



DEFRA NE0109: Social Research Evidence Review to Inform Natural Environment Policy

FINAL REPORT: ANNEX

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Policy Studies Institute (PSI)

In partnership with:

Centre for Rural Economy (CRE)

Land Use Consultants (LUC)



Policy Studies Institute

Defra NE0109: Social Research Evidence Review to Inform Natural Environment Policy

Annexes to the Final Report to the Department for Environment, Food and Rural Affairs.

This document presents the Annexes to the Final Report of the Defra project ‘Social Research Evidence Review to inform Natural Environment Policy’ (NE0109). This project sought to draw together relevant social research findings from a broad and diverse evidence base for Defra’s Environment and Rural Group.

This report is accompanied by the Full Project Report, a Summary Report, and three standalone Review Reports.

This research was commissioned and funded by Defra. The views expressed reflect the research findings and the authors’ interpretation; they do not necessarily reflect Defra policy.

If you have any questions about the review, please send them to:

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ANNEX 1. Policy strategy documents used in Task 1.0 (and Defra website)

This list was suggested and approved by Defra prior to commencing the overview searches.

- England Biodiversity Strategy
(<http://www.defra.gov.uk/environment/quality/biodiversity/documents/biostrategy.pdf>)
- UK Biodiversity Action Plan (http://www.ukbap.org.uk/library/Plan_LO.pdf)
- Wildlife Management Strategy (<http://www.defra.gov.uk/wildlife-pets/wildlife/management/wm-strategy.htm>)
- Soils Strategy (<http://www.defra.gov.uk/environment/quality/land/soil/documents/soil-strategy.pdf>)
- Ecosystems Approach Action Plan (<http://www.defra.gov.uk/environment/policy/natural-environ/documents/eco-actionplan.pdf>)
- Making Space for Water
(<http://www.defra.gov.uk/environment/flooding/documents/policy/strategy/strategy-response1.pdf>
and <http://www.defra.gov.uk/environment/flooding/documents/policy/strategy/strategy-update.pdf>)
- Future water: the Government's water strategy for England
(<http://www.defra.gov.uk/Environment/quality/water/strategy/pdf/future-water.pdf>)
- The Marine Strategy consultation (<http://www.defra.gov.uk/corporate/consult/msfd-legal-framework/index.htm>)
- Previous Marine Strategy (<http://www.pml.ac.uk/pdf/DEFRA%20Safeguarding%20our%20seas.pdf>).
- The Marine Bill – (summary type documents include:
<http://www.defra.gov.uk/environment/marine/documents/ourseas-2009update.pdf> and
<http://www.defra.gov.uk/environment/marine/documents/legislation/protect-marine-env-leaflet.pdf>)
- Fisheries 2027 (<http://www.defra.gov.uk/foodfarm/fisheries/documents/fisheries2027vision.pdf>).
- Charting a new course
(<http://www.defra.gov.uk/foodfarm/fisheries/documents/fisheries/newcourse.pdf>)
- The Pitt Review (http://archive.cabinetoffice.gov.uk/pittreview/thepittreview/final_report.html)
- The Government's Response to Sir Michael Pitt's Review of the summer 2007 Floods - Progress Report, December 2009 (<http://www.defra.gov.uk/environment/flooding/documents/risk/pitt-progress091215.pdf>)
- Rural strategy 2004 (<http://www.defra.gov.uk/rural/policy/strategy.htm>)
- Diversity Review
(<http://www.naturalengland.org.uk/ourwork/enjoying/outdoorsforall/diversityreview/publications/default.aspx>)
- Natural England's work for the people and landscapes
(<http://www.naturalengland.org.uk/ourwork/enjoying/default.aspx> and
<http://www.naturalengland.org.uk/ourwork/landscape/default.aspx>)
- Outdoors for All? (<http://www.defra.gov.uk/rural/documents/countryside/dap-ofa.pdf>).
- Defra's Departmental Report 2009
(<http://www.defra.gov.uk/corporate/about/how/deprep/docs/2009-deptreport.pdf>).

ANNEX 2. List of websites reviewed in Task 1.1

<p>Defra's delivery network/ govt-related sites</p>	<p>Defra: http://www.defra.gov.uk/environment/policy/natural-environ/research.htm Natural England: http://www.naturalengland.org.uk/ Forestry Commission: http://www.forestry.gov.uk/ Environment Agency: http://www.environment-agency.gov.uk/research/default.aspx Commission for Rural Communities: http://www.ruralcommunities.gov.uk/ JNCC: http://www.jncc.gov.uk/ Marine and Fisheries Agency: http://www.mfa.gov.uk/ Sustainable Development Commission: http://www.sd-commission.org.uk/ Royal Commission on Environmental Pollution: http://www.rcep.org.uk/ Foresight Land Use Futures: http://www.foresight.gov.uk/OurWork/ActiveProjects/LandUse/LandUse.asp Countryside Quality Counts: http://countryside-quality-counts.org.uk/index.html National Ecosystem Assessment (due mid-Feb i.e. use for phase II of project if relevant) EU research: http://ec.europa.eu/research/environment/index_en.cfm</p>
<p>Devolved govts and their agencies</p>	<p>Scottish govt: http://www.scotland.gov.uk/Topics/Research/About/Social-Research Scottish Natural Heritage: http://www.snh.org.uk/pubs/ SNIFFER: http://www.sniffer.org.uk/ WAG: http://www.gsr.gov.uk/about/gsr_in_gov_organisations/organisations/welsh_assembly.asp Countryside Council for Wales: http://www.ccw.gov.uk/ NIEA: http://www.ni-environment.gov.uk/</p>
<p>Academic</p>	<p>ESRC: http://www.esrc.ac.uk/ESRCInfoCentre/index.aspx NERC: http://www.nerc.ac.uk/ EPSRC: http://www.epsrc.ac.uk/default.htm ERFF: http://www.erff.org.uk/ LWEC: http://www.lwec.org.uk/ RELU: http://www.relu.ac.uk/ Centre for Environmental Management: http://www.nottingham.ac.uk/cem/ University of York: http://www.york.ac.uk/depts/eeem/research.htm Cranfield University: http://www.cranfield.ac.uk/environment/ UEA's School of Environmental Sciences: http://www.uea.ac.uk/env/ Tyndall Centre: http://www.tyndall.ac.uk/About/Tyndall-Transition-Period-2009-2010 University of Staffordshire: http://www.staffs.ac.uk/schools/sciences/geography/links/IESR/ Sustainability Research Institute, Leeds: http://www.see.leeds.ac.uk/research/sri/ Environmental Change Institute, Oxford: http://www.eci.ox.ac.uk/ Centre for Urban and Rural Ecology, Manchester: http://www.sed.manchester.ac.uk/research/cure/ Environmental Research Institute, ERI: http://www.eri.ac.uk/ Grantham Institute: http://www3.imperial.ac.uk/climatechange/research Stockholm Environment Institute: http://sei-international.org/ IEEP: http://www.ieep.eu/whatsnew/newsitem.php?item=212 Centre for Ecology and Hydrology: http://www.soils.org.uk/ Countryside and Community Research Institute: http://www.ccri.ac.uk/ UCL Hazard Research Centre (for flood risk elements): http://www.abuhrc.org/Pages/index.aspx BRASS: http://www.brass.cf.ac.uk/ University of Kent School for Anthropology and Conservation: http://www.kent.ac.uk/sac/</p>

	<p>Centre for Environment, Fisheries and Aquaculture Science: http://www.cefas.co.uk/ Lancaster Environment Centre: http://www.lec.lancs.ac.uk/ UCL Environment Institute: http://www.ucl.ac.uk/environment-institute/ University of Surrey: http://www.ces-surrey.org.uk/ University of Exeter: http://www.exeter.ac.uk/ OPENspace, Edinburgh: http://www.openspace.eca.ac.uk/ NatCen – environment: http://www.natcen.ac.uk/topic/transport-and-environment Macaulay Institute: http://www.macaulay.ac.uk/</p>
Consultant	<p>IPSOS-Mori: http://www.ipsos-mori.com/researchspecialisms/socialresearch/specareas/environment/understandingenvironmentnewsletter.aspx Eftec: http://www.eftec.co.uk/index.htm Collingwood Environmental Planning: http://www.cep.co.uk/Publications.htm Scott Wilson: http://www.scottwilson.com/default.aspx?page=0 Resources for Change: http://www.r4c.org.uk/ BMRB: http://www.bmr.co.uk/environment/ Brook Lyndhurst: http://www.brooklyndhurst.co.uk/ ADAS: http://www.adas.co.uk/</p>
Societies	<p>Royal Geographical Society: http://www.rgs.org/HomePage.htm Social Research Association: http://www.the-sra.org.uk/ British Ecological Society: http://www.britishecologicalsociety.org/ British Society of Soil Science: http://www.soils.org.uk/ Ramblers' Association: http://www.ramblers.org.uk/Home.htm</p>
Charities	<p>RSPB: http://www.rspb.org.uk/ourwork/publications.asp http://www.rspb.org.uk/ourwork/library/reports.asp?c=&t=Report&r=&start=60&end=79 WWF: http://www.worldwildlife.org/science/projects/sciencecorner.html Greenspace Scotland: http://www.greenspacescotland.org.uk/ Carnegie Trust (rural affairs): http://rural.carnegieuktrust.org.uk/ Soil Association: http://www.soilassociation.org/ Groundwork: http://www.groundwork.org.uk/publications/category/index.asp Forum for the Future: http://www.forumforthefuture.org.uk/</p>
Networks/ websites to subscribe to for updates	<p>UKNEE: http://www.eftec.co.uk/UKNEE/index.htm NRN: http://www.northernruralnetwork.co.uk/ SDRN: www.sd-research.org.uk SSN: http://www.sustainable-scotland.net/page.asp?pg=13 FCRN: http://www.fcrn.org.uk/ SuScit: http://www.suscit.org.uk/ Countryside Recreation Network: http://www.countrysiderecreation.org.uk/publications/ National Biodiversity Network: http://www.nbn.org.uk/ ESRC-GEC-PROG (jiscmail): https://www.jiscmail.ac.uk/cgi-bin/webadmin?A0=ESRC-GEC-PROG Knowledge Scotland: http://www.knowledgescotland.org/</p>

ANNEX 3. Search strategy and variations used

Search time-frame: 2000 – 2010 (but earlier relevant articles referenced where citations are followed up or reference lists examined).

Databases searched: Primary database was Web of Knowledge. Where resources allowed, additional searches were undertaken using, for example, Scopus and/or Google Scholar.

Geographical origin: The main focus was UK-based research, but sources from Europe/the US/Australia/New Zealand were also referred to where valuable transferable lessons could be drawn. The ‘marine’ policy area was the exception as this is an international issue and therefore international literature was considered to be of equal relevance. All searches were restricted to English language publications.

Search process:

a. SEARCH 1:

The first set of search terms used included those related to the *natural environment area of focus*, and were combined with the boolean operator ‘OR’. Examples of the types of terms used in the searches for each policy area include:

- Marine OR fish*
- “Land-use” OR soil
- Rural
- Flood*
- Water OR “water availability” OR “water quality” OR “Water Framework Directive” ...
- Ecosystem* OR biodiversity OR conservation OR wildlife ...
- Landscape* OR seascape* OR “geological feature” OR scenery” ...
- “Ecosystem* Approach” OR “environment* limit” OR “environment* service”...

The second set of terms (which were combined with the first in one search, using the Boolean operator AND) were those related to the policy objectives of interest. For ecosystems, for example, they included synonyms of climate change, eco-labelling, non-native species etc. For people and landscapes they included synonyms of public access and barriers to access, recreation, perceptions of change, health, well-being etc. For water, they focused on various elements of water use, supply and demand, and water contamination, pollution and run-off etc.

b. SEARCH 2 (REFINING):

The search outputs were then filtered using Web of Knowledge’s ‘refine’ tool, so as to include only those articles from relevant disciplines and from appropriate geographical origin.

Where necessary, a further filter was applied by combining (using the Boolean operator, AND) the previous search output in a search with specific social research-related terms e.g. perception* OR valu* OR attitude OR behavior OR participation OR “social learning” OR “social capital” OR consumer OR vulnerab* OR governance (to name a few).

c. SCREENING:

The resulting search outputs were screened subjectively by reading titles and abstracts to identify the most relevant articles, and by looking at citation frequency. Only the most relevant papers were read in full and their findings incorporated in the overviews.

d. FOLLOWING UP KEY CITATIONS:

Where resources allowed, key citations were followed up and the reference lists of the most recent articles were scanned in order to identify additional journals and non-journal literature such as consultancy reports, proceedings etc.

ANNEX 4. Rapid overviews of the social science literature by policy area

1. Wildlife and Biodiversity Policy

This summary paper is one of eight that reports on a rapid overview of the social science literature relevant to Defra’s Environment and Rural Group (ERG) policy areas. Together they form an output from Phase One of the Defra-funded project ‘*Social science evidence review to inform Natural Environmental policy*’ (Defra project NE0109). Whilst it is believed that these overview papers will be useful to the work of policy-makers across Defra’s delivery landscape, they are *not* intended to represent a fully comprehensive review of all existing social science literature in this policy area. The reviews were necessarily completed in three days, primarily searching the Web of Knowledge database, focusing on literature from 2000-2010, supplemented by targeted searches of key organisational websites. Search terms were developed based on relevant ERG policy objectives as identified in Government Strategy documents, produced prior to the 2010 General Election.

