that is understood by all in order that all sectors can understand the value of ecosystem services and prioritise these services appropriately
137	Theorising processes and developing indicators that mediate health and wellbeing through natural environments
154	Evaluating 'economic' benefits
158	How we can demonstrate quantified benefits
183	Different measurement tools used so lack of comparative data
190	Developing a rigorous methodology for non-monetary valuation of ecosystems services that satisfies a broad range of stakeholders
207	use of life satisfaction approach/valuation of subjective well being
208	Develop methodologies for explicitly linking natural elements and Values (e.g., how does the presence of waterbirds affect for example the aesthetic value of a catchment?)
209	Analysis of trade-offs between various ecosystem services (both natural and managed)
211	effectiveness of assessment methods
212	Longitudinal cost benefit analysis of taking ecosystem service approach versus traditional approaches/maintaining status quo.
216	How to include social scientific approaches/results?
243	2. The need for the development, recognition and adoption of consistent outcome measures and evaluation tools to enable the specific health and wellbeing outcomes, efficacy and cost-effectiveness of nature-based therapies and interventions to be measured, compared and trusted by researchers, providers, funders and commissioners.
257	Evaluating health and wellbeing outcomes where the 'control' is the 'general population' - trying to prove a positive but not by denying a cohort access to exactly the same experiences
258	Effects and success of turf stripping on chalk grassland as a planning mitigation technique
260	Lack of common measures for health outcomes

266	agreeing common measures or more consistent measures on subjective wellbeing for us across different groups and populations
267	Developing alternative methods for monetary valuation and ways to integrate the outputs from mixed method (i.e. monetary and non-monetary approaches)
299	establishing clear criteria to measure environmental gains and losses
303	Methodologies of valuation
363	Development of systems approaches to adequately identify indicators for Challenge 1
383	What are the indicators for wellbeing and how do we value them
385	how marginal changes in a specific or broad environment can be quantified and how the impact of these changes can be assessed
404	Methodologies for measuring the benefits of improvements in the water environment
419	Developing indicators to incorporate well being assessments into the ecosystem services framework
508	visual mapping shared across disciplines
514	Difficulties in measuring wellbeing especially over the short term
516	genetics and environmental change/epigenetics
519	Better linking between assets and the associated human values
529	wellbeing-sustainability links
531	Understanding how natural weather features, such as global warming, or man-made activities, such as pesticide use, impact on the microbiota and hence the host ecology, life history and ecosystems mentioned in 1 (#134) and 2 (#346) above.
545	well being measures
562	Novel ways of measuring and mapping wellbeing
172	Evaluating the pros and cons of attempts to translate financial value of any ecosystem service into a market mechanism, which is then used to `offset` public spending reductions.
175	How economic values can be inter-linked with ecosystem service science i.e. environmental values linked to economic value
177	Health & well-being (monetary & non-monetary)
550	Integrating monetary and non-monetary values, including overcoming barriers to interdisciplinary working
231	Increase understanding of how ecosystem changes can affect multiple health outcomes.
77	Developing the role of Remote Sensing & Earth observation in mapping ecosystem service and Vulnerability
487	Articulating intangible, non-monetary values of biodiversity and ecosystem processes
197	How does place inform how we value nature?
338	Relating upland peatland/carbon conservation to the alleviation of poverty and improved quality of life
66	More consistent UK-based evidence is required with studies based on larger sample sizes
98	How to make research generalisable to the whole population
188	A landscape scale evaluation on the effects of the best mitigation options for biodiversity in a rural landscape. Do we see synergy?, connectivity?, hot spots?
40	Understanding the value of nature in the role of nature in wellbeing
223	shared and social values - further definition and empirical work
224	Monetary valuation
403	Improved understanding of when to use monetary and non-monetary techniques
413	integration between monetary and non-monetary forms of valuation
418	issues with market based mechanisms
420	SOCIETAL CHANGE THROUGH REDISTRIBUTION OF PROFIT SYSTEM

422	valuation of ecosystem services and more importantly, systems to allow payments to landowners/land managers for provision of non-market benefits
423	Ethical questions related to valuation
430	Non-monetary valuation
471	Better understand the role that valuation (ecological, economic and socio-cultural) can play in decision-making and how to make valuation more relevant to decision-makers
497	Co-production of value
503	How to accurately quantify economic and societal value and impact
565	Distribution of value across stakeholders
578	Understanding non-monetary values of nature for health and well being.
572	Understanding the impact of the water environment on health and well-being

Social & cultural dimension

81	To stop thinking of health in relation to nature and walking in the medical model. New research is showing the importance of other dimensions which motivate people - e.g. space, sociability, visual culture
109	Why do different societies use the outdoors to different extents despite confounding differences in natural environment
469	human adaptation to change in ecosystems
539	Using joined up research to inform and influence cultural attitudes to environmental problems
53	mapping and understanding of the cultural landscapes
181	Relating biodiversity conservation to the alleviation of poverty and improved quality of life
189	societal (public and policy-maker) understanding and perception of ecosystem services (e.g. equation with monetization); this can be in the context of the specific themes
71	Understanding how biodiversity and ecosystem processes contribute to addressing social alienation
152	Can we find causal evidence for the impact(s) of biodiversity(loss) on human health/well-being? Specific interests in societies that face specific ecosystem-related challenges.
185	Systemic consideration of health outcomes as integral to cross-sectoral policy and planning. This would centre on promoting 'systemic solutions' (sensu Everard and McInnes, 2013) as an appropriate technology default. 'Systemic solutions' seek low-energy, ecosystem-based solution that also account for implications across a linked range of ecosystem services in societal decision-making, optimising outcomes for ecosystem integrity (and associated resilience), equity across societal sectors (ecosystem service beneficiaries) and net societal value.
501	Understanding different agendas and priorities within social system.
176	Better integration of human values into natural resource management
476	How to address divergent values of different groups of humans and non-humans coexisting in shared spaces
272	integration of cultural maps and information into policy
276	Related to the above, the way language constructs socioecological relationships e.g language drawn from economics v vocabularies and etymologies of folk language of landscape, natural processes etc
315	Focusing/Identifying on the spatial and temporal impacts of investment plans and resource management decisions in terms of social and environmental justice (who wins and who loses) .
436	Increase understanding of how socio-economic and (particularly) cultural factors affect the relationship between ecosystems and human health & well-being, and what this means for ability of future generations to respond to ecosystem change.
377	Understand the likely social impacts of policies designed to promote health and wellbeing that link to the natural environment, integrating social impact assessments with existing monetary and non-monetary environmental evaluation tools, to elicit and evaluate shared and plural values in relation

	to trade-offs and synergies between environment, health and wellbeing, and account for justice and equity concerns in evaluation
588	Spiritual aspects of connection to nature (cross-culturally and interculturally) and their impact on wellbeing
240	Translating a traditionally economic characterisation of well-being into the aspects that depict actual benefit (or hindrance) of one's quality of life (eg one may own a bicycle but how s/he uses it is what defines her/his state of well-being)
242	Develop a sound socio-economic link between nature and health/well-being, which can address the current funding crisis in the NHS as well as improves health delivery and outcomes.
375	Societal value of the natural environment
579	valuations of cultural ecosystem services
289	Acknowledging the rights of future generations to biodiversity and healthy ecosystems.