Wildlife and Biodiversity Policy Objectives

This overview seeks to address the wildlife and biodiversity policy objectives outlined in ‘*Working with the grain of nature*’ (England’s Biodiversity Strategy) and *the UK Biodiversity Action Plan*. An assessment of the level of social science research relevant to each of these specific policy objectives is provided in Table 1 below.

Table 1 – Assessment of the level of social science literature for each policy objective

	Policy objective	Description of relevant social science research
Significant	Community involvement in biodiversity objectives	Public understanding, attitudes and valuation of biodiversity (North East Biodiversity Forum and Natural England, 2007); influence of background; gender, ethnicity, nationality and age (ibid); conceptual and mental constructs of biodiversity (Fischer and Young, 2007); popularity of species (Bednar-Friedl et al, 2009); attitudes to environmental change (Upham et al, 2008), need for relationship-building and engagement (Fischer et al, 2005).
Some	Healthy ecosystems resilient to climate change	A case study addresses the public understanding of the need for trade-offs related to climate change and coastal issues (Tomkins, Few and Brown, 2008); willingness to pay for biodiversity in relation to climate change impacts (Pearce, 2007); research into public awareness of climate change and its effects (Whitmarsh, 2009) and the influence of the media and its portrayal of biodiversity loss from climate change (Ladle, Jepson and Whittaker, 2005).
	Management of non-native invasive species (<i>this does not take into account the more detailed objectives outlined in Defra’s Invasive Non-Native Species Framework Strategy</i>)	Negative impacts of invasive alien species on cultural and recreational features (Kettunen et al, 2009); perceptions, tolerance and concerns regarding IAS (Bardsley and Edward-Jones, 2007; Fischer and van der Wal, 2007; Barr et al, 2002); willingness to pay for management and need for stakeholder engagement (Garcia-Llorente et al, 2008); potential methods of assessing social aspects and impacts White et al, 2008); contribution of non-native species to biodiversity in urban areas (Loram, 2008).
	Understanding economic and social reasons for biodiversity degradation	As for above. Also: the extent to which individuals are engaged in decision-making (Ohl et al, 2008); the importance of trust and communication (Marshall et al, 2007).
	Building farming, food and forestry sectors that meet the needs of consumers and make a net positive contribution to the environment (focus on biodiversity, food labelling and consumer behaviour).	Comparative studies of attitudes to and investment and support for sustainable farming methods (Buller, 2008); consumer preferences (Selfa et al, 2008); and analysis of UK agri-environment schemes (Morris and Read, 2007).

Key:
Significant social science literature
Some social science literature
No or limited social science literature

An overview of the social science research

The scope and quantity of social research into biodiversity issues is quite limited overall, with the exception of research regarding community involvement in biodiversity, which is a very broad area with considerable social research available. Whilst research from overseas can provide insights into issues in the UK, there is a need for studies to build an understanding of the unique relationship between people and biodiversity which exists in the UK.

The key themes which emerge include:

- **Theme One:** Role of healthy eco-systems in climate change adaptation
- **Theme Two:** Management of non-native invasive species
- **Theme Three:** Public understanding of, and involvement in, biodiversity
- **Theme Four:** Effects of biodiversity management on social issues
- **Theme Five:** Sustainable farming and biodiversity

Theme one: Role of healthy ecosystems in climate change adaptation

Since the Millennium Ecosystem Assessment (2005), it has been widely acknowledged that biodiversity is essential for human health because it provides provisioning, regulating and supporting services¹, such as food, medicines, water and soil stabilization. The term ‘healthy eco-systems’ is anthropocentric, as it views the natural environment in terms of its benefits to humans (Hodgson, Maltby, Paetzold and Phillips, 2007). In this way, healthy ecosystems that are resilient to climate change can increase the resilience of society to climate change. However, there is limited social research available which measures people’s perspectives of healthy ecosystems and climate change adaptation, and that available is restricted to the consideration of public participation in planning and policy-making.

A key area of social research identified explores public understanding of the impacts of climate change on ecosystems and biodiversity. The findings of surveys that have assessed public awareness of climate change, and of its numerous effects (including on biodiversity) highlight that, whilst awareness of climate change has been rising over the last two decades and awareness of the term ‘climate change’ is near universal in the UK, awareness of its ecological effects are only cited by participants when prompted (Read, Bostrom, Morgan et al, 1994, Whitmarsh, 2009).

Linked to this is social research relating to public understanding and acceptance of the trade-offs made by decision-makers when trying to balance biodiversity protection with climate change mitigation and adaptation approaches. A study undertaken in Christchurch Bay, Dorset, for example employed scenario-based stakeholder engagement to highlight the need for public understanding of trade-offs relating to coastal responses to climate change (Tompkins, Few and Brown 2008). The same research team reviewed the role that public participation has played in other policy developments, and highlighted the potential

¹ As well as cultural services but there remains significant work to be done in clarifying the ‘social’ human and cultural services provided by ecosystems.

conflict between the principle of public participation, and the need for anticipatory adaptation to the uncertain effects of climate change (ibid). It may be that many similar examples exist, which could usefully be systematically reviewed to draw general lessons about public awareness and understanding of the need for such trade offs.

Pearce (2007) provides a socio-economic perspective on the international lack of adequate investment in biodiversity conservation, particularly in relation to climate change, through exploring 'willingness to pay' for biodiversity conservation.

It is important to understand what or who influences public understanding of the relationship between biodiversity, ecosystems and climate change. The media, for example, appears to play a significant role in this. One study indicates that academic research on the subject is often exaggerated in the media, making consequences sound more catastrophic than the academic articles predict, and potentially undermining public faith in science (although current predictions of climate change may make this conclusion seem somewhat dated) (Ladle, Jepson and Whittaker, 2005).

Theme two: Management of non-native invasive species

One of the Defra policy objectives identified above refers specifically to *non-native invasive species*, and as such this summary focuses on research into non-native species which are also invasive, i.e. those which spread rapidly and adversely affect the habitats they invade². An understanding of human as well as ecological responses to non-native invasive species is essential in formulating policy responses (Garcia-Llorente *et al*, 2008). Some research exists into social considerations relating to the management of invasive alien species (IAS), and this includes assessment of the various socio-economic costs and benefits of IAS, the varying effects of each type of IAS, and the scale at which these impacts are an issue. However, research into the social and cultural impacts of invasive species is largely lacking (White *et al*, 2008).

Social perspectives on the effects of IAS tend to be highly subjective; however, negative impacts on cultural services such as reduced recreational use through decreased aesthetic value have been recorded, as well as devaluing cultural landscapes through altering their key characteristics (Kettunen *et al.*, 2009). Scalera (2010) considered the 'willingness to pay' for management of IAS amongst EU citizens. Research in Spain recorded that different stakeholder groups had different perceptions and attitudes to IAS, and varying willingness to pay for eradication. This highlights the need to engage stakeholders at the outset of decision-making processes regarding IAS management (Garcia-Llorente *et al.*, 2008). In addition, research in southern Europe indicates that whilst local communities are tolerant of invasive species, there are concerns about specific impacts of these species and the need for policy to outline management of future risks (Bardsley and Edwards-Jones, 2007).

Fischer and van der Wal (2007) conducted interviews and questionnaires into public values and perceptions of the effects of an invasive non-native plant on a charismatic sea bird, the Atlantic Puffin. Barr *et al.* (2002), investigating public attitudes towards grey squirrel control, found majority support for trapping as the most acceptable method, while interviewee opinion on poisoning was divided. In Scotland, a study into perceptions of IAS eradication programmes found that men, older people and those who had previously

² This review has not explored public responses to the reintroduction of once-native species or the translocation of native species, but this may be an important social research issue to consider in future research.

heard of eradication programmes were more likely to support such control programmes. The species to be controlled also influenced levels of support (Bremner and Park, 2007).

Interesting research was undertaken into the flora associated with gardens in a range of UK cities. The study found that 70% of plant species found in gardens were non-native or alien, and that gardens in all cities had a higher species diversity than in natural habitats, due in part to human intervention to maintain alien species, despite climatic conditions. These non-native species often contribute significantly to urban biodiversity (Loram *et al.*, 2008).

Suggestions for furthering understanding of the social impacts of invasive species include integrated social, economic and environmental assessments, and the increased engagement of a range of stakeholders in decisions regarding the management of such species (White *et al.*, 2008).

Theme three: Public understanding of, and involvement in biodiversity

One of the most informative surveys into public understanding of, and involvement in, biodiversity was commissioned by the North East Biodiversity Forum and Natural England (2007). A demographically representative sample of 988 respondents was included in a survey to assess attitudes to biodiversity amongst members of the public living in North East England. The study revealed that 32% of respondents had heard the term 'biodiversity' before; lower than any other environmental term including 'sustainability' and 'global warming'. Only 9% of the total respondents correctly understood the meaning of the term 'biodiversity, i.e. as 'the variety of life' or similar, whilst 7% had some idea that it related to environmental issues such as global warming, and 6% confused the term with other terms such as 'biofuel' or 'biodegradability'. The study also revealed majority support for biodiversity by respondents, with over 80% agreeing with both the following statements:

"I agree that the world would be a more boring place without the variety of plants, animals and natural places".

"It is important that there are a wide variety of plants, animals and natural places in the North East".

Respondents generally displayed a 'passively positive' attitude to biodiversity, recognising its importance and noting its general decline internationally, but not often thinking about it. Those respondents more likely to exhibit positive attitudes towards the natural environment included urban residents, higher socio-economic groups and older respondents.

Similarly the 2010 Flash Eurobarometer on '*Attitudes of Europeans towards the issue of biodiversity*' (European Commission 2010) showed that two thirds of EU citizens were familiar with the term 'biodiversity' but 62% did not know the exact meaning of the term. More than 8 in 10 citizens felt that biodiversity loss was a *very* or *fairly* serious problem at national, European and global levels, but in terms of being personally affected by biodiversity loss, most EU citizens saw no immediate personal impact. Nonetheless, 70% of EU citizens said they personally made some effort to protect biodiversity. In contrast, 49% respondents in the 2009 Defra '*Public Attitudes and behaviours towards the environment*' tracker survey (Thornton, 2009) stated that they '*had not given biodiversity loss any thought*', and only 21% had given it a *great deal* or a *fair amount* of thought.

Fischer and Young (2007) conducted focus groups to gain an appreciation of public understanding of biodiversity in a study based in the Cairngorms National Park. This approach allowed insight into individuals' conceptual and mental constructs of biodiversity, which were found to be rich and complex

regardless of their scientific knowledge on the subject. The study also considered sections of the population affected by biodiversity management measures, and found resentment at perceived institutional failings (e.g. in positive management of popular species) was common.

Bujis *et al.* (2004) completed work at a European level to determine attitudes to biodiversity and test methods, such as deliberative focus groups and face-to-face interviews, for engaging the public in a debate on this subject. One conclusion was that biodiversity was a term that people have trouble defining, but that most can relate to the concept of biological diversity and its role.

Bednar-Friedl *et al.* (2009) undertook surveys into people's attitudes towards biodiversity change, using questionnaires distributed in a range of urban and rural areas. The study found that the strongest concerns regarded biodiversity loss at an *international* level (80%), with 70% concerned about *national* biodiversity loss, and 62% about *local* losses. Location-specific studies also provide insight into how people value biodiversity. One example is a study by Stewart *et al.* (2006) looking at which wild plants and animals are more important to the Scottish public.

Public attitudes to environmental change are explored in a 2009 selective review of theory and practice. Upham *et al* gathered evidence on the influence of nationality and ethnicity on both how individuals value the natural environment, and their propensity to visit 'natural' places in the UK. Other research summarised by the review included insights into the role of place attachment and identity in influencing responses to ecosystem, landscape and species change.

Recommendations on facilitation of conflict management, participation and social learning in relation to biodiversity conservation are provided in a theoretical review paper prepared by White *et al* (2005). The paper suggests that relationship-building and the development of a common understanding of issues is preferable to conflict management regarding biodiversity, and highlights the need to consult and engage a range of stakeholders, to ensure they feel responsible for the realisation of conservation goals.

Theme four: Relationship between biodiversity management and social issues

Considerable research exists on the subject of how biodiversity management and the maintenance of biodiversity affect social issues. The effects of biodiversity on society may be considered as two-fold: firstly, are those relating to physical health such as the role of biodiversity in absorbing air pollution, supporting and regulating ecosystem services, and disease vectors; secondly, are its more intangible effects on socio-psychological health and wellbeing, as discussed by Newton (2007) in her review on wellbeing and the natural environment. Exposure to natural spaces is believed to benefit mental and physical health (Pretty, 2007), and research has found that those with access to nature are healthier than those without (Pretty *et al.*, 2007, De Vries *et al.*, 2003). Further research on the mechanisms behind this is currently being undertaken by the Outdoor Health Network³, funded by the ESRC and MRC. This area of research is explored in more detail in the *People and Landscapes* policy area.