Links to decision making

169	Narrating environmental crisis, e.g. climate change, in a way that is both scientifically accurate and rhetorically effective
323	Achieve behavioural change in individuals, communities and authorities to protect and benefit from ecosystem services
275	How to incorporate the health and wellbeing value of these spaces into viable business case scenarios.
386	To deliver to private sector development (i.e. construction, EIA, SEA etc) rather than CSR and EMS
481	private sectors and human and environment health
97	effectively engaging communities
144	Involving local communities in provision of ecosystem services
149	Promoting public participation in ecosystem services assessments with a view towards improving understanding of the benefits to health and wellbeing from participation and increasing understanding of natural capital to promote public action (citizen science approach)
151	How to generate higher levels of public engagement/participation/ownership in research in this area and the related issues.
162	The Dynamics of Green Pressure Groups - their representative nature in an urban democracy
174	the development of co-created community based citizen science projects which support people to gather data which provides them with a better understanding of the role that local biodiversity and ecosystem processes play in human health and wellbeing
206	embedding the benefits and vital role of our natural environment into practical action for local communities and society
361	Establishing mediators/moderators in the relationship(s)
557	Community engagement and empowerment
83	access to statutory data from rural businesses
3	Formal prioritisation processes to identify the most pressing questions through stakeholder engagement
52	relating research evidence to policy & practice
147	Applying research to management decisions
166	Moving beyond the positivist paradigm.
179	Translating evidence into public and private decision making - the complexities of ecosystem services means that many decision makers will avoid it rather than embrace it
221	Identifying which questions for the links between the environment and human health should be prioritised
262	What is the best metric for demonstrating benefits to funders - only monetisation?

394	Analysis of key factors in ensuring that research is used for policy making
397	Getting a variety of stakeholders (practitioners, regulators, NGOs, civil society, governments, etc) to use their imagination and to recognise and promote the breadth of values nature provides
505	Moving from interdisciplinary working to trandisciplinary working across academia, policy and practice involving those interests outside the extended Defra and natural environment family. Critical to work on their thematic priorities from health and well being agenda.
512	Co-produce meaningful, pragmatic actions between individuals, communities and authorities towards protecting and enhancing ecosystem services
524	Developing closer partnerships between universities and national park authorities on this theme
201	Regulations not being enforced
567	Enforcing the action on the benefits natural capital in planning and regulatory decision-making
159	Integration of valuing of nature into health/care policy at different levels
576	Overcoming money comes first, ie the short term gain rather than long term and sustainability
204	Managing and reconciling conflicting policy objectives for health, wellbeing and the natural environment across multiple sectors, spatial and temporal scales and political boundaries
411	Encourage the NHS to think 'outside the box' to other opportunities for Service User Groups
502	promoting resilience that covers human beings, flora, fauna and the earth's physical environment
568	Decision making frameworks - integration of health and environment
210	Integrating non-monetary values into decision-making
236	How to enable non-economic value to impact on public policy development.
352	How to turn the research into policy
462	Cross-Government interdepartmental thinking/non-silo thinking
466	How to embed a culture of using a ecosystem based outcomes in different sectors such as health.
504	Constructions and positioning of responsibilities for the management of environmental relations of wellbeing and ill-health
528	Implications for shifts in the wider formal and informal policy environment if greater coherence is to be made between higher-level pro-health and wider ecosystem service commitments and the practical compulsions, inducements and assumptions that most directly drive everyday business, municipal governance and private the decisions.
560	If nature contributes to health, how can this be reflected in the national accounts?
589	Science in to Policy
54	The effective communication of risk
58	Public (subjective) understandings of ecosystem services
277	Public (subjective) opinions about the importance (non-monetary valuation) of different ecosystem services for conferring health and wellbeing
283	Creating a (positive) public understanding, valuation and appreciation of ecosystem provision / land management costs
336	Educate the public as to what ecosystem services we receive from nature, plants and animals, and how irreplaceable they are, such that they value them more highly and hence will respect, accept and promote green infrastructure, natural flood management, the planting of trees etc. The public need to understand the value of nature and realise that they must change their behaviours in order to preserve it.
544	Finding a way of telling convincing stories to both policy makers and the public about Nature's long term value that counter-balance short term economic gain.
163	A cultural shift to embrace eco- economic values is required globally, locally and personally.
199	Developing and piloting new approaches to policy and decision-making at a variety of spatial scales to take a wider range of values into account, e.g., open policy making

393	connecting high level generic research on environmental economics/ESS/valuation to something that local decision makers can apply on their patch
186	Making economic valuation more affordable and more applicable
194	Pragmatic approaches to ecosystem services valuation
205	Operationalising the use of ecosystem services
213	RESOURCE MANAGEMENT - LIMITATION OF EXPLOITATION OF EARTHS RESOURCES
318	Working with key stakeholders, Identify barriers in policy and governance that are preventing work and recommendations already done (e.g. ecosystem markets task force) from being utilised more fully. Provide the evidence to fill these gaps and move things forward
319	the lack of weaving the sustainability strategy into our wider work
325	-Addressing public health and well-being values in market mechanism which is `meaningful` for health service providers (and funders)
333	Improving the available approaches to natural resource managers in terms of a clear, coherent and usable framework
359	Using to make informed decisions that fully take in costs and benefits
390	Understanding and communicating the 'cause and effect' relationships to make decision making rational and transparent
410	Lack of knowledge and understanding and desire by those who control our largest areas of land ie councils and farmers
441	Clearer understanding in research user community as to how to best deliver effective well-being programmes to communities and target groups of people
563	Provide frameworks that enable comprehensive and transparent ecosystem management based on stakeholder Value priority, sensitivity and cost-benefit analyses, etc.
566	making it more accessible
87	Understanding methods of valuation in practice
106	the effect on our wellbeing- this costs the county a fortune at present
115	Overwhelming pressure to demonstrate monetary value of biodiversity and ecosystem services
170	Investigate economic valuation and justification of nature with respect to public health. E.g. value of green and blue space in keeping and returning people to a fit and healthy state whilst reducing burden on current health systems; the impact on mental health and economy from natural hazards and extreme events; or potential threat of emerging disease on human health (Results of ESEI could feed in here).
225	Communicating how on a practical level, preserving and sustainably exploiting the value and benefits derived from nature, should be taken into account in decision making across public and private sectors.
586	CHANGING FROM AN OIL-BASED CULTURE TO A SUSTAINABLE CULTURE