The effect of socio-economic issues on biodiversity degradation is addressed to some extent through Theme 3, which discusses public understanding and support for biodiversity, and factors influencing this understanding and support. There is evidence to suggest that trust and communication play an important role in encouraging the public to support and sympathise with conservation management requirements (Marshall *et al.*, 2007). Biodiversity conservation is described as a 'social dilemma' by Ohl *et al.* (2008), who

³ <http://www.outdoorshealthnetwork.co.uk/>

note that the protection of large areas for biodiversity, such as Natura 2000 sites, requires the current generation to balance their own interests with those of future generations. Where the benefits of such protected areas are perceived to be unbalanced or 'unfair' by local people, it can lead to some individuals boycotting conservation measures. There is evidence to show that if procedures are put in place that involve local stakeholders, then stakeholders may be willing to accept these 'procedural outcomes', even if it is not their preferred outcome (ibid).

Theme five: Sustainable farming and biodiversity

There is a considerable body of social research on consumer willingness-to-pay for food produced in an environmentally-friendly manner, for example, through organic farming and other environmentally assured methods of production. Much of this research has pointed to the price of food being the key determinant in purchasing decisions but with the health and environmental value of sustainable food production being important secondary considerations. This aspect of research has received increasing attention over the last seven years. However, the emphasis tends to be on environmentally sustainable methods of food production rather than specifically on production methods for biodiversity. The following three papers are offered as an indication of the type of literature available on this topic.

The Rural Economy and Land Use programme (Buller, 2008) recently published a policy note summarising social research on sustainable farming, focussing on benefits to biodiversity and appeal to consumers of quality foods. 'Eating Biodiversity' promotes the multiple benefits of 'grazing farm animals on natural grasslands to farm businesses, product quality, ecological management and human health'. The policy note refers to evidence that consumers are willing to pay for quality foods, provided they are convinced of the added value they are paying for. The policy note also identifies the types of farmer who appear to be embracing more sustainable farm management.

Research conducted in the USA (Selfa *et al.*, 2008) compares the attitudes of producers and consumers towards the environment with their behaviour in terms of the extent to which they purchase food from sustainable farms. The study finds that attitudes and behaviours are not always consistent, and that a number of sometimes competing factors influence choices in terms of supporting sustainable farming. Innovative research into the similarities between UK agri-environment schemes and Ritzer's sociological theory of 'Rationalization', which describes an approach where efficiency and control are prioritised, are explored by Morris and Reed (2007). This research employs social research to argue that agri-environment schemes are not an appropriate approach to managing nature conservation, and proposes alternative options.

This theme touches on a cross-cutting theme of relevance to many of the ERG policy areas explored within this project; the role of public understanding of, and emotional attachment to, nature in motivating their adoption of wider sustainable behaviours and lifestyles. The BeWEL network⁴, funded by the ESRC, MRC and BBSRC, is exploring this theme and is due to report by the end of this year.

Cross cutting and overlap issues

There is considerable overlap between theme one above and the *Ecosystem Approach* policy area. There is also some overlap between Theme four and the *People and Landscapes* policy area. The reader should refer to those policy areas for further discussion on the social and economic benefits of biodiversity and the natural environment.

⁴ <http://www.bewel.net/>

Description of remaining research gaps

The key gaps identified through this literature review are summarised as follows:

- Further research into public understanding of the effects of climate change on biodiversity and healthy ecosystems;
- Factors influencing whether people recognise the impacts of climate change on biodiversity;
- Research into social effects, perceptions and concerns related to non-native species in the UK;
- Social research into the social and economic circumstances which lead to environmental degradation, and how these vary in different communities;
- Understanding of factors influencing perceptions of when biodiversity degradation is acceptable/unacceptable;
- Social research into the factors that influence people's support for farming practices that promote biodiversity;
- Social research that compares the success of a range of food eco-labelling and quality farm product schemes;
- Research on when and where social priorities take precedence over biodiversity, and what social circumstances lead to biodiversity degradation.

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2. Ecosystems Approach Policy

This summary paper is one of eight that reports on a rapid overview of the social science literature relevant to Defra’s Environment and Rural Group (ERG) policy areas. Together they form an output from Phase One of the Defra-funded project ‘*Social science evidence review to inform Natural Environmental policy*’ (Defra project NE0109). Whilst it is believed that these overview papers will be useful to the work of policy-makers across Defra’s delivery landscape, they are *not* intended to represent a fully comprehensive review of all social science literature in this policy area. The reviews were necessarily completed in three days, primarily searching the Web of Knowledge database, focusing on literature from 2000-2010, supplemented by targeted searches of key organisational websites. Search terms were developed based on relevant ERG policy objectives as identified in Government Strategy documents, produced prior to the 2010 General Election.

Ecosystems Approach Policy Objectives

This overview seeks to address the Ecosystem Approach policy ‘priority areas for action’ listed in the strategy document ‘*Securing a healthy natural environment*’ (Defra, 2007). An assessment of the level of social science research relevant to each of these specific policy objectives is provided in Table 1 below.

Table 2 – Assessment of the level of social science literature for each policy objective

	Policy objective	Description of relevant social science research
	Promoting joined up working within Defra and the Defra network to deliver environmental outcomes more effectively.	This is a procedural objective for Defra and the Defra network rather than a topic for social science research.
Significant	Developing ways of valuing ecosystem services.	The valuation of ecosystems services is the most thoroughly researched aspect of an Ecosystems Approach as many see it as an essential prerequisite to operationalising the approach. As explained below, this is a specialist area not covered by this scoping review as Defra is already commissioning significant work in this area.
Some	Using case studies that demonstrate the benefits of taking an Ecosystems Approach.	A number of case studies of taking an Ecosystems Approach have been explored as part of the Defra research programme (summarised by Think-Lab, 2009). Case studies by other researchers are relevant to specific elements of an Ecosystems Approach (e.g. de Groot and Hermans, 2009 on how to develop payment schemes for environmental services). Further studies would be useful to further illustrate the benefits of the approach and illustrate the meaning of the associated terminology.
	Developing a robust evidence base.	Almost all of the social research described in this scoping review other than that relating to valuation of ecosystems services contributes to the evidence base for an Ecosystems Approach.
Limited	Identifying opportunities for mainstreaming an ecosystems approach.	Limited coverage of this policy area. How best to foster an Ecosystems Approach across national and local government and how to embed an Ecosystems Approach in existing policy frameworks are both identified as gaps in the current research.

N.B. Following the completion of the review it was highlighted that an important emerging area of interest to Natural England and Defra is the need to clarify the ‘social’ human and cultural side of the ecosystem services framework, We were unable to go back to cover this area, but it is recognised as an important area for continued social research, and will be touched upon in the second stage review on ‘Public perceptions of environmental change’.

Key:

Significant social science literature
Some social science literature
No or limited social science literature
Not answerable by social science

An overview of the social science research

The key themes which emerge from this overview include:

- **Theme One:** What aspects of the natural environment people value and why.
- **Theme Two:** How social research can be used to place a financial value on environmental services.
- **Theme Three:** How social research can help ensure equity in service delivery.
- **Theme Four:** How social research can help to secure the delivery of ecosystem services.
- **Theme Five:** How an Ecosystems Approach can be integrated into the policy process.
- **Theme Six:** How social research can be used in embedding the Ecosystems Approach.

Theme 1: What aspects of the natural environment people value and why

In adopting an Ecosystems Approach to policy-making it is important to understand the benefits that people derive from natural resource systems and how and why these vary spatially, temporally and across different sections of society. The Millennium Ecosystems Assessment (MEA, 2005) provides a widely recognised framework for describing the benefits that a healthy natural environment provides for people, categorising them as provisioning, regulating, cultural and supporting services. However, it has been highlighted that a significant gap remains in clarifying the ‘social’ human and cultural side of the MEA’s ecosystem services framework.

The RSPB (2009) highlights an important distinction to note when considering how people value the natural environment and ecosystem services; that is the distinction between the *benefits* provided by ecosystem services and the way in which those benefits are *valued*. The *benefits* are gained as a result of the provisioning, regulating and supporting services provided by an ecosystem (such as groundwater recharge, pest/disease control, floodwater detention) and tend to be gained without people necessarily being aware of them. In contrast, a *value* is something that people consciously attribute to those ecosystem service benefits.

Upham *et al.* (2009) provide a useful synthesis of social science research on public attitudes to environmental change. They conclude that the scope and quantity of research on UK attitudes to ecosystem, landscape and species change is relatively limited (attitudes to climate change and energy infrastructure are better researched) but place attachment, environmental values and ideas of what is ‘right and normal’ are closely involved in the formation of those attitudes.

Ozdemiroglu *et al.* (2006) present an outline of the existing evidence on the value to people of the natural environment and of the choice of methods that can be used to collate this evidence, distinguishing between economic and deliberative approaches. The value concept of interest to the study was not the value of the entire natural environment, but of relatively small changes in its quality or quantity. Posthumus *et al.* (2009) highlight the need to distinguish between value (pleasure, satisfaction, worth, utility), values (relative preferences, principles and criteria that guide choice), and valuation (process of deriving values).

Regular environmental surveys commissioned by Defra (e.g. Defra, 2009) provide survey evidence on the opinions and behaviour of the English public in relation to a range of issues relevant to the environment including knowledge of and attitudes towards the environment, biodiversity and green space, and wellbeing.

A study by Research Box *et al.* (2009) provides primary social research evidence on the nature of cultural services that UK rural landscapes provide and the extent to which these depend on particular landscape characteristics or features.

Choice experiments (Bienabe and Hearne, 2006) have been used to show that both residents and tourists in Costa Rica are willing to pay for nature conservation or scenic beauty, with a higher willingness to pay (WTP) for nature conservation. This and other studies (Hokby and Soderqvist, 2003) also show that WTP declines markedly with income. Related social equity issues are discussed below.

A paper by Kenwick *et al.* (2009) examines the subjective approval of various riparian buffer types by landowners and planners in the USA, and shows a preference for natural features which can deliver a variety of ecosystem services rather than the straightened channels, concrete banks and cleared vegetation which are a feature of many riparian zones in developed countries.

An exploration in two areas of Florida of the role of the natural landscape in local stakeholders' sense of attachment to their community (Clark and Stein, 2003) showed that those who frequently visit nearby public natural areas are more likely to identify with the physical-natural aspects of their locale than the social-cultural ones.

Kanowski and Williams (2009) highlight that the 'real' value (tangible benefits such as wood production) and 'imagined' value (intangible benefits such as cultural significance) of old forests are generally represented as incompatible in forest management decision making. They present empirical evidence that these values can coexist, and psychological research which suggests the 'imagined' values of forests can be just as 'real' as their material values.

Theme 2: How social research can be used to place a financial value on environmental services

Since policy decisions are often evaluated through monetary cost-benefit assessments, a calculation of the economic value of environmental services delivered by ecosystems can help to operationalise the Ecosystems Approach. This scoping review has deliberately avoided reviewing the large body of research on different approaches to economic valuation of environmental services and how the results of these can be affected by factors such as familiarity with the service or thinking time, since this is a discrete and specialist area to which we can add little value at the scoping stage of this study. A summary of criticisms of the environmental valuation research programme is offered by Shabman and Stephenson (2000).

We have sought to highlight, however, where economic valuation studies cross over into other social research themes. For example Atkinson and Mourato's (2008) work cited under the 'How social research can help ensure equity in service delivery' theme and Bienabe and Hearne's (2006) study cited in the 'What aspects of the natural environment people value and why' theme.

Theme 3: How social research can help ensure equity in service delivery

In reviewing developments in environmental cost-benefit analysis (CBA), Atkinson and Mourato (2008) note that distributional concerns have led to renewed research interest in the ways in which CBA might throw light on questions about equity in addition to the earlier focus on efficiency.

Economic analysis by Hokby and Soderqvist (2003) indicates that the benefits of environmental improvements tend to fall disproportionately to higher income groups. This suggests the need for weighting of results or at least a sensitivity analysis of how weighting would change decisions about the costs and benefits of projects that secure environmental services. The European Commission-funded (2008) study on The Economics of Ecosystems and Biodiversity (TEEB) emphasises that the consequences of biodiversity loss and ecosystem services degradation are not being shared equitably across the world. Fishermen, the rural poor and traditional societies face the most serious risks from degradation, suggesting that actually these lower income groups potentially have the most to gain from carefully designed environmental improvement initiatives. The SDRN Review on Environment and Social Justice (SDRN, 2004) shows the highly complex and varied patterns of environmental inequality within the UK context, and demonstrates that problems of environmental injustice afflict many of the UK's most deprived communities and socially excluded groups. This suggests the need for more socially informed participatory valuation exercises such as those developed in the international development field.

Social research by Pagiola *et al.* (2008) illustrates how poorer households could participate in Payments for Environmental Services (PES) schemes and thus benefit from initiatives which also deliver environmental services. Considering markets for four forest environmental services, Landell-Mills (2002) looks at how these markets are performing with respect to their impacts on the poor, identifying a number of constraints and possible ways forward.

White (2000) argues that considerations of equity should not be limited to the distribution of monetary measures such as income, but should include the distribution of scarce environmental services as well.

Theme 4: How social research can help to secure the delivery of ecosystem services

PES have become an increasingly popular instrument to translate external, non-market environmental services into financial incentives for land managers to preserve ecosystems and thus secure the supply of ecosystem services. A number of problems are encountered though in implementing PES schemes, including ensuring compliance with scheme conditions. As a novel solution to many of these problems, Ghazoul *et al.* (2009) propose a 'Landscape Labelling' approach that would be used to identify products produced from the landscape, and to publicise ecosystem service delivery as well as cultural and symbolic attributes of the landscape, as defined by local communities.

The potential for land under agricultural management to deliver environmental services is recognised by a particular form of PES, agri-environmental payments made under European Community agricultural policy. Relevant social research includes examination of factors (e.g. the degree of required change in farming practices) affecting farmers' participation rates in such schemes (Dobbs and Pretty, 2008; Dupraz *et al.*, 2003; Patrick *et al.*, 2009). The difficulties of evaluating social demand for the rural landscapes which are a product of agricultural activities have been investigated by Ferrari and Rambonilaza (2008).

Jackson *et al.* (2007) consider ways that partnerships between researchers, farmers and other stakeholders can be used to integrate ecological with socio-economic research and help evaluate ecosystem services, the tradeoffs of different management scenarios, and the potential for recognition or rewards for provision of ecosystem services.

Theme 5: How an Ecosystems Approach can be integrated into the policy process

In contrast to the large body of literature describing the Ecosystems Approach and elements of it such as environmental services provided by different ecosystems, indicators of service delivery, economic values of

services and so on, there appears to be relatively little research regarding how ecosystem service research can be integrated into the policy process. Fisher *et al.* (2008) do, however, provide a survey of the literature and the results of a questionnaire to researchers in this field. In addition, Defra let a contract in 2009 for research on 'Participatory approaches for embedding an Ecosystems Approach'. Once this project reports, it is likely to provide a review of relevant literature.

Case studies are another useful way of examining how an Ecosystems Approach can work within existing decision making frameworks. A number of theoretical or retrospective case studies were examined as part of Defra's Ecosystems Approach research programme, in four broad UK contexts. The findings, summarised by Think-Lab (2009), highlighted that an Ecosystems Approach can effectively support spatial planning, that suitable decision-making structures are in place, that some relevant tools exist (GIS, network analysis), and that stakeholder engagement is well developed. Some obstacles identified to applying an Ecosystems Approach included that it is not embedded in the English planning process, lack of suitable data at a local scale, limited focus and scope of EIA, valuation difficulties, and public consultation that is too narrow in scope.

Theme 6: How social research can be used in embedding the Ecosystems Approach

In contrast to the research themes above, which relate to the findings of social research, this theme reviews and discusses how social research methods can be used to help inform and implement an Ecosystems Approach.

An RSPB (2009) paper presents key findings from two international workshops held in 2006 which explored how an ecosystem services approach could be made operational and embedded in policy processes. Valuing ecosystem services was identified as the first step in making ecosystem services operational. Social research can usefully contribute here in identifying the range of people affected, both positively and negatively, by resource use decisions. It was noted that valuation should only be one component of a broader decision-making framework, with effective environmental management also determined by political, cultural and historical factors which social research may play a role in understanding.

Breakke and Howarth (2000) point out that there is a marked difference between economic models and social psychology in terms of assumptions about how individual wants or perceived benefits from services are determined. They illustrate how informal arguments from social science might be linked to formal models of economic behaviour.

A recurring theme is the need to use social science methodologies alongside economic valuation when assessing the benefits of environmental services. Howarth and Wilson (2006) outline an approach to deliberative valuation that is grounded in democratic theory, social psychology, and cooperative game theory, emphasizing applications to the monetary valuation of environmental services. Hodgson *et al.* (2007) explore the concept of ecosystem services as a tool for understanding relations between nature and society, helping to place scientific understanding of ecosystems in a socio-political context. In a UK context, Rouquette *et al.* (2009) compare the utility of a variety of monetary and non-monetary methods which may be deployed to 'value' nature conservation interest, noting that different methods may result in different rankings of the relative value of sites.

Broader social science can also improve the reliability of environmental valuation methods. This may involve conducting social assessments prior to the valuation task to identify stakeholder familiarity with the terminology and concepts associated with ecosystem services, and the need to give stakeholders sufficient

information and time to think when environmental goods/ecosystem functions are unfamiliar (Haines-Young and Potschin, 2009; MacMillan et al 2006).

The role of political negotiation in the development of PES schemes is often significant yet rarely explored. An analysis of case studies in the Netherlands in respect of water-related environmental services (de Groot and Hermans, 2009) showed how negotiation analysis could provide a theoretical framework to assist in scheme development. The diversity of stakeholders' motives for valuing environmental services is a source of conflict, which hinders formulation of acceptable environmental policy. Zendejdel *et al.* (2009) propose a group decision aiding methodology to improve the acceptability of the group decision through resolution of conflicts on environmental issues.

Decisions on ecosystem management can be improved by taking advantage of local ecological knowledge. Social science methods can be used to tap into resource management information that has built up over generations and to understand the dynamics of local institutions and how these produce social interactions which support sustainable management of ecosystems (Olsson and Folke, 2001).

Cross cutting and overlap issues

The Ecosystems Approach seeks to take account of the benefits and services provided to people by all plants and animals and their interactions with their physical and chemical environment. There is therefore, by definition, considerable overlap with all of Defra's natural environment policy areas and particularly with biodiversity and marine policy. For instance, determination of the benefits that people derive from the services that ecosystems provide is central to the Ecosystems Approach but also necessarily of interest in the other policy areas since those services are associated with specific aspects of the natural environment such as water purification (water availability and quality policy area) or recreation (people and landscapes policy area).

Description of remaining research gaps

Much of the social research base is focused on how best to place a financial value on the services and benefits provided by ecosystems. Beyond this narrow focus, a large number of gaps appear to exist, particularly in terms of studies conducted in a UK context, including the following:

Evidence base on the value and benefits of ecosystems and their distribution

- UK preferences for and attitudes to actual and prospective changes in ecosystems, landscapes and species. In filling this gap it will be important to avoid asking the public abstract questions since context, contingencies, trade-offs and choices are all key (Upham et al., 2009); there is the potential to re-use deliberative data gathered for other purposes.
- How to measure and represent the intangible benefits of ecosystems in terms compatible with existing criteria and indicators of sustainable land management that emphasise quantification and objectivity (Kanowski and Williams, 2009).
- An examination of the cultural services associated with urban (as opposed to rural) landscapes.
- How to take account of the fact that the values placed on environmental services can vary according to spatial scale e.g. the aesthetic and cultural values given to a landscape by those living within it may differ from the value placed on it by visitors from distant cities.
- How differences in human values across regions or countries may affect interpretation of European legislation that seeks to implement an Ecosystems Approach, for example, the 'good environmental status' sought by the Marine Strategy Directive (Mee et al., 2008).

- Distributional issues raised by the Ecosystems Approach (e.g. the social justice consequences of climate change mitigation strategies at a range of scales – international, national, local).

Support for operationalising the Ecosystems Approach.

- The need to clarify the ‘social’ human and cultural side of the ecosystem services framework, and more specifically how best to measure the wellbeing benefits that ecosystems provide (partially linked to the point above about intangible benefits).
- Governance (decision-making) issues raised by the Ecosystems Approach e.g. how best to use data gathered from deliberative and participatory methods alongside monetary valuations, overcoming the traditional reliance on figures; how to incentivise environmental managers on the ground to adopt the Ecosystems Approach.
- How to raise public awareness of the role of ecosystem services in maintaining their desired quality of life and how this would influence the values they assign to different ecosystem services.
- How to promote better communication and coordination between the gatherers and users of ecosystems data so that the emerging evidence base has practical application to policy-makers and land managers.
- How best to foster an Ecosystems Approach across national and local government e.g. through alternative measures of prosperity to GDP; policy integration tools; inclusion of Ecosystems Approach in the Treasury Green Book; alignment of Local Area Agreement targets with an Ecosystems Approach; other toolkits and case studies.
- Development of techniques to support evaluation of trade-offs between benefits/ stakeholders that arise from ecosystem management decisions.
- Identifying opportunities for synergies of interest amongst ecosystem stakeholders and investigating how to implement them e.g. delivery of water quality from appropriate land management by upland farmers also benefits water companies.
- Further case studies focusing on the difference that an Ecosystems Approach has made will be useful in embedding the approach further and promoting understanding of the terminology. The National Ecosystem Assessment will be useful in this context. (Think-Lab, 2009).

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3. Land Management and Soil Policy

This summary paper is one of eight that reports on a rapid overview of the social science literature relevant to Defra’s Environment and Rural Group (ERG) policy areas. Together they form an output from Phase One of the Defra-funded project ‘*Social science evidence review to inform Natural Environmental policy*’ (Defra project NE0109). Whilst it is believed that these overview papers will be useful to the work of policy-makers across Defra’s delivery landscape, they are not intended to represent a fully comprehensive review of all social science literature in this policy area. The reviews were necessarily completed in three days, primarily searching the Web of Knowledge database, focusing on literature from 2000-2010, supplemented by targeted searches of key organisational websites. Search terms were developed based on relevant ERG policy objectives as identified in Government Strategy documents, produced prior to the 2010 General Election.

Land Management and Soil Policy objectives

This overview seeks to address the land management and soil policy objectives outlined in Defra's 2009 Soil Strategy ‘*Safeguarding Our Soils*’ and Defra’s Departmental Report 2009. An assessment of the level of social science research relevant to each of these specific policy objectives is provided in Table 3 below:

Table 3 – Assessment of the level of social science literature for each policy objective

	Policy objective	Description of relevant social science research
Some	Better protection of agricultural soils	Some social science research focussed on soil management knowledge and how to encourage changes in practice amongst farmers and land managers
	Preventing soil pollution	Some social science research focussed on soil management knowledge and how to encourage changes in practice amongst farmers and land managers
	Effective and fair governance of common land	Some social science research focussed on how best to manage common lands in the face of multiple interests and stakeholders and how to appropriate public value from a shared resource.
Limited	Protecting and enhancing stores of soil carbon	Limited social science research linked to the management of peatlands.
	Building the resilience of soils to a changing climate	Limited social science research linked to the management of peatlands.
	Dealing with our legacy of contaminated land	Limited research looking at the importance of trust in risk communication for the management of contaminated land sites
	Monitoring changes in the state of soil	Limited research examining the use of farmers existing soil management knowledge to develop soil health checklists
	Recapturing the benefits of set-aside land	Very limited research on factors affecting farmers' choices for the management of set-aside

Key:
Significant social science literature
Some social science literature
No or limited social science literature

The amount of social science research against the spectrum of policy objectives in the area of land management and soil is generally limited. In particular, research on the association between soil and climate change, contaminated land, soil monitoring and set-aside is very limited from a social science perspective. It should be noted, however, that issues of pollution and land management practices that may have a bearing on the environment are addressed in the broader social science literature, although it may not specifically

address the issue of soils and land use. It is suggested that social science research could contribute to further research against all of the above policy objectives.

Overview of the social science research

Although limited, research on soil and land management features across diverse disciplines including natural resource and environmental management, rural studies, policy studies, geography, psychology, sociology and agricultural studies.

The key themes which emerge include:

Theme one: Soil knowledge, management and protection

Theme two: Managing commons and multi-functional land

Theme three: Social and cultural factors affecting soil management and land use

Theme one: Soil knowledge, management and protection

Much of the literature focuses on the role of knowledge, and different knowledges, in soil protection and management. Ingram and Morris (2007) argue that little research has focussed on the knowledge needs of soil management advisors. In their study they show that different advisors hold different types of knowledge, and to different extents. They distinguish between "know-what", "know-how" and "know-who" knowledge and contend that the "know-how" element of knowledge needs to be enhanced and is best achieved through the transformation of experience and the communication of tacit knowledge through personal interaction. Ingram (2008) extends this analysis to examine the interaction between "expert" and "tacit" knowledge between soil advisors and farmers. Ingram argues that scientific knowledge relies considerably on tacit knowledge for interpretation at the local level. It is also argued, however, that many farmers - whilst having good knowledge of their own soils - lack the in-depth knowledge required to implement complex approaches to soil management. This lack of knowledge is suggested as a major reason for the lack of uptake of sustainable soil management practices by farmers. Dwyer *et al.* (2007), in their study of the Soil Management Initiative, suggest that adoption of changed soil management practices depends not just on knowledge but the characteristics of the farmer. They suggest that older farmers (who are more passionate about soil) and more recent starters (prompted to consider their options due to restructuring) are the most likely to change their management practices. They further argue that farmers believe in learning from their own experience, and that small-scale field days are most effective at getting across information to farmers since they allow greater interaction and experimentation. In an Australian context it has been argued that for adequate soil management monitoring farmers need to be empowered in the monitoring process by being actively involved in the development of soil quality indicators. It is suggested that if they are to meet sustainability targets, then they need to be able to self-monitor, in ways that are familiar to them (Lobry de Brun & Abbey, 2003).

In an urban context⁵, in studies of contaminated land, the interface between "experts" and other groups has been examined not just in terms of knowledge but also in terms of trust (Eiser *et al.*, 2009). This study emphasises, again therefore, the importance of the nature of the relationship between different stakeholders in gaining acceptance or promoting change. Eiser *et al.* suggest that trust depends not just on

⁵ It should be noted that the urban context was not a primary focus for this review. Had this context been explored, it may have raised interesting social research questions around gardener's and allotment owners' attitudes towards the soil, and organic food production and consumption patterns.

the perceived quality of information provided, "but on the characteristics of the communicators, their socially defined roles, and their relationship to their audiences" (2009: 296).