Annex D – Proposed opportunities to engage with the Programme

No	**Opportunity to engage with the Valuing Nature Programme**
1	The Collaboration for Environmental Evidence (CEE) works to build the evidence-base for environment management for the benefit of all. The CEE Thematic Group, ESHWeB (Eco-system services, health and well-being) aims to facilitate the identification and prioritisation of the most pressing research questions in this interdisciplinary field and to support and coordinate the undertaking of systematic maps and reviews to address these questions. The CEE journal, Environmental Evidence publishes systematic maps and reviews and their protocols, and these are archived into the CEE Library thus providing open access to these resources. CEE provides guidelines and templates for these evidence synthesis methodologies and can directly support review teams undertaking the work who register their reviews with CEE.
2	We could offer collaboration with a network of 100 organisations and groups that provide ecosystem services and undertake different initiatives in green spaces across London. We are a part of initiative that aims at the formation of 'Greater London National Park City' partnership that would bring together local communities, local authorities and private businesses and provide leverage to various initiatives on the ground as well as up-scale voices of local groups across London
3	Using the Solent European Marine Site as a case study Investigate coastal exploitation and the impacts/benefits (value) Datasets of temperature and extreme climatic impacts on coastal habitats
4	We are reopening an old vi centre and our first contract is post mortems of farm animals for govt disease purposes. Howver we need more activities to keep the centre open. We would welcome any work that would involve fieldwork, research , lab work in the one health field.the centre has attached 40 or more ruraly based veterinary practices, a farmers cooperative that has 8000 members and aberystwyth university, which has the internationally recognised instiatute of biological, environmental and rural sciences
5	Interested in working in partnership with researchers.
6	We are interested in steering academic research to make it aplicable in delivery of marine management and therefore use it with high impact. We are interested in both specific locations and the whole English marine area. I believe we do have datasets of interest to researchers and also have a good knowledge of the range of datasets available in England and UK. We can provide letters of support for projects that outline the importance of the work to marine management. We have useful technical expertise within the organisation that can be used to augment project teams.
7	Current projects relating to Challenge 2 Progression from VNN round 1 project Partnership projects with a renage of stakeholders.
8	Western Channel Observatory off Plymouth which encompasses coastal, estuarine and atmospheric observational opportunities.
9	(1) Site / Activities: NRW owns and manages a substantial landholding in Wales, including forests / woodlands, nature reserves, and areas associated with flood and water management. NRW is also developing 3 'trial' areas in Wales, to test the paracticalities, challenges, and benefits of the ecosystems approach. These 3 areas, plus our extensive estate, would be highly suitable for the development of case studies to inform wider research. (2) NRW is responsible for the production of a number of datasets, relating to both the natural environment and people's engagement with it. This includes the Welsh Outdoor Recreation Survey, which has used detailed questions on physical activity in greenspaces to develop a population segmentation on outdoor recreation and health. (3) NRW would be interested in providing a secondment opportunity to relevant researchers in any of the 3 key areas of the Valuing Nature Programme. Key applied research staff in social science and health would also be interested in engaging directly with the successful research groups to ensure that the work benefits from, and is utilised by, the policy / practice sectors.
10	We have a network of researchers and end-user partners working on some of these issues at an operational scale in south-east England (Kent, Sussex, Surrey, Hamphshire). The projects cover urban, peri-urban and rural areas. Sussex Community Development Association, Action in Rural Sussex, The South Downs National Park, NHS, PHE and ACE are partners and study areas include Brighton and Hove, Newhaven and Peacehaven where there is marked deprivation that might be alleviated by more green space interaction. A number of datasets might be available to share and opportunities for secondment probably exist.
11	850,000 members of the public have taken part in the Open Air Laboratories (OPAL), a UK-wide citizen science initiative encouraging anyone to get involved in science, regardless of age, background or level of ability. Through OPAL surveys, members of the public have assessed the quality of their air, soil, water, while

No	**Opportunity to engage with the Valuing Nature Programme**
	investigating the impact of climate change on species movement and monitoring the arrival of invasive pests and diseases. OPAL is seeking to adapt its suite of citizen science surveys to provide assessments of natural capital and ecosystem services and would welcome engagement with researchers to this end. OPAL has a network of 12 organisations and over 2,000 schools and has public engagement officers in place to end 2016 with mature relationships with local communities (particularly in urban, deprived areas), and could act as a broker between interested researchers and these communities.
12	We have an intervention study with urban green and impact on quality of life of fragile elderly and their informal caregivers (2015-2019). It could become a case study. It is in The Netherlands however, but the (international) Nature Assisted Health Foundation is involved.
13	I have a sound research proposal for measuring a physical resonse to being in green spaces (particulalry woodland (periurban and urban included) and the correlating change in human health and wellbeing. This would benefit most from being a collaborative piece of work between Birmingham Institute of Forestry Research (BIFoR) which has woodland to validate the methodology; a local authority wishing to validate the health benefit of (urban) green spaces and higher education science partners with measuring device technology (chlorophyll flourescence and oxygen levels).
14	Essex has long-standing experiences of research into nature and health/well-being. We have a 'green excercise' and 'green care' research team with many connections to policymakers and practitioners.
15	Natural England staff and members of the National Outdoors for All Working Group and Strategic research Group have collaborated to develop this survey submission and are keen to work closely with the VNN on this research call. In particular we would like to collaborate to ensure that the research call and evidence, case studies and practice build on work to date and not duplicate effort. We have a matrix of evidence in this field, extensive case studies, wide partnerships of practitioners, policy makers and academics. Several research projects are underway or in the pipeline (such as the mental health, sustainability and environment fellowships being developed with the Centre for Sustainable Healthcare and others) which will be suitable for the call.
16	Participate in discussions to help inform development of projects and if appropriate, to liaise with colleagues who can might be able to suggest potential case studies.
17	We are members of a current AHRC international network titled: Urban Transformations Pathways from practice to policy (http://arts.brighton.ac.uk/projects/utppp). Our multidisciplinary group includes practitioners and academics from the fields of design (urban, architectural and landscape), the arts, social sciences, policy and planning. We are an open learning and research community focusing on, “productive urban landscapes” a relatively newly defined and emerging landscape typology with strong ecological, biodiversity, health and wellbeing characteristics. A particular feature of productive landscapes is the inclusion of food producing urban agriculture sites, with community and/or commercial aims. We are interested in the way that productive landscapes can be designed and included in policy with the aim of improving urban qualities and resilience. Researching qualitative and quantifiable impacts and consequences is central to our work. The network includes live projects run by participants in the UK, Netherlands, Germany, Switzerland and France. These could provide case study sites for research and secondment opportunities for researchers provided that funding was available.
18	The Yorkshire West Local Nature Partnership is currently developing a programme of GI interventions, and other projects. We are keen to work with partners to deliver on the Health & Wellbeing agenda, and are flexible about how we do this. We have links with Water@Leeds, Born in Bradford (& through them, Bradford Trident), the Hydrocitizenship project, the Red Rose & White Rose Forest groups. We also have good relationships with various sections of the LCR LEP.
19	Our sectoral research strategy (Heritage 2020) sets out our research priorities for the next five years, within which sites the Historic England Action Plan. Some elements of the above are already integrated into these strategies, but there will be scope for identifying additional projects. In addition we would be happy to collaborate (through providing our data, expertise and advice) in the furtherance of interdisciplinary pieces of work which seek to better embed the tangible and non-tangible benefits of cultural heritage within the ecosystems approach.
20	I would be very interested in bringing an environmental psychologist perspective to this programme. I already have datasets from my multidisciplinary PhD (combining psychology with marine biology) that examined the value of nature in terms of perceptions of risks and benefits, recreational use of blue-space environments, and the psychological benefits of experiencing such environments (health & well-being, marine awareness,

No	Opportunity to engage with the Valuing Nature Programme
	connectedness to nature, and pro-environmental behaviour). Building from this related work, I have numerous ideas I would love to explore that falls perfectly within the VNP. I have experience working in interdisciplinary research teams as well as working with NGOs and industry (including the fishing industry), which I would be keen to bring in to any future research projects.
21	Happy to explore opportunities - evidence base of the benefits of being 'outdoors' and 'active' are known - the two National park Authorities are looking for practical applications and overcoming barriers to access to England's finest landscapes. Both projects have elements of green/social prescribing and engaging with GPs and CCGs;.
22	The South Downs National Park Authority is extremely interested in partnering with researchers and are happy to participate in and support any research of relevance to the South Downs National Park.
23	Here at UHI Lews Castle College campus in Stornoway, we maintain close links with the NHS Western Isles and Western Isles Health Board, having worked on many joint projects before (e.g. FP7), sharing knowledge and databases.
24	The Woodland Trust manages more than 1000 woodland sites across the UK, all of which are accessible to the public, including a mix of urban and rural. We do not carry out health interventions but would be happy for our sites to be used by others who do. We also hold that national dataset on accessible woodland in the UK.
25	We are piloting an audit of green wellbeing provision, examining modes of evaluation, funding and other challenges to practice - within local policy contexts.
26	I am the Team Leader for the Devon and Cornwall Envirot Programme Team. We fund and deliver in collaboration a programme of projects with environmental outcomes. Much of our work is in Green Infrastructure provision, water quality improvement, flood risk, habitat creation and enhancement. Our plans are evidence based and we would be interested in using existing data and future monitoring to understand causal relationships. Our aim would be to fund the delivery enhanced and more resilliant environments for people and wildlife, we need to work collaboratively to create the evidence for funders of environmental projects for human health.
27	Can offer access to local community but issue is engagement with local landowners - where to start? Some are very antagonistic to nature having pretty well trashed it on the edge of our housing estatel.
28	I am a Health Geographer, previously funded by ESRC/MRC/AHRC to work on greenspace and health projects. I am interested in working with others to extend our understandings in this area. I am part of a steering group for greenspace improvements as a mental health hospital in the North of Scotland; there is scope for research at this case study site.
29	Forest Research is the research agency of the Forestry Commission and through this relationship we excellent access to an organisation (devolved) that manages approximately 1 million hectares of land across Britain. There are opportunities to test out research and scale it up across some of this land.
30	We are care farm with over 250 disable children coming to the farm on a weekly repeat basis and would be happy to help in a any way
31	Interested in working in partnership with other researchers. Plymouth is an ideal location for exploring issues relating to urban green and blue space. PML holds various data sets that may be relevant to the exploration of impacts of marine toxins.
32	RSPB (NI) has a nature reserve in the heart of Belfast harbour. It is very close to many large offices and as such could be used by workers at lunch time. It is also close to East Belfast that has high levels of unemployment and the associated medical issues. We would be interested in working with businesses and medical practices to provide and assess the impacts of green time on workers and the unemployed. We can offer mental relaxation and physical outdoor work through volunteering.
33	Mapping of UK at >150 000 scale of landscape types based on both the natural and cultural dimensions of landscapes
34	We're developing projects on valuing flood water storage and cultural services based on work in the Loddon Catchment. This is forming the basis of a wider programme, Loddon Catchment Observatory, developed in partnership with the Environment Agency and Loddon Catchment Partnership. We're keen to work with others interested in working in the Loddon as a lowland catchment case study.
35	We currently are working on a project to develop an approach to managing urban water in a relatively small catchment. This is primarily to improve water quality and also water quantity through using sustainable drainage systems for multiple benefits. We have a good range of data for the catchment and have build good working relationships with the key organisations involved including the Environment Agency, Water Company,

No	Opportunity to engage with the Valuing Nature Programme
	council, rivers trust and others. We have also other research projects associated with this catchment such as the EPSRC Blue Green Cities project. We currently are working on a project to develop an approach to managing urban water in a relatively small catchment. The community is broken, there is virtually no amenity space, and what little there is has minimal value. There are good opportunities for developing valuable urban green space to benefit and build community cohesion and wellbeing. Working in this area with us and the local organisations and groups we have built relationships with, could make a real change to the residents by understanding and improving the local environment. This area would be ideal for developing and undertaking leading research to understand the multiple benefits associated with green urban spaces.
36	My own interest is in food, especially surplus food redistribution and the question of 'valuing food' when the complexity of supply lines separates people from the source of their food- the notion of 'connection' is often somewhat fuzzily articulated but points to the way experience of different spaces might contribute to different beliefs/valuations (from a folklorist/anthropological perspective, the VNP glossary of terms made me think of Robert Macfarlane's new glossary of 'nature' terms and the removal of words to describe nature from the Oxford Childrens Dictionary.) I come from anthropology/human geography and am interested in the way concepts from social sciences can contribute to cross-disciplinary projects such as this, as it brings a history of questioning the way we come to know through techniques of measurement, counting, ascribing value/meaning etc.
37	My group currently studies UK mosquitoes (with high human feeding rates) in the lab and field - we have an excellent field site (Dee marshes, RSPB reserve) close to the university. We are also undertaking research, joint with PHE, looking at the density of Lyme disease vectors (Ixodes ricinus ticks) across England. Volunteers will be sampling regularly in wildlife reserves. Both of these offer opportunities for further projects
38	We have recently established an atmospheric observatory in a coastal environment West of Plymouth (http://www.westernchannelobservatory.org.uk/penlee/). This will be an excellent location to conduct research projects that examine the influence of clean air masses as well as pollution sources (e.g. ships stack emissions) and upon air quality and human health in the coastal environment.
39	I would be interested in exploring various activities/ideas - there might be opportunities within the water@leeds network.
40	Research ideas on biodiversity and health Datasets and ideas for smart cities projects
41	Facilitation of practical input to research (i.e. liaison with farmers, clients and accessing sites/farms as demonstrations)
42	Warwickshire Wildlife Trust has been delivering 'Your Wild Life' for 15 months in North Solihull, an area which is high on the IMD. We have been working with people with mental ill health to actively maintain and develop green spaces in their local area. These have ranged from community gardens to allotments to areas of woodland. The participants have been monitored using WEMWEBS and GPAQQ and we have seen some excellent results which we would be able to share.
43	Wild Rumpus are interested in working in partnership with researchers looking at how nature affects wellbeing/ creativity. We have recently developed a creative residency programme in a woodland space for creatives to develop their artistic practice, which could be used as a case study for a research project. This has been borne from our experience of working in a woodland office space for 2 years, and noticing the benefits to our wellbeing and creativity.
44	* As co-director of the Centre for Decision Research at the University of Leeds (with additional affiliations at Carnegie Mellon and RAND in the US), I have gathered the relevant interdisciplinary and international teams that can tackle VNP topics, including for example public perceptions of extreme weather and climate change, preparedness for heatwaves in the UK, and mental health effects of nature scenes. I welcome new collaborations to further our understanding of VNP topics. * I have the team and expertise needed to design and conduct additional national surveys on public perceptions in different countries * I have national UK survey data on public perceptions of climate change and preparedness for heatwaves, which have been collected with funding from the ESRC and will be made publicly available. I would gladly collaborate with interested parties on secondary analyses of these data sets. * I have US survey data on public perceptions of climate change and weather, on which I will gladly conduct secondary analyses with interested parties.
45	Empirical research in Bristol and Cardiff on the relation between urban spaces, nature, and the experience of future.
46	Happy to do this around the other way - i.e. make climate research data more accessible to citizen scientists.