Theme two: Managing commons and multifunctional land

Brown (2006) argues that the sustainable management of common lands has received little attention in the literature. Short (2000) suggests that the environmental threats facing common lands can be broken down into three broad categories: 1) those associated with the active pursuit of a single interest; 2) inadequacies within the central administration and management process, and; 3) those emanating from a decreased interest in the common by a particular user group. Short argues that the sustainable management of common lands is contingent upon their continued multifunctional use. Interestingly it is suggested that the pursuit of commons management from a single-interest environmental perspective may be equally as threatening to sustainability as a single-interest agricultural interest. Therefore, the loss of traditional collective sheep management practices in favour of solely conservation interests reduces the opportunities for sustainable management since local tacit knowledge is excluded from the management process. Where there are multiple interests on common lands, Short argues that the effectiveness and stability of governance structures (and therefore environmental management) is contingent upon the quality and nature of the relationships between different interest groups.

Brown (2006) suggests the main policy challenge arising from the need to maintain the multifunctional use of common lands lies in harmonising the broad range of values and objectives implicated in such use. Brown also highlights the growing problem of under-use of the commons and links this to structural changes in agriculture and the changing make-up of rural communities. Many incomers moving into rural communities, for instance, may gain common rights associated with the purchase of a property, but have no intention of exercising those rights.

A principal policy challenge, highlighted by Brown, is the means by which commons users can capture the public good value of common lands. The financial benefits of the commons, such as those from tourism, are not necessarily accrued by those directly responsible for the management of common lands. A similar argument is made by Rawlins and Morris (2010), who emphasise the importance of peatlands to society as a whole. In particular, they outline the carbon storage and climate change mitigation function of peatlands and, since they are often found on common lands, argue for an integrated multi-functional management approach to reconcile divergent needs, and for a greater societal understanding of their value. In addition to greater collaboration between stakeholders, Rawlins and Morris suggest there is a need for more integration between the policy regimes that have a potential influence on peatland management (e.g. farm income, biodiversity, water resources, climate regulation and flood risk management).

Theme three: Social and cultural factors affecting soil management and land use

In the literature discussed this far there is implicit recognition of the role of social and cultural factors in shaping soil and land management decisions. This point is made more explicitly in a study of the uptake of soil conservation technology amongst farmers (Knowler and Bradshaw, 2007), which highlights that financial criteria *and* a range of social factors influence technology uptake. Similarly from a land-use perspective, studies have argued for a wider social analysis of factors influencing farmers' management decisions for set-aside (Huby *et al.*, 2005), and of the role of changing societal values as a driver for land use change (Mather *et al.*, 2006). Mather *et al.*, for instance, demonstrate the increasing prevalence of "lifestyle" farmers in rural areas but acknowledge little research into the environmental and landscape impacts of such changes.

A significant piece of research examining approaches to encouraging behaviour change amongst farmers was commissioned by Defra. This study emphasises the need to recognise that farmers are not a single cultural group; a multitude of different ‘agri-cultures’ exist, each with their own concept of ‘good farming’. Changing farmer behaviours will therefore require careful targeting of farming cultures, aiming to generate status and self-esteem within the community such that farmers gain social as well as financial rewards as a result of changed practices. Also highlighted is the importance of: collectively developing solutions with farmers through an iterative and experimental process; understanding that many land managers prioritise information from locally known and credible sources, and personally relevant advice; advice and efforts to change behaviour may be influential at times of transition and in periods leading up to such moments, but may be dismissed if a farmer or farming family are ‘locked in’ (ideologically, financially or physically) to their existing system; finance is important and the adoption of new practices can be seen as risky; time and labour are major constraints upon capacity to change; and, advice is not a panacea and must be aware of its limitations (Dwyer *et al.*, 2007).

Cross cutting and overlap issues

The literature described above places particular emphasis on the importance of various different relationships for the sustainable management of soils and land. This may be in terms of relationships between advisors and farmers/land managers and the issues of sharing or transferring knowledge and gaining trust. Alternatively, the importance of relationships may arise in terms of the multifunctional use of land where a range of different interests and values converge upon a single locale and necessitates an integrated approach to sustainable management and to the appropriation of value. An overarching recommendation, therefore, is for further research on the nature of particular relationships, how relationships contribute to sustainable land management and, moreover, how those relationships can be strengthened and their potential maximised for stable structures of governance and sustainable approaches to management.

This area has many overlaps with the other ERG policy areas, including water quality and wildlife and biodiversity (with farmer practices having significant repercussions for local biodiversity and water quality levels).

Description of remaining research gaps

As outlined above, the extent of social science research pertaining to soil management is generally limited and there is scope for additional social research across the spectrum of objectives. In particular, the interest of land managers in taking up their potential roles in carbon storage and climate mitigation has been given little attention to-date. This links to suggestions of the need for more social research to better understand farmer values, motivations and decision-making in relation to managing soil for environmental objectives, and the forms of knowledge that farmers bring to bear to manage their land sustainably – focusing explicitly on the ‘whole farm’ perspective.

In addition, specific recommendations for further research arising from the literature identified include:

- Examining the knowledge needs of soil management advisors;
- How the need by farmers to earn an income off the farm affects land management (e.g. either positively in terms of allowing the continuation of “traditional management practices” or negatively in terms of stretching the time and resources the farmer is able to put into land management)

- The causes and implications of the under-use of common land (both social and environmental).
- Understanding how to capture the public goods value of common lands and to attribute this value (financial and reputational) to those responsible for their management
- How to integrate existing policy regimes that suit local conditions (for commons management)
- Examining the land use and landscape implications of the increasing prevalence of lifestyle farming

Land Management and Soil References

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4. Flood Risk Management Policy

This summary paper is one of eight that reports on a rapid overview of the social science literature relevant to Defra’s Environment and Rural Group (ERG) policy areas. Together they form an output from Phase One of the Defra-funded project ‘*Social science evidence review to inform Natural Environmental policy*’ (Defra project NE0109). Whilst it is believed that these overview papers will be useful to the work of policy-makers across Defra’s delivery landscape, they are not intended to represent a fully comprehensive review of all social science literature in this policy area. The reviews were necessarily completed in three days, primarily searching the Web of Knowledge database, focusing on literature from 2000-2010, supplemented by targeted searches of key organisational websites. Search terms were developed based on relevant ERG policy objectives as identified in Government Strategy documents, produced prior to the 2010 General Election.

Flood Risk Management Policy Objectives

This overview seeks to address the flood risk management policy objectives outlined in ‘*The Pitt Review*’, the Government response to the Pitt Review, and Defra’s Departmental Report 2009. An assessment of the level of social science research relevant to each of these specific policy objectives is provided in Table 3 above.

Table 4 – Assessment of the level of social science literature for each policy objective

	Policy objective	Description of relevant social science research
Significant	Improved planning and reduction of risk of flooding and its impacts	Move from flood protection to flood risk management considerable body of research on the role of the individual and relationships between public and private institutions
Some	Knowing when and where it will flood	Some research starting to integrate socio-economic and vulnerability characteristics into forecasting models
	Advising people on how to protect themselves, families and property	Some research on why people do not protect themselves and their property
Limited	Being rescued and cared for in an emergency	Limited research in the UK
	Staying healthy and speeding recovery	Very limited research on the significance of social networks to help develop coping strategies

Key:
Significant social science literature
Some social science literature
No or limited social science literature

An overview of the social science research

Recent flooding-related social science research has been driven by a number of factors, including: a series of severe floods in the UK over the past 15 years; the rapidly increasing cost of flood damage; the need to meet EU Directives; and the uncertainty of future climate change impacts (such drivers are apparent in a number of key references, such as: Institute of Civil Engineers, 2001; ODPM, 2002; Defra, 2004; The Pitt Review, 2008). There is a considerable body of literature associated with the social science of flooding, which ranges in scale; micro-level analyses focus on individuals within households (e.g. Carroll and Morbey, 2009, Tapsell

and Tunstall, 2003), whilst macro-level analyses consider the national and international concerns, particularly in light of the predicted increases in flooding with future climate change (e.g. Evans et al 2008). A significant driver behind the growth of this research interest in the UK has been the shift in policy focus from delivering flood protection through structural and engineering projects, to more holistic flood risk management approaches (Penning-Roswell and Wilson, 2006; Werritty, 2005).

There is increasing awareness that technical solutions alone are insufficient to determine risk and that assessments of both the hazard and vulnerability to that hazard need to draw upon the natural and social sciences (Brown and Damery, 2002). Flood risks can be calculated as the combination of the probability of the hazard and the vulnerability of the exposed population. Analysis of the social science and interdisciplinary literature around flooding has identified four key themes:

- **Theme one:** The social justice aspects of flood risk management
- **Theme two:** The relative role of public and private institutions in flood risk management
- **Theme three:** The relationship between local experience and the government /national agencies
- **Theme four:** Reducing vulnerability and building resilience and resistance.

Theme one: The social justice aspects of flood risk management

The development of increasingly sophisticated models of flood hazard illustrate the spatial threat from flooding and, when combined with the use of property information can, to some extent, help to identify who may get flooded and how badly they may be affected by flooding (Brown and Damery, 2002). However, Parker (2004) argues that flood forecasting, warnings and response systems need to be more carefully designed from a social perspective to help protect those who are most vulnerable to the impact of flood events. A number of studies have shown that socio-economic and demographic characteristics are significant determinants of vulnerability to floods. Fielding (2007), for example, highlights the existence of flood risk inequalities across England and Wales when comparing more deprived groups with the middle and upper classes. She demonstrates that overall inequality is reproduced within fluvial and tidal flood plains, and that this is particularly pronounced in the Eastern regions of England. She questions whether this is genuinely discriminatory and proposes a need to investigate further the ways in which neighbourhoods are formed and the effects of migration. She notes the limitations of the study and suggests further explanation is needed of the link between social justice, space and inequality. In an earlier study linking environmental inequality to flood hazard, Fielding and Burningham (2005) demonstrate that different methods can produce different results. Similarly, Walker (2009) calls for a much richer understanding of social justice if we are to link space and distribution to environmental hazard.

Haynes *et al.* (2007) argue that socio-economic exposure should be included in proposed floodplain development and that this would provide information relevant to emergency services, planning, insurance companies and government agencies. There is evidence of a disproportionate concentration of social housing, hospitals and old people's homes in high risk areas reflecting the very high insurance premiums or the lack of insurance available in areas of high flood risk. Many disadvantaged groups tend not to have household insurance, particularly when renting, which both enhances their vulnerability to immediate economic losses from flooding but also compromises their ability to recover losses after the flood event.

The effects of flooding may differ significantly between urban and rural communities. Morris *et al* (2009) and Posthumus and Morris (2007) outline the characteristics of rural communities that potentially enhance their

vulnerability to flooding, including: a high proportion of home based small traders; the particularly high costs of summer flooding to agriculture and tourism businesses; the cost effectiveness of flood protection in sparsely populated areas; and the conflicts in land use between agriculture and water storage. Further research is needed on the effects of flooding on both agricultural and non agricultural businesses in rural areas.

Studies of the social justice implications of flooding have tended to focus upon fluvial and tidal flooding and have not addressed surface water and sewer overflows or dam failures. In urban areas the highest risk of flooding may come from drain overflows and many residents may not be aware of the risk of flooding in their locality until it happens (Wheater and Evans, 2009). There is a need for social impacts to be extended to flooding other than fluvial and tidal.

Theme two: The relative roles of public and private institutions in flood risk management

The shift from flood protection to flood risk management (FRM) has been associated with a change in emphasis, from direct government responsibility to individual responsibility supported by public and private institutions.

Penning-Roswell *et al.* (2005) argue for more diversity within FRM approaches as the flood damage potential of residential and non-residential properties has risen significantly in real terms in the past decade. Treby *et al.* (2006) argue that flood insurance should be treated as a flood management tool in that it raises awareness of flooding, promotes socio/economic resilience and spreads risk over time and space. It may be necessary to draw on individual and commercial funding where central funding cannot be justified for structural works, but such a move towards a more competitive risk-based approach has major social justice implications (Johnson *et al.*, 2007). New roles for these different actors in FRM will require significant collaboration between stakeholders including: water companies; planners; the insurance industry; local residents; and the implementing agencies, such as the Environment Agency, Internal Drainage Boards and Local Authorities (Johnson and Priest, 2008). As greater responsibility for flood resilience shifts to the individual, the particular needs of those unable to obtain or afford insurance or other flood resilience measures will need to be explored and developed. There is a requirement for further research in this area.

Theme three: The relationship between local experience and the government /national agencies

Alongside the shift in FRM responsibilities from government to the individual, there has also increasingly been a shift in responsibility for the *governance* of FRM to the Environment Agency, Internal Drainage Boards and Local Authorities, which has brought about change both within and between institutions. If such shifts are to bring about more sustainable flood management (Werritty, 2009), there is a need for genuine and effective approaches for engaging with local people in FRM decision-making processes, moving beyond traditional stakeholder consultation (Ryedale Flood Research Group 2009). Howgate and Kenyon (2009) draw on the case study of the Scottish Borders to describe engagement with local people and highlight some of the institutional forms that this might take. The very specific local conditions associated with flooding mean that local knowledge has an important role to play in building resilience and in flood warning and dissemination. As noted in Theme 2 above there is a need for much greater integration of actors in local planning policy to develop strategies suitable to specific local circumstances. Studies in other European countries point to examples of how this might be achieved and highlight significant factors that can constrain or support institutional change linking the local to the national level (see for example, Naess *et al.*, 2005; Erdlenbruch *et al.*, 2009)

Following the Pitt Review, organisational change has been implemented (such as the identification of lead agencies for control activities during flood events), yet there is a lack of studies exploring the effectiveness of local organisations or the further lessons that may be learned.