No	Opportunity to engage with the Valuing Nature Programme
47	As a consultancy working in this area we work with a number of private and public sector clients (BP, National Grid, Defra, Forestry Commission etc.) on non-market valuation and incorporation of ecosystem service values into decision making. We could facilitate a number of potential case studies and research projects with private sector partners who are actively interested in this area.
48	The Ecosystem Services & Poverty Alleviation project in coastal Bangladesh (ESPA Deltas - £3.8m) will be finishing in 12 months and would provide an excellent case study study for some of the issues raised above as well as other projects once concluded
49	We interested in working in partnership with researchers; we have sites that could be a case study (trails/walking/cycling routes and wildlife sites; our biological information service has data on sites, species as well as our health and wellbeing board/ service which has data on people/ health; willing to discuss secondment opportunity or opportunities linked to academic study - we have both graduates and under-graduates working on environment projects.
50	- A research platform (Wessex BESS http://www.brc.ac.uk/wessexbess/) which has three years of detailed empirical research on biodiversity and ecosystem functions and services (recreation, water quality, fish production, pollination, pest control, GHG regulation) - Long term time series data on butterfly populations (UKBMS) - Biological records and associated methods to characterise species richness across space and time in Great Britain (c. 5000 species) - A framework for identifying characteristics which promote resilient ecosystem functions
51	Yes. Working on PhD around walking and visual culture. I am also an experienced health researcher. So lots of ideas.
52	I have expertise in measuring the physical benefits of urban vegetation, especially cooling and flood prevention and am keen to collaborate with social scientists and psychologists to investigate how greenspace can be used to improve the health and welbing of people, especially in socially deprived areas.
53	I am currently working on a Wellcome-Funded project investigating the origins of our understanding of breath and breathlessness, and how these experiences are affected by the air we breathe. This has just got going in Januar 2015.
54	I would be interested in working in partnership with researchers developing methods of valuation to understand the factors that promote or inhibit the co-production of value and the creation of socially robust valuation methods.
55	Our Green Exercise Research Team is always interested in working in partnership with researchers
56	I lead an existing research cluster on resilience and regime shifts of salt marshes - a coatal ecosystem with key roles in preventing dangerous flooding and erosion events. The work includes bio-physical research, modelling of landscape change, economic valuation of ecosystem services and policy analysis. The cluster includes research fellows and PhDs and plenty of scope for knowledge transfer and synergistic research. For info: http://nrn-lcee.ac.uk/resilcoast/index.php.en
57	I have some specialist knowledge of certain endangered ethnolinguistic groups: e.g. French dialects in the Channel Islands, France & North America; French-based Creole languages of the Indian Ocean & the Caribbean.
58	Happy City Index dataset - citywide data on well-being (for Bristol, UK). Working partnerships with academics working on well-being measurement at the University of Cambridge and University of Bristol.
59	I am currently an ESPA early career research fellow conducting research on the influence of community-based conservation (forest) initiatives in Tanzania on human well-being (Rural Iringa and Kilwa Districts - 4 villages in each district, 2 with and 2 without CBFM). I could forsee my work as a kind of baseline case study that could be useful in exploring the natural disaster (ie flooding/ drought) and perhaps water-borne vectors (ie dysentary and parasitic diseases) research areas. Note that these are rural communities. Although my research focuses particularly on connections of the environment and well-being, I also attempt to more broadly characterise each community's respective well-being using participatory video. Additional data will be collected to characterise the present and near past (5 years) material (economic) state at the household level, as well as semi-structured questions to better qualify subjective aspects of well-being and those not easily described monetarily.
60	I have been working on the interplay between the physical and social sciences - how to communicate science to local residents to mitigate risks from natural and (hu)man-made disasters and develop resilient communities. So willing to offer expertise in these areas.

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61	Research design, methodologies; interdisciplinarity and in particular the interface between biomedical, social science and arts/humanities; conceptual and comparative attention to understandings of wellbeing;
62	My current work addresses the way in which ideas of Nature developed in opposition to Culture since the 1800s and the role art and visual culture has firmed that modern divide whereby Nature was pictured as "wilderness", the "great outdoors" or a resource pool that is detached and, therefore, able to be exploited by (human) Culture. From there, I am currently questioning that binary in the context of the ongoing anthropogenic ecological crisis, the Anthropocene, and the ways in which the realm of the aesthetic can help think new modes of being beyond subject/object, human/nonhuman, and Nature/Culture divides as a response to contemporary ecological anxieties.
63	1. Our work on guidance and tools from the NEAFO project provides a useful platform to engage with non usual suspects http://neat.ecosystemsknowledge.net/ 2. We have a series of ongoing case studies on health and well being associated with Birmingham (GBSLEP) and the South Downs National Park. In particular the engagement of the Local Enterprise Partnerships with this agenda is critical http://neat.ecosystemsknowledge.net/studies.html these can be built on as we featured pioneers of mainstreaming the ecosystem approach into policy and decision making. 3. I am also a member of the Royal Town Planning Institute Policy Practice and Research Committee from which the VNN research can start to engage with the planning profession. |I would also argue that the research should work with RICS, ICE, IEMA in order to bring these members into the frame. I can act as a conduit with both academic and industry respectability. 4. It is also important that the research has traction within other government departments such as DCLG BIZ and DECC. 5. My research expertise positioned between the built and natural environment professions is key USP as relatively few academics are working in this niche.
64	BGS researchers involved with volcanic studies for many years - Iceland and Monserrat may be examples. Whilst these are not on the UK mainland, worth noting that: European airspace was closed by ash from an eruption; a BIG Icelandic eruption would impact UK weather, crops etc; many of our overseas dependencies contain volcanoes; UK residents and UK companies work and travel abroad where there are volcanoes
65	we have just started to work with the rspb across our mental health and learning disabled nhs trust, always keen to broaden our work to promote holistic healing
66	Water Sensitive Urban Design approaches can address drought and flooding whilst considering the multiple benefits for urban cooling, amenity etc. Ricardo-AEA have experience exploring these areas with projects for Forest Research, local authorities and international government. We have also been developing business cases for improved water management, identifying beneficiaries and opportunities for partnership funding,
67	Here in CREAL, we have in-house expertise (e.g. we are coordinating EC-funded project PHENOTYPE studying the health effects of green spaces in European populations) and a wide range of datasets useful to study health effects of green spaces and extreme weather conditions.
68	I am interested in what appears to be different sets of attitudes to the use of the outdoors in northern Europe from Southern and Western Europe. I am a natural scientist and I have social and natural science contacts here at Essex, Sweden and Norway who would be interested in this question. Hunters interact intensively with natural habitats and animals. Both in terms of exposing themselves to vectors through spending more time in high rish areas, i.e. dusk on saltmarsh increases mosquito exposure and crawling through fields towards deer increases exposure to ticks. I have research networks across the study of hunted species and across UK and European hunting research and representation organisations. I have experience of working with the ecology and distribution of Ixodes ticks and have research contacts in this area in the UK and Sweden. This last challenge is just a question that intrigued me having moved from Sweden to the UK. There appears to be high investment in urban green space across Swedish cities for use by all ages. This integrated planning appears gratuitous at best in the UK. I would like to see more focus on coastal and aquatic spaces and their role in wellbeing.
69	Working in partnership. Working with our River Watch (volunteer community) groups to assess the benefits they derive from achieving practical solutions to their river catchment related issues - eg constructing natural flood management interventions to protect their homes, managing invasive species on their river bank, monitoring the impact of their river and their work, having appropriate consultation and communication with statutory authorities brokered through Tyne Rivers Trust.
70	We have sites (and some data) which would be valuable in pursuit of callenges 1 and 2 above and would be happy to engage with others towards addressing these objectives

No	Opportunity to engage with the Valuing Nature Programme
71	I would be interested in pursuing a joint partnership research project. My department and research centre has expertise in the field of public health and well-being in relation to access to urban green space. I would be particularly interested in teaming up with economists who wish to explore whether it is possible (or not) to develop market mechanisms to address these values. However, I am also interested in evaluating whether this is a reasonable, effective and efficient thing to do - or just an excuse to withdraw public funding of the proper maintenance the public realm?? It would be good to see if examples of good practice exist - or is it still just a `conceptual debate`??
72	To date we have worked in partnership to carry out several research projects on Citizen Science as well as projects on the impact of volunteering. We have a substantial reach into communities and across volunteering networks and can effectively interest subjects to participate in research. We are particularly interested in exploring the relationship between personal, community and ecological resilience as well as participating in research that would support more effective local participation in environmental citizenship and decision making
73	We can provide multiple sites for research (3 zoological/botanical collections/attractions), a national nature reserve and 2 local nature reserves/urban green spaces and we could provide a secondment. We would be especially interested in how visiting our sites influences health and wellbeing of our visitors
74	I'm a marine ecosystem modeller and I can provide a suite of modelling tool to study HABs, their habitat and the likelihood of occurrence (e.g. Glibert et al., Global Change Biology, 2014) and production of toxins from algae. I have experience also on working with socio-economist on monetary and non-monetary evaluation of HABs
75	I am working in a number of research proposals on green space and health that collect data and could be used for further analyses (e.g. www.phenotype.eu)
76	Research expertise on determinants of behaviour and behaviour change. Links to Bradford trident project making changes to green space.
77	Yes. I currently work with the University of Nottingham and the Thames Estuary Partnership on a small pilot natural resource planning/management project. The project has made some important first steps in terms of integrating with a set of key stakeholders, initial data capture, and development several planning tools/components of a broader approach. The project could be very easily up-scaled to directly address the key challenges listed above and could provide an excellent case study with interdisciplinary research to ultimately provide management that meets clearly and appropriately defined stakeholder value expectations.
78	There are a variety of excellent sites for case studies that preliminary work has been done from a natural science and engineering perspective that would benefit from a broader interdisciplinary investigation involving valuation and socio-economic and arts perspectives. These stem from previous EU and Esmee Fairbairn Foundation funded projects(DELOS, THESEUS, URBANE)
79	1. Partnership in research based on practical engagement with local government 2. Provide case study materials from TCPA projects on health, green infrastructure, climate change, and planning 3. Potential for placements/ secondments within TCPA or vice versa.
80	Broadly, the entire National Park, which is a IUCN Category V protected landscape managed in accordance with IUCN management principles Range of site- and area-based biodiversity conservation, access and rights of way, education, community development and visitor management projects that would serve very well as potential case studies, including upland commons and moorland. Speak to me for more details (remind me that I've suggested this!). 90% of Cardiff's drinking water is sourced from this National Park and over 70% of Swansea's.
81	Access to the Monitor of Engagement with the Natural Environment (MENE) data set and facilities to add to additional questions / responses to the omnibus survey. Would be happy to work with the VPN to enhance the transfer of knowledge to the practice and policy communities, and to increase the impact of research.
82	I would be happy to help guide researchers in their work to address the key challenges I've identified, and could provide access to a network of contacts in the public, private and voluntary sector in Wales. I can also provide links to the UNESCO Man and the Biosphere programme, and to IUCN's Urban Specialist Group.
83	I have worked personally on ecosystem services (and predecessor concepts) since the late 1980s, in research, international development and also developed world policy contexts. The identification and integration of health-relevant, ecosystem service-mediated implications is a key strength I can bring to the programme (and on which I have published with colleagues). I have also work on VNN (Valuing Nature Network) projects, and in a former role on the 2011 Natural Environment White Paper and the Defra PES programme, so the broader