One particular area involving complex institutional arrangements is the role of land management in FRM (Posthumus and Morris, 2007). Certain types of land-use change, for example, could lower the likelihood of flood incidence by reducing the speed of flow and serving as a store of excess water. However this raises questions concerning the extent to which the multiple objectives of rural land management are compatible with FRM and the ways in which decisions are made by individual landowners within this complex policy environment. Patterns of land ownership and property rights will likely influence how people prioritise and balance different land management and FRM objectives. Erdlenbruch *et al.* (2009) examine land management and flooding in France, and raise issues and future research needs relevant to the situation in England and Wales.

Theme four: Reducing vulnerability and increasing resilience and resistance at a community and household level

A large number of drivers for enhancing flood resilience are socio-economic rather than technical (Wheater and Evans, 2009).

Vulnerable groups are not homogeneous. Fielding (2007) suggests that vulnerability may be seen by outside observers according to various socio-demographic characteristics e.g. old age; ill-health or poverty but that those experience flooding may have very different perceptions of their own vulnerability. Both views are important to understanding vulnerability and its implications for FRM.

There is a body of evidence that shows that assumptions of 'information deficit' in communities at risk of flooding does not explain people's failure to respond to flood risk. For example, despite the wide scale provision of information in a number of different forms by the Environment Agency, Parker *et al.*, (2009) reports that there are still substantial numbers of individuals not sufficiently motivated, aware or knowledgeable to act to increase the flood resilience of their homes.

People may be aware about flood risk in general terms but not how they or their property are at risk. Risk perception is often highly personal, affected by memory, personal experience, emotional state etc, and is not determined by a cognitive probability (Parker *et al.*, 2009). Many people fail to accept that they live in a flood risk area, which causes significant problems for emergency planning managers. Further problems are caused by people ignoring flood warnings. It is not clear why some people react in this way to flood warnings; they may not receive them, they may be unwilling to leave their property or unable to move their goods. Understanding the complex issues around personal risk judgements and the factors that influence behavioural responses and encourage better social adaptation and resilience are areas that could benefit from further social research.

Resilience to flooding will in part be determined by local coping strategies, such as the presence of social and family support networks. There is a need to investigate coping strategies both in the immediate time of the flood and in building resilience in the longer term, and to identify the institutional framework necessary to support the development of coping strategies.

Tapsell *et al.* (2002) warn of the short and long term health effects of floods and the implications for future vulnerability. Carroll (2009) notes the significance of long term psychological effects of flooding and how this links to the self perceptions of vulnerability. Further research is required in relation to vulnerability and

resilience building at the *household* and *local* level in relation to all forms of flooding, not just fluvial and tidal.

Cross cutting and overlap issues

A number of the cross-cutting issues emerging in this area also correspond to research gaps, at least based on the literature identified in these rapid searches. These include:

- The role of uncertainty in flood forecasting is of major concern but has not yet been addressed in the social science literature. There is a need to examine the ways in which uncertainty can be introduced into FRM that does not reduce confidence and therefore willingness to act on the part of the individual.
- There are conflicts between the use of highly productive land for flood protection and food production. A number of issues relate to how to bring about successful multifunctional land use within a complex institutional framework that operates across a number of scales from the individual farm to the local/national and EU level and a number of policy areas. Such issues can only be addressed through cross cutting research agendas (LUPG, 2009).
- Across all of the policy strategy areas noted above there is a need to incorporate local knowledge in FRM, not just as a consultancy exercise but including people as participants.

Description of remaining research gaps

A number of changes are currently underway in the management of flood risk in response to the Floods Directive, the Pitt Report and the Flood and Water Management Act. In addition to the research needs noted above, further social research could usefully examine the effectiveness and social impacts of these changes and the ways in which they are implemented; the distribution of costs and benefits across geographical areas and how these can be managed.

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5. Water Quality and Availability Policy

This summary paper is one of eight that reports on a rapid overview of the social science literature relevant to Defra’s Environment and Rural Group (ERG) policy areas. Together they form an output from Phase One of the Defra-funded project ‘*Social science evidence review to inform Natural Environmental policy*’ (Defra project NE0109). Whilst it is believed that these overview papers will be useful to the work of policy-makers across Defra’s delivery landscape, they are *not* intended to represent a fully comprehensive review of all social science literature in this policy area. The reviews were necessarily completed in three days, primarily searching the Web of Knowledge database, focusing on literature from 2000-2010, supplemented by targeted searches of key organisational websites. Search terms were developed based on relevant ERG policy objectives as identified in Government Strategy documents, produced prior to the 2010 General Election.

Water Quality and Availability Policy Objectives

This overview seeks to address the water quality and availability policy objectives identified in Defra’s most recent Departmental Report (2009) and ‘Future Water’ (2008). An assessment of the level of social science research relevant to each of these specific policy objectives is provided in Table 1.

Table 1 – Assessment of the level of social science literature for each policy objective

	Policy objective	Description of relevant social science research
Significant	Water companies to prepare and maintain plans to meet demand for water	Research into current demand management measures commonly employed in England and Wales, the importance of communications and understanding of the water consumer in informing these strategies, and water-related behaviour by consumers (Sharp, 2006, Medd and Chappells, 2007, Hurlimann, 2009).
	Improving water efficiency standards for industry, commerce and domestic.	Current domestic water consumption, the effects of consumption of products that require water in their production and transport, and resulting use of ‘virtual water’ or ‘water footprints’ of UK residents (Champagain and Orr, 2008). The influence of enforcement and information on domestic water use (Halich and Stephenson, 2009), influencing behaviour change in farmers (Blackstock et al, 2009), understanding water-related behaviour (Hurlimann, 2009) and sustainable water use (Daigger, 2009).
	Introducing effective and fair demand management strategies, e.g. metering, product labelling, encourage people to value water, rainwater use, water foot-printing.	The relevance of ‘economies of scale’ to domestic water use, and issues relating to the trend towards smaller households (Barrett, G., and Wallace, M., 2009). Factors which influence household water consumption, including lifestyles and other social factors (Jorgensen et al 2009), (Sharp, 2006), and water-related behaviours which are more difficult to influence based on social and cultural norms Medd and Chappells (2007). The effects of ‘scarcity-pricing’ and the sectors of community more likely to adopt rainwater or grey water systems (Ryan et al, 2009). Influence of family and friends on attitudes to alternative water sources (Dolnical and Hurlimann, 2009), influence of description of treated water on acceptance by farmers and consumers (Menagaki et al, 2008)
Some	Helping farmers adapt to the needs of water quality, water availability.	The need to engage farmers to ensure water quality improvements, and the potential need to change beliefs in order to change behaviours (Blackstock et al, 2009), Burton et al (2008). Issues relating to some farmers not wanting to change behaviour unless it is likely to benefit them (Posthumus et al, 2008).

	Policy objective	Description of relevant social science research
	Maintaining high quality waterbodies for recreational, amenity, biodiversity.	Much of the relevant research relates to the Water Framework Directive, including surveys of individuals' willingness to pay for improvements in water quality (Del Sal-Salazar et al, 2009), and mitigation methods for diffuse pollution (MacLeod et al 2008).
Limited	Considerations related to the impact of abstraction, and potential for accelerating reservoir development	None identified
N/A*	Ensuring efficiency of supply, particularly in areas vulnerable to future drought.	N/A
	Maintaining appropriate limits on the concentrations of potentially harmful chemicals in drinking water	N/A

* Not primarily answerable by social science

Key:
Significant social science literature
Some social science literature
No or limited social science literature

An overview of the social science research

The pressures imposed by climatic and socio-demographic changes are creating new and largely unpredictable challenges for the UK water sector (Medd and Chappells, 2007), such that addressing water demand now presents one of the most significant long-term challenges for environmental policy-makers.

The key themes which emerge from a scoping review of relevant social research include:

- **Theme One:** Meeting water demand
- **Theme Two:** Understanding water demand and water use behaviours
- **Theme Three:** Supporting farmers in reducing their impact on water quality
- **Theme Four:** Maintaining water quality in our lakes, rivers and waterbodies

Theme one: Meeting water demand

By 2001, over 40% of abstracted water was being used to meet domestic demand (Sharp, 2006). UK water management is currently framed by a 'twin-track' approach, incorporating a balance of supply and demand strategies largely focused on the individual water user. Sociological research has begun to challenge this, suggesting that strategies based on understanding the wider social, institutional and infrastructural dynamics shaping user demand would be more effective.

Current demand management strategies tend to make flawed assumptions about how the domestic consumer (or 'water-user') will perceive and respond to new demand management strategies (Sharp, 2006). A policy approach that increases the price of water, for example, assumes that the water user is a purchaser of water and that he or she will react to the price increase through reduced use. Yet, in reality, different water users will react to this policy message in a variety of ways.

A small body of literature was identified exploring public responses to water metering and changes in charging regimes. Chappells and Medd (2008) highlight public concerns about the implications of water meters and variable charging systems for the provision of fair and affordable water for low income households. They argue that a better understanding of demand situated within social and geographical context could usefully inform existing debates about cross-subsidisation approaches to water charging. The '*Public Understanding of Sustainable Water Use in the Home*' report for Defra (Owens *et al.*, 2009) highlights limited public awareness of water scarcity and suggests that, whilst metering can increase water efficient behaviour to some extent, the cost of water is not high enough in relation to other utilities to merit stringent water economies (though use of hot water was to some degree influenced by energy costs). Most unmetered participants responded negatively to the idea of installing a meter, particularly those with families, large households or large gardens. Some participants suggested ways of being able to maintain current levels of water use despite installation of a meter, such as using an unmetered neighbour's hose to wash the car or using a car wash instead. Many of these issues were picked up in the *Independent Review of Charging for Household Water and Sewerage Services* (Walker, 2009).

This highlights the importance of developing an in-depth understanding of the various factors that drive consumer demand for water before introducing demand management measures. Also of value would be to explore the potential for innovation in demand management strategies targeted at ensuring such measures address the various drivers of demand.

Medd and Chappells (2007) suggest that the UK water service industry prioritises 'security of supply', rather than the potential to manage demand for water, and that this limits the demand management options available to water managers. For example, while many consumers saw the benefits of water recycling and did not see a need to use pristine drinking water for every purpose, water managers did not consider this as an option.

A recent paper by Hurlimann *et al.* (2009) summarises existing research into methods to address water scarcity, and public willingness to adopt water conserving behaviours.

Theme two: Understanding water demand and water use behaviours

Approaches for improving water efficiency standards should be informed by an accurate understanding of the amount of water used for industry, commerce and at a domestic level, and of the way in which it is used. While average household water use in the UK is around 150 litres per person per day, our consumption of products from other countries means that UK resident's 'Water Footprint' is actually approximately 4,645 litres of water every day, which is equivalent to 50 full bath tubs of water (Chapagain and Orr, 2008). Most of this is in the form of 'virtual water'; that is the volume of water required to produce a product. A can of cola, for example, contains 0.35 litres of water, yet an average of 200 litres of water is required to grow and process the sugar contained in that can, whilst a the water footprint of a cup of coffee is 140 litres and of a cup of tea is 34 litres (Chapagain and Hoekstra, 2007). Water Footprints might therefore be a better way of expressing water demand as it includes this concept of virtual water⁶. Awareness of the amount of virtual water required to produce industrial and commercial products and enable lifestyles, could contribute to

⁶ It is, however, important to note that the meaning of the virtual water content depends on whether water is a plentiful or constrained resource at the time and place in which the product is produced.

improving people's overall water demand, in a similar way to the carbon foot-printing approach which is now in widespread use.

Research exists on ways to address predicted demand for water, and introducing effective and fair demand management strategies. Jorgensen *et al.* (2009) considers factors which influence household water consumption, and suggest that *trust*, both interpersonal (i.e. trusting that your neighbours and other residents are reducing water) and institutional (trust in the ethics of the water authority), has a notable role in household water consumption.

Research from Australia indicates that economies of scale exist with water use within the home as larger households tend to use less water per person. This is a concern in light of the trend (both in Australia and the UK) towards smaller household sizes (Barrett and Wallace, 2009). This trend is further supported by a recent study in Germany, which found a negative correlation between household size and water use, and identified some evidence that rainfall patterns affect water use, but the climatic temperature does not (Schleich and Hillenbrand, 2009).

In order to introduce effective demand management strategies, it is important to understand the social factors which contribute to individuals' water use patterns. Spaargaren's 'social practices model' suggests that individual consumer demand and preferences arise from a combination of their *lifestyle preferences* and the *systems of provision* available to them. Lifestyle preferences are recognised as affected by social norms and practical time-space possibilities available to the individual, whilst the systems of provision are constrained by rules about provision and the 'path dependency' created by existing infrastructure (Sharp, 2006).

Research undertaken by Medd and Chappells (2007) following the severe droughts experienced in south east England in the summer of 2006 illustrates how water demand can be influenced by the interrelation of these lifestyle and service provision factors. They found that the droughts did not impact on activities such as flushing the toilet or showering, in part because they are habitual and part of the daily routine, and in part because such activities are strongly framed by social norms. These activities are considered necessary to achieve what is 'right' and 'proper' in terms of hygiene, cleanliness and social requirements, and therefore are not regarded as appropriate areas for economy. Medd and Chappells (2007) also found that water demand for outdoor living in a domestic context was more directly affected by the drought, and explored the social determinants of these responses to drought.

Little research from the UK was found through the literature review, although several insightful studies have been undertaken in Australia, which is experiencing more significant water shortages than the UK or Europe. Social research on mechanisms to decrease demand in water catchments has been undertaken in Australia, where there are severe water shortage issues. One study explores the potential to decrease water demand substantially through the introduction of domestic grey water/rainwater systems. The study showed that age, gender, income and education could not conclusively differentiate those who used such systems from those who did not, although females and individuals on low incomes were more likely to do so (Ryan *et al.*, 2009).

Dolnical and Hurlimann (2009) note the importance of understanding community attitudes to alternative sources of water, including rainwater, and studied the influence of attitudes, social norms and behavioural control. The study revealed that friends and relatives are very influential in persuading individuals from drinking recycled water, but that most of those questioned stated they would be willing to drink water from alternative sources if the water crisis deteriorated further.

Research indicates that although communities support the concept of water reuse in order to reduce the pressure on water catchments, they are often concerned or distressed about actually using recycled water, particularly when close contact or ingestion are involved (Nancarrow et al, 2008). Concerns about water reuse were found to be influenced by its description, with the term 'recycled water' eliciting more positive responses than the term 'treated waster water' despite both terms describing the same water product. The descriptive term used was only found to influence the perception of consumers, and made little difference to the sample of farmers, which demonstrated similar willingness to pay for the water product regardless of the descriptive term employed (Menagaki et al, 2009).

Medd and Chappells (2007) highlight that different orientations to outdoor life influence consumer responses to the reuse of rainwater; households with a more *productive* orientation to outdoor life had installed rainwater butts as a long-standing feature and many considered rainwater to be better for plants than chemically treated tap water. In contrast, households which prioritised *convenience* based their decision on whether to use the technology in terms of whether this was likely to save them time or effort, and the level of support available for the installation of such devices. Families with children often saw rainwater collection technologies as a low priority and sometimes cited concerns about safety and the idea of water sitting around.

Theme three: Supporting farmers in reducing their impact on water quality

Recent research by *Blackstock et al.* (2009) explores how to influence farmer's behaviour to reduce agricultural pollution of waterbodies. The study highlights the importance of engaging farmers when trying to manage diffuse pollution of the water environment. It explores the theoretical basis of changing individual behaviour, referring to literature from social psychology which focuses on approaches of persuasion. Persuasion theories illustrate how behaviour can sometimes be altered by changing the beliefs that underlie attitudes. Morton and Weng (2009) suggest that personal and civic connections among farmers and communities are important in explaining farmer perceptions of the adequacy of their efforts to protect local water bodies. In particular, it was found that the more farmers talk with other farmers the more likely they are satisfied with their conservation efforts. However, the more frequently they talk to friends and neighbours that do not farm, and the more social organisations they belong to (i.e. the more non-farmers they interact with in a group setting), the less satisfied they are likely to be.

Research by Burton *et al.* (2008) highlights that cultural factors influence perceptions of what comprises a 'good' farmer, with resulting impacts on agricultural management approaches. In Western Europe, traditional perceptions of 'good farming' require efficient production and high yields, and farmers are likely to reject schemes that undermine the visible symbols of good farming, such as overgrown buffer strips. Case studies illustrate that farmers are reluctant to engage in sustainable water management when they do not feel they will benefit from such actions (Posthumus *et al.*, 2008). The will to participate depends on whether the perceived benefits of collective action outweigh the perceived costs. Research conducted in the Netherlands indicates that monitoring is essential in communicating the environmental changes as a result of farmers' behavioural change is important in maintaining farmers' motivation to continue less polluting farming practices (Sloots et al, 2004).

Incentives for farmers to address water pollution have been researched through several studies, including work by Defra in the UK, through the Catchment Sensitive Farming Delivery Initiative (2008). This study concluded that the majority of farmers were responsive to the Initiative, and that participating farmers' understanding of diffuse water pollution issues increased significantly over the year-long study. Work by

Collins and Maille (2008) in the United States found that farmers need some indication of payments, not just prices, in order to commit to the scheme. Some useful field research is also available as a result of the Voluntary Initiative, a UK initiative to reduce pesticide levels in six pilot catchments through engaging farmers and land managers. In terms of effectiveness, the Initiative had mixed results, including a 98% reduction in pollutants in one catchment, but has revealed challenges related to specific herbicides and intense rainfall events. The study found that active involvement of advisers, manufacturers and affected groups, such as the water utilities, in producing best practice advice both ensures the measures are practical but increases the willingness of the farmer and their advisers, to use the tools. It found that having effective, locally developed, and regularly reviewed advice is a start, but it is wasted without effective communication. It also notes that voluntary measures need support from all sectors in order to succeed, and that some of the methods require significant resource and expertise (Humphrey *et al.*, 2007).

Theme four: Maintaining water quality in our lakes, rivers and waterbodies

The EC Water Framework Directive, which aims to achieve ‘good ecological status’ in all water bodies by 2015, is considered in a number of social research papers. These include surveys on individuals’ willingness to pay for improvements in water quality. Del Sal-Salazar *et al.* (2009) for example, estimated the value of a hypothetical improvement in water quality of a river and asked individuals about their willingness to pay for the improvements, and also their willingness to accept compensation if projected improvements were not carried out. They suggest that people’s willingness to pay for improvements to river water quality suggest that it is desirable from a social perspective. Research by MacLeod *et al.* (2008) refers to the Diffuse Pollution User Manual, which addresses mitigation methods for diffuse pollution.

Research has been conducted into the numbers of people who use lakes, rivers and waterbodies for recreation (Church *et al.*, 2001), but social research exploring public views and perspectives on the water quality of these was not identified in this rapid review.

A limited amount of research was identified on public perceptions of sustainable urban drainage systems (SUDS)⁷. The Scottish SUDS Monitoring Group, for example, undertook a series of social perception surveys in areas with SUDS ponds and found that aesthetics and the amenity value of SUDs ponds play an important role in formulating public attitudes; the introduction of native vegetation for the area is recommended and attraction of wildlife and related educational boards seen as beneficial. Also suggested was the introduction of benches and picnic tables overlooking ponds, and the creation of children’s playgrounds and walkways close to ponds. Maintenance was a major public concern, with litter, pollution and silt accumulation perceived to be the main problems (Jefferies, 2004).

Cross cutting and overlap issues

There is some overlap between Theme four ‘Maintaining water quality in our lakes, rivers and waterbodies’, and the Wildlife and Biodiversity and Land Management and Soil policy areas. Within this policy area, there is some overlap between themes, such as themes one and two, and themes three and four.

Description of remaining research gaps

The major gaps in existing research which relate to the key policy objectives are as follows:

⁷ Defined as ‘storm or water drainage facilities designed to address three essential issues – water quality, water quantity and amenity (including biodiversity)’ (Jefferies, 2004: iv).

- The social impact of increased water abstraction, and public acceptability of proposals to accelerate reservoir development.
- Public understanding of water supply as an environmental stress, and the implications of this for demand-related water behaviours and public acceptability of measures proposed to ration or limit water use.
- Helping farmers reduce their water demands
- Social considerations in maintaining high quality water bodies

It is important to note that much of the research into water demand management comes from outside the UK, particularly Australia, and that there is a need for more UK-based research on this issue.

More specific gaps in research are identified through some of the studies listed above. Hurlimann *et al.* (2009) identifies knowledge gaps in relation to the adoption of demand-related water behaviours, and research into demand-related solutions. Similarly, Blackstock *et al.* (2009) highlight that further research is needed to identify effective approaches for encouraging farmers to adopt less polluting agricultural practices. In addition, there appears to have been little social research exploring public understanding or awareness of virtual water and 'water footprints' or potential interventions that would encourage consumers to reduce their consumption of water intensive commodities.

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6. People and Landscapes Policy

This summary paper is one of eight that reports on a rapid overview of the social science literature relevant to Defra’s Environment and Rural Group (ERG) policy areas. Together they form an output from Phase One of the Defra-funded project ‘*Social science evidence review to inform Natural Environmental policy*’ (Defra project NE0109). Whilst it is believed that these overview papers will be useful to the work of policy-makers across Defra’s delivery landscape, they are not intended to represent a fully comprehensive review of all social science literature in this policy area. The reviews were necessarily completed in three days, primarily searching the Web of Knowledge database, focusing on literature from 2000-2010, supplemented by targeted searches of key organisational websites. Search terms were developed based on relevant ERG policy objectives as identified in Government Strategy documents, produced prior to the 2010 General Election.

People and Landscapes Policy Objectives

This overview seeks to address the people and landscapes policy objectives identified from Natural England and Defra’s ‘key priorities’, the Diversity Review and the 2009 ‘*Outdoors for All?*’ Action Plan. These policy objectives are set in the context of the European Landscape Convention (ELC) which came into effect in the UK in March 2007. The ELC highlights the need to develop policies dedicated to the protection, management and planning of landscape. The ELC defines landscape as ‘an area, as perceived by people, whose character is the result of the action and interaction of natural and/or human factors’ (Council of Europe, 2000). This demonstrates how complex the term ‘landscape’ is. While several of the policy objectives provided use the term ‘countryside’ (which is itself a value laden term), this study used a range of search terms under the landscape umbrella (including ‘countryside’) to try to get a broad idea of the scope of social research. However, as this is a rapid search, it is possible that some landscape ‘types’ may not be fully represented (such as those relating to urban landscapes), particularly as the search focussed on the policy objectives provided, and content has been influenced by the findings of other relevant review papers. An assessment of the level of social science research relevant to each of these specific policy objectives is provided in Table 1 below.

Table 1– Assessment of the level of social science literature for each policy objective

	Policy objective	Description of relevant social science research
Significant	Understanding why people value landscapes and how this influences their use of, attitudes to, and behaviour within the countryside	The majority of the social research identified through this search related to how people value landscapes and components of landscapes, how to measure these values and perceptions and how this can inform the management of the landscape. This included how different land management practices (in particular agricultural practices) can affect people’s perceptions of landscapes and what constitutes a ‘landscape which they appreciate and want to spend time in’.
Some	Understanding the drivers of degradation of landscapes and the implications of this for future enjoyment and use of these areas	Research findings would suggest that the two forms of degradation people recognise or consider to be degradation are urbanisation and changing land use practices (particularly in relation to agricultural and woodland landscapes).
	Ensuring people from a wider range of backgrounds are able to access and enjoy the countryside.	Social research is identified in relation to why different social or cultural groups face real or perceived barriers to certain landscapes, particularly ‘open countryside’/rural landscapes, woodlands, and greenspaces (mainly urban).

Limited	Understanding the implications of climate change on landscape and how it is used.	There was relatively little social research identified which related specifically to perceptions of the impacts of climate change on landscape. There is literature on the perceptions of change outside the UK, but not specifically in relation to climate change, and little within the UK specifically. The exception is in relation to wind turbines –less research was identified in relation to other energy generation related structures.
Limited	Considering how to incentivise land managers (farmers, woodlands, etc) to maintain the countryside.	This is an overarching objective between the Land Management, Ecosystems Approach, People & Landscapes, Biodiversity and Rural policy areas. Some social research exists on the impacts of agri-environment schemes such as the Entry Level Stewardship and Countryside Stewardship Schemes. Most of the research relates to agricultural land managers. There are a few UK examples for other specific landscape types (e.g. woodland), with the majority of examples coming from outside the UK.

Key:
Significant social science literature
Some social science literature
No or limited social science literature

An overview of the social science research

The key themes which emerge include:

- **Theme one:** Use of Landscapes – access and recreation
- **Theme two:** The perceived benefits of landscape
- **Theme three:** Landscape perceptions and preferences
- **Theme four:** Judging condition and change in the landscape
- **Theme five:** The role of land managers

In a recent paper on society’s attitudes to and preferences for land and landscape, undertaken for the land use futures element of the ‘Foresight’ project, Swanwick (2009) notes that much of the academic literature on people and landscapes is from the United States and other countries outside the UK, and that there is increasing evidence that perceptions of landscapes are place-specific. Therefore, some non-UK examples have been included in the paper, but the focus is on UK examples.

Theme one: Use of landscapes (for access and recreation)

Swanwick (2009) acknowledges that gardens and greenspaces represent people’s main interaction with the land. Levels of recreational interaction with the landscape in the UK, including people’s access to, and use of greenspace, gardens and allotments have been examined through a number of studies (e.g. Dunnett *et al.*, 2002, Gross and Lane, 2007, and the Urban Parks Forum, 2001). Swanwick (2009) also highlights the lack of research on the much-reported increase in domestic tourism and leisure activity as a result of the economic crisis of 2008/2009.