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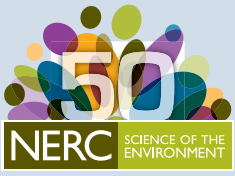
	UK context including valuation is something in which I have experience. As part of a team at the University of the West of England (UWE), I also work with colleagues specialising in public health, flooding and droughts, air quality and water resources. My role on the Ramsar Convention STRP (Scientific and Technical Review Panel) reflects my expertise and networks with respect to the role of wetlands in multiple dimensions of human wellbeing, including physical and mental health. Colleagues with whom I work also and would bring into a consortium work on UN Habitats projects on wetlands and water cities and global cities, and also on disaster resilience in which ecosystems play key roles.
84	Research partnerships (I'm currently a Senior Lecturer at the Open University, linked to psychology and human geography research areas)
85	The Forestry Commission has engaged in a wide range of practical projects related to health and well-being from greenspace - I can provide introductions to relevant FC staff The FC has monitoring data of sites designed to reduce flood risk Secondment opportunities may be possible - I would need to investigate
86	There are a number of groups researching UK ladybirds which would be an excellent model for investigating the topics I describe above. This includes involving the general public in surveying as well as specialist researchers in sample analysis. It could include researchers at Universities, research institutes as well as amateur naturalists, school children, gardeners and so on.
87	Access to green space data which cover the entire UK at a fine spatial scale.
88	We can offer projects to assess as case studies, working in urban areas in Coventry and Solihull in particular with a range of ages, engaging people in caring for the natural environment. We have a project that is working with people in area of deprivation and assessing their level of well being before during and after engagement. We have active volunteer groups of 10 -20 people attending each day, 3-4 days/week that regularly undertake practical activities in the natural environment both urban and rural areas. We run both educational and informal sessions with children engaging them with the natural environment, ages 2- 18. We work in partnership with many organisations to develop and deliver active projects and wish to extend the range of health focussed schemes we run. We are working at a landscape scale to restore biodiversity and engage people in caring for their environment, on 2 major projects in North Warwickshire and Rugby/Warwick districts
89	We are currently running a 3 and half year project, Natural Connections, that seeks to embed learning in local natural environment in schools, evidencing teachers' perceived benefits across a range of health, social and education outcomes for children and young people. We also have just completed a five year project that looked at wellbeing derived from woodland activities (Good from Woods, in partnership with the Silvanus Trust and woodland organisations). This developed a set of wellbeing indicators from the literature and research conducted by practitioner - researchers.
90	Working in collaboration with other researchers, working with agricultural systems, working actively with farmers who could become case studies, data on organic land management and agroforestry, experience with knowledge transfer to end-user.
91	Currently have a White Rose funded PhD student working on green space and health. Access to local council data on green space typologies.
92	I am a soil scientist with a developing interest in urban soils (not the contaminated ones - although they are also interesting) and how they might function in cities to deliver a range of ecosystem services, including health benefits.
93	Happy to partner with the work you are doing in anyway acadmically viable, for example, we have a theoretrical framework that mat be of use.
94	I am interested in collaborating with other researchers to explore and quantify relationships between biodiversity and health; I bring research expertise in green space and mental well-being, in particular aging and particular mental health problems (e.g. autism, ADHD, depression, schizophrenia etc); also theory and methods in restorative environments and the newly emerging field of health resilience.
95	consultancy (on Quantifying Externalities; Image & Sensing Analysis; Big-Data Tools for change)
96	Have an on-going collaboration with an NGO working in theHaor flooded agro-ecosystem of NE Balngladesh that could provide a useful test-bed/case study for VNP projects. My organisation specialises in systems and ecosystem approaches, and could provide opportunities for student project work or other capacity building.
97	We could offer to host exchanges for acedemics and others to mutually address the research questions outlined above drawing upon research within New Zealand.

No	**Opportunity to engage with the Valuing Nature Programme**
98	Can offer geospatial modelling and mapping in the area of ecosystem services
99	Access to a wide variety of potential data-rich test sites, including: * Chile (existing Newton grant) * Savannas of Kruger National Park, South Africa (Royal Society grant & approved project) * Mexico (CONAFOR)
100	I have ideas about risk forecasting of vector-borne diseases and have large data sets of environmental and vector data for Scotland.
101	GiGL is London's environmental records centre and we hold detailed information relating to biodiversity in London through wildlife sightings and invasive species, and greenspace and openspace (including green infrastructure) datasets. We are very interested in research questions that involve urban greenspaces & blue spaces and are happy to work with funded projects as long as our time is covered. GiGL is a member of the Association of Local Environmental Records Centres which consists of organisations like ourselves holding biological records (and a variety of greenspace/openspace datasets) and which might be of interest to research outside of London.
102	The interdisciplinary, postgraduate educational and research programme, 'Making Our Futures': ecological arts and sustainable design', was developed in four Taiwanese and Chinese universities. It will be a new unit in Manchester School of Art and contribute to MMU's cross-faculty initiative, 'Curriculum for Sustainable Development. This would provide an excellent case study for VNP, partnership opportunities for other researchers, and a private sector secondment.
103	The School of Vet Med at Surrey has excellent collaboration with Surrey Wildlife Trusts farm at Wisley. we are eager to engage in multi-disciplinary and multi-institutional research. There are also opportunties to engage with undergraduate and post-graduate student projects
104	Experienced working with social scientists, epidemiologists, ecologists, hydrologists and economists to develop complex spatial and temporal models.
105	I am Research Manager for the IUCN's UK Peatland Programme, and we would be interested in collaborating with VNP projects that contribute towards the resilience of UK peatlands
106	I am interested in working with climate scientists and/or ecologists on the relationship between scientific accuracy and rhetorical effect in order to motivate public awareness and behavioural change on climate change
107	I chair the LWEC Health and Wellbeing Task Force and am keen to see the VNP aligning more closely with the work of this group. It would be useful to know and review where the VNP sits within the work of the LWEC and the HWTF.
108	Numerical models to investigate natural flood management Stakeholder engagement with environmental stakeholders
109	Certainly. I run the Dose of Nature project in Cornwall, a NERC-funded Knowledge Exchange partnership between the private sector, the health system and the research community. There are numerous small-scale practitioner members who would, either singly or together, make excellent case studies for further research. At the same time we are looking to work this summer with various elements of the NHS to develop a new joint project which, if funded, would be an excellent secondment opportunity. To make this work I need to work with more researchers, for example from within health economics, and I am very keen to make further collaborations within the VNP network.
110	Interested in adding economic research to projects that quantify the provision of green space and human health responses.
111	I am working on a proven practice (physical activity) that reduces food consumption in humans. Reduced food consumption means reduction in requirement for physical activity to maintain physical health. In this process I have arrived at the Global framework for health related food taxes. At the moment, countries are proposing to tax various food products to stop obesity and they include Soda tax, sugar tax, chocolate tax, pastry tax, junk food tax, high salt and high sugar tax, soft drinks tax, ice cream tax etc. There were bans on big soda cups in New York. There is still discussions on taxing food supplied in big portions and taxing marketing efforts to children in form of gifts and toys. I have simplified them all in to one single tax called tickle tax, a tax on business behaviour of tickling food consumption.
112	I have published books and papers on abiotic ecosystem services and on the many ways in which geodiversity is of value to society, including in terms of health and well-being. I would be happy to contribute policy advice in these areas.