Countryside access has been a focus of policy and legislation since the National Parks and Access to the Countryside Act 1949, and was later reaffirmed through the Countryside Act 1968 and the Countryside and Rights of Way (cROW) Act (2000). This has provided a distinct policy pull for social research undertaken in relation to the use of landscapes for access and recreation. Social research in this field has explored ways to improve access to the landscape through exploring the barriers to access for different groups, including the influence of cultural and religious differences. Ambrose (2009) usefully separates these barriers into three different types; *perceived barriers* (which stop people accessing the landscape, e.g. perceived lack of time or

fear of crime); *social and emotional barriers* (relating to the ways in which people connect with the landscape at a more personal preference level, e.g. levels of confidence in outdoor settings); and *physical and structural barriers* (site-based and wider societal or economic issues which act as barriers, e.g. for disabled users or people on lower incomes). The author defines these types in relation to trees, woodlands and forests, but the typologies reflect other social research studies on the topic and can be applied to other landscape types. Social research into these barriers identified differences between different ethnic groups. Bujis (2009: 113) for example, suggested that despite the growing cultural diversity in many European countries, nature recreation 'is still a very "white" activity', and that in terms of nature conservation policy, the primacy given to promoting 'wild' and unmanaged landscapes in Europe does not seem to concur with the preferences of immigrant groups for more managed landscapes (as identified in Upham *et al.*, 2009). Brown (2008) considered barriers to participation in outdoor activities in Northern Ireland specifically.

Natural England [then the Countryside Agency] commissioned research as part of the 'Diversity Review'; including a study to provide information about the availability of existing baseline data on countryside visiting by people from minority ethnic and black communities, disabled people, young people, and some of their reasons for participation and non-participation (Ward-Thompson *et al.*, 2003). Apart from identifying a lack of baseline information regarding the level and nature of participation in countryside activities by under-represented groups (which may partly have been met by later research identified in this review), the study notes that a comprehensive and integrated approach is required to increase the frequency of visits made by under-represented groups, including enhancing people's understanding and sense of belonging in the countryside. These findings have been explored further through a number of case studies in the English and Welsh National Parks.

Research into these barriers, and how they affect visitor numbers at certain destinations, has been used to explore how managers can increase visitor numbers at these destinations whilst using sustainable management practices (e.g. Ambrose, 2009; Brown, 2008; Harshaw & Shepherd, 2007; NFO, 2006; and O'Brien, 2004), as well as other factors, such as the willingness to pay for access to certain areas (e.g. Buckley *et al.*, 2009; Gret-Regany *et al.*, 2007; and Sayadi *et al.*, 2009). Social research identified in this review uses a number of tools to improve public engagement in the future planning of certain sites. Several UK-specific social research studies have focussed on particular designated landscapes, such as Areas of Outstanding Natural Beauty (e.g. Fuller, 2005) and woodlands/forests (e.g. Ambrose-Oji, 2009; Forestry Commission, 2007; and Millward and Royal, 2008).

Other research has focussed on the ownership of landscape and the rights of access, with several examples specific to agricultural landscapes (e.g. Hodjring, 2002; and Hopf, 2000). These are studies undertaken outside the UK but are relevant to the debate in the UK about potential barriers to access.

Theme two: The perceived benefits of landscape

Social research on the services provided by the landscape is also of relevance to the policy briefing on the Ecosystems Approach. The economic value of landscapes has not been considered in this review.

Social research undertaken in this area confirms the importance of landscape to people and the wide range of services and benefits that it provides (Research Box *et al.*, 2009) There is significant literature on the benefits of 'nature' (physical access to it as well as awareness of it) for health and wellbeing, including evidence that natural environments reduce stress, restore attention/concentration, and aid recovery from surgery (e.g. Bird, 2007, Croucher *et al.*, 2007, Pretty *et al.* 2003, Pretty, 2007, and RSPB, 2004) and several studies cited in Upham *et al.* (2009: 50). In terms of landscapes specifically, Natural England recently

published research into the cultural services and experiential qualities of landscapes, which gathered information on people's perceptions of different landscape features, as well as 'whole' landscapes (Research Box *et al.*, 2009). This qualitative study recognised that landscapes provide a number of 'services' to people, including spiritual enrichment, cognitive development, reflection, recreation, and aesthetic enjoyment, and explored in detail whether such services correlate to particular landscape characteristics or features. Of particular relevance here are the findings that cultural services and benefits are often seen as being delivered by the landscape as an entity, and that all landscapes deliver all the cultural services identified to a greater or lesser extent. Furthermore, the study found that landscape features will deliver the same range of services regardless of where they are in the UK, though the setting of individual features may affect how they are perceived and the level of service delivery (Research Box *et al.*, 2009).

The benefits of 'natural' landscapes in urban areas in the form of parks and greenspace has been the focus of several studies, where research has considered the benefits of urban greenspace for both physical and mental health (e.g. Hickman, 2009; and Pretty *et al.*, 2003) and builds on a heritage of promoting 'Nature in the City' started in the 1970s. One critical review of the benefits of greenspace (OPENSspace, 2008) concludes that individuals who have some nearby vegetation or live closer to greenspace seem to be more effective in managing major life issues, are better able to cope with poverty, and display higher performance in cognitive tasks. Swanwick (2009) also notes that the review finds some evidence that greenspaces (such as parks and gardens) promote social cohesion within and between different groups. An increasing interest in green infrastructure, the importance of greenspace and its role in the development of sustainable communities has been recognised in Natural England's 2008 policy statement on housing and green infrastructure, amongst other policies and initiatives across Government.

Research on the importance of landscape to people has also been undertaken to inform specific landscape assessment and appraisal tools, such as providing assistance in the updating of landscape character areas (Research Box *et al.*, 2009). The research also contributes to the evidence base for understanding ecosystems services, and in turn the ecosystems approach to policy and decision-making. It should also inform policies on land management and planning more generally.

Theme three: Perceptions of the landscape – preferences

Swanwick (2009) suggests that it is impossible to consider society's attitudes to land and landscapes as whole, as different communities within society will have different attitudes (p.566). The paper also highlights the long running debate about whether there should be emphasis on the views and perceptions of experts and professional groups in the population, or those of the general public (p.566). Some elements of both are reflected in this overview, but it is recognised that perceptions of the general public are most likely to be of interest to the ERG policy teams.

Information about what people like about rural landscapes and greenspaces in towns and cities can be drawn from large-scale public attitude surveys, from smaller scale, qualitative surveys of attitudes, perceptions, and from a wide range of academic research, which may be divided into the following three categories; formal aesthetic studies (the aesthetics of landscape, how the eye perceives them and the principles of design); behavioural studies (which deal with perception of the physical environment, cognition, psychophysical responses and the basis of preferences); and humanistic studies (including the whole experience of, and emotional responses to, being in and interacting with the landscape) (Swanwick , 2009). The latter may include the potential for content analysis of bodies of interpretive art and writing in which people express what matters to them and why.

In a comprehensive study of 'Public attitudes to environmental change', Upham *et al.* (2009) identified the significant amount of environmental psychology literature pertaining to environmental preferences, aesthetics and the restorative effects of landscapes, some of which has been discussed above. The study notes that in general, research has indicated that natural/wilderness environments are preferred over urban/artificial ones. The literature also indicates certain features of environments and landscapes which tend to be preferred; these include: water, vegetation, relief, ruggedness, refuge, (half) open views, as well as environments of moderate complexity, novelty, incongruity and surprisingness (Upham *et al.*, 2009). Ozgunur & Kendle (2006: 139) considered public attitudes towards natural versus designed landscapes in the city of Sheffield, concluding that the public derive benefits from both types of landscape, and prefer both types of natural environment but for different reasons. Another study, undertaken by Bell *et al.*, for English Nature (2004) looked at the importance of greenspaces for communities in the East Midlands. Along with several findings related to usage of greenspace, the study identified a number of preferences. The most positive perceptions were of greenspaces 'closer to home', spaces which were managed but not 'overly' managed, and 'nature reserves, woodlands and urban parks'. Swanwick (2009) notes that in general there is less evidence on attitudes to green and open space around towns and cities (also known as peri-urban landscapes) compared with urban greenspace studies, and that in general, the majority of research focuses on rural landscapes. Swanwick also notes that there is relatively little academic evidence on the influence of socioeconomic status on landscape preferences.

The 2009 Research Box study for Natural England noted that people tend to recognise a landscape as the sum of its component parts (i.e. the different characteristics combine to form the landscapes they know), rather than picking out preferences for individual features. However, the study also found that when presented with a pre-agreed list of individual landscape features (e.g. hedgerows, water, mountains), people related to and expressed preferences for specific features, which was often linked to their 'experiential' qualities (i.e. the way they make people feel). Preferences for different types of landscape and landscape features have also been explored in the literature with a focus on individual features or landscape types. Swanwick (2007) identifies examples of the most useful UK studies in relation to public preferences for, and attitudes towards, landscape (as of 2007), which include the public perception component of the New Map of England project (New Map Consortium, 1993); work in the North Pennines on Environmental Capital (Land Use Consultants and the University of Sheffield, 1998); and work in Wales related to LANDMAP (Scott, 2003). All of these studies explored people's responses to different landscape types or areas, in terms of their elements or features and their aesthetic and perceptual aspects, as well as overall responses and reactions to change (Upham *et al.*, 2009: 51). A number of studies have considered the impact of agricultural landscapes on public preference (e.g. Bujis *et al.*, 2006; De Groot, 2003; Sayadi, 2009; and Swanwick, 2007), including specific practices such as organic farming (Kuiper, 2000). Studies into specific engineering or infrastructural features on landscape preference were also identified, including the impact of roads on the landscape (e.g. Brush *et al.*, 2000; and Garre, 2009), and the reasons for local opposition to wind power developments, including the influence of visual perception (e.g. Gee, 2010; and Johanssen, 2007). Upham *et al.* (2009: 8) emphasises the potential role of place attachment and place identity literature in helping to shed light on people's responses to new energy infrastructure, and noted that there is 'sizable' literature that seeks to understand public opposition to energy infrastructure. It should be noted that wind power developments were the only form of energy infrastructure for which social research on attitudes and reasons for objection had been identified through this search.

Theme four: Judging condition and change in the landscape

The future evolution of our agricultural landscapes and countryside is the subject of considerable debate and policy discussion (Dokerty *et al.*, 2005). This debate must be considered in the context of two other key areas of policy emphasis; the impacts of climate change on our landscapes and countryside, and the increasing emphasis on public participation and community engagement in planning and decision-making processes.

In this context, research identified through this study has focussed on tools and methodologies for accurately presenting and interpreting potential future changes in the landscape (e.g. from climate change or climate change mitigation practices) to people and communities, and to allow for better public participation which could help to inform landscape management practices in the future.

Tools and techniques have included those for visualising scenarios, for example using Geographical Information Systems (e.g. Gret-Regamey *et al.*, 2007; and Joyce, 2009), or photographic tools (e.g. Tress and Tress, 2003; and Tveit, 2009), as well as other methods such as 'community mapping' (Fahy and Cinneide, 2009). Agyeman *et al.* (2009) also considered the psychological, symbolic and emotional aspects of managed retreat in coastal locations (as noted in Upham *et al.*, 2009: 47).

Some research makes reference to the challenges of communicating the issue of climate change more generally. It is noted that with the exception of a few examples (e.g. Mayatt *et al.*, 2003 and 2003a; McEvoy *et al.*, 2008; Land Use Consultants, 2009; and Natural England, 2009 a, b, and c), the majority of the studies identified were undertaken outside the UK. However, the models and techniques could be applied to UK scenarios provided the place-specific nature of landscape perceptions is taken into consideration.

One of the key issues highlighted in the literature is the pressure to maintain landscapes as they are at present. Grant and Edwards (2006) noted that people idealise current landscapes, which exerts a pressure to maintain the status quo as far as appearance is concerned, which will be hard to achieve in practice. The authors note that management practices will be 'greatly constrained' as a result 'unless conflicts about values and uses are resolved' (2006: 551). Antrop (2005) considered how this historical perspective could inform management practices.

Upham *et al.* (2009) noted that the number of UK studies on attitudes to ecosystem and landscape change is surprisingly low. It notes that most studies undertaken are regionally-specific or small scale, and there are 'so few studies that there is little opportunity for building on experience' (2009: 46). This highlights a need to increase the national evidence base in this respect. In terms of future attitudes to land and landscape, Swanwick (2009) notes that evidence-based predictions of what society's attitudes to land and landscape may be in the future do not exist, and that the best way to contemplate possible changes is to consider what demographic, social and cultural factors appear to shape attitudes today, and then speculate about how those factors and attitudes that result may develop in the coming years (p. 570). Swanwick's paper notes that evidence on this subject relates to the following key factors: demographic, social and cultural factors; relationship to the land; familiarity, upbringing and residence; and education and environmental value orientations. It is noted that the interrelationship between these factors has not been comprehensively investigated.

Theme five: The role of land managers

One of the policy objectives concerned the potential to incentivise land managers to maintain the countryside. This is a cross cutting topic which has also been touched on in both the land management and ecosystems approach overviews. There are research papers which include social research in the appraisal of

environmental stewardship and agri-environment schemes, such as the Countryside Stewardship Scheme and the Entry Level Stewardship scheme (e.g. Dobbs & Pretty, 2008; and Hodge & Reader, 2010). A very limited number of examples concerning incentivising other types of land managers were also identified. Morris (2010) for example, examined the environmental knowledge of small rural land holders involved in the Landscape Heritage Scheme in South Devon and the implications of this for environmental policy. The paper suggests that small scale land holders should be of interest to environmental policy; being relatively knowledgeable about the environment and highly responsive to environmental advice and financial incentives that support environmental management. The paper makes a case for developing further research in this area. In relation to landscape access and recreation, Church *et. al.* (2008) examined the responses of private and public/non-profit woodland owners to financial incentive schemes related to recreational access in South East England. The findings indicate that finance is the most important incentive