No	**Opportunity to engage with the Valuing Nature Programme**
113	Working partnerships with other researchers. Provide a case study research project - see www.cycleboom.org Provide data (subject to permission from participants and Research Councils) Provide secondment opportunity for someone who wanted to bring something to the cycle BOOM project.
114	Expertise in Data-driven environmental planning and policy design from a data perspective. Strong track record in multidisciplinary work, e.g., combining qualitative data (e.g., stakeholder opinion) and quantitative data (e.g., species diversity, groundwater levels). Purpose-built software and web-platforms. Tools and processes for comprehensive stakeholder and expert data capture. Tools and algorithms for capturing, processing and representing Uncertainty in data.
115	Wild Oxfordshire (WO) supports and co-ordinates the Oxfordshire Nature Partnership. There are existing aspirations amongst partners (including Centre for Sustainable Healthcare, Oxford Brookes and Oxford University/ ECI) to do projects relevant to call. This includes a "Health and the Natural Environment" project and Green Infrastructure (scoping stage). We are also interested in developing a Natural Capital Audit for the Upper Thames. We can facilitate the access to relevant groups (e.g. green gymns & healthy walking) and projects or sites that could act as case studies or demonstration and pilot projects.
116	I would be interested in working in partnership with other researchers. I have various activities in mind but one that could relate directly to this call will be economic value of ecosystem services from urban forests of Bhopal, India. I do have some associated data for exploratory analysis.
117	Ecosystem valuation is really essential to New Zealand but the understanding and funding is limited
118	Always happy to work with others. Have 30 years experience in mapping from remote sensing, especially land cover mapping. Have used this to drive basic transfer model approach of ecosystem services valuations to stress the need for accurate maps but also the need for validated maps (as can make accurate valuations from inaccurate maps). Can easily get access to a range of data sets, especially if satellite imagery to be used.
119	I have over 20 years' of experience in trying to recognise, capture and integrate the value of nature (and especially for wetland ecosystems) into decision-making. I am currently delivering a national training programme to the Environment Agency on 'Adopting an ecosystem approach to deliver multiple benefits'; I have written guidance for Ramsar and UN Habitat on how to itegrate the value of nature into decision-making, with a particular emphasis on urban environments; I am regularly involved in practical and policy-based projects where the ability to value nature is a core activity. I would be happy to share more details of these and other activities as required.
120	Forestry Research (an agency of the Forestry Commission) has data, evidence, case studies and social scientists that could be used to work in partnership. Previous research available online
121	I can discuss possible provision of flood risk data.
122	Contact: - the Glasgow Clyde Valley Green Network Patnership - the Central Scotland Green Network and - the Ediburgh Living Landscape initiative (led by Scottish Wildlife Trust and City of Edinburgh Council)
123	We would be interesting in providing study sites e.g urban green spaces and participating in collection of data on outdoor based health and wellbeing programmes. Potentially multiple Wildlife Trusts in the UK could offer the same.
124	Challenge 1 and 2 - interested in actively establishing relevant research projects in partnership with other researchers and govt organisations Challenge 3 - community adjacent to our University would be ideal site to test this initiative
125	The work on ecosystem services and valuing nature tends to ignore the legal dimension which is vital in converting many of the ideas into practice, e.g. who is entitled to be paid for ecosystem services when several parties have an interest in the relevant land, how can long-term provision of ecosystem services be ensured, and who is liable in the event of a failure to deliver?
126	I'm in the process of constructing a temporary structure on my urban micro-farm which is situated on my allotment. The plan is to provide a demonstration model of an urban very low impact lifestyle. I'm happy to work with others on this project.
127	I have a 12 acre site which could be used for a research project and to show that simple actions improve nature
128	Am interested in working in partnership with researchers, particularly within Cardiff University.
129	We have a large woodland site that is able to provide for a range of activities and accommodates all of the necessary requirements for Carer Groups with adults or children in the field of mental health. We would be

No	Opportunity to engage with the Valuing Nature Programme
	interested to work in partnership with researchers in conduction a case study or on site demonstration of the available resources.
130	I am a methods specialist interested in identifying, quality appraising and synthesising all relevant evidence on particular policy relevant research topics. I use systematic review and evidence synthesis methods - I have a particular interest in complex interventions and using mixed methods - quantitative and qualitative - in synthesis.
131	Research
132	I am very interested in developing any of the research ideas stated above in the key challenges.
133	NEF research on wellbeing, wellbeing and nature, and some of our training materials
134	COASTAL SEDIMENT EROSION AND FLOODING CAN BE MEDIATED THROUGH BIOLOGICAL PROCESSES STARTING WITH MICROALGAE AND CULMINATING IN SEDIMENT BSTABILISATION AND SALTMARSH REGENERATION (MANAGED REALIGNMENT) THIS IS PART OF MY RESEARCH. VALORISATION OF THIS ECOSYSTEM SERVICE IS ESSENTIAL.
135	I am a university-based researcher currently undertaking a systematic meta-analysis of evaluation reports of nature-reconnection projects, looking both at the predefined indicators of success (i.e. outcomes valued by project planners) and other outcomes reported in qualitative evaluation (i.e. outcomes valued by participants). I also have connections with, and will shortly be hosting a workshop for, three prominent national voluntary sector organisations that are all working on 'reconnection to nature' as a high priority. The aim of the workshop is to develop a shared evaluation framework, which could give rise to many new possibilities for community-university partnership research.
136	We have Scotland's and one of the UK's best monitored catchments (70 sq kms), the Eddleston Water, part of the Tweed UNESCO HELP basin. We have detailed and extensive physical data and monitoring of restoration of physical habitats on the one hand, and of land manager perceptions and willingness to engage with natural flood management techniques on the other. Working with Tweed Forum (the long-established participative catchment NGO) and the local Council, we have piloted ecosystem services mapping and the national Land Use strategy across the whole of the Scottish Borders, as well as within sub-catchments such as theEddleston.
137	As a Cotswolds AONB Board Member, I can say that I know the Conservation Board would welcome engagement in research relevant to how our outstanding landscape, if well managed (which may require payments to farmers/landowners) can offer a significant health enhancing experience to urban residents.
138	We have set up a Living Lab in the Mediterranean, to research and demonstrate links between ecological regeneration and economic recovery, and are happy to partner on technology proof of concept, up scaling and application, as well as more primary research. Particular interests are rebuilding soil carbon, reduction of flood and fire hazards and fostering small scale local green enterprise. We have projects ready for partnering in forests, agriculture, urban areas and marine, as this region provides a continuum linking all. We are seeking partnership via our NL office to establish operative models of cross-border collaboration on rebuilding ecosystems (think: watersheds) as a peace-building activity, capable of reducing or averting conflicts over availability, quality and access to ecosystem services.
139	I am starting pilot studies of a system that helps commercial users identify where to create which habitats to best reduce their specific and defined problem (such as water quality or flooding). Lessons from this could help the programme.

VALUING NATURE PROGRAMME



valuing-nature.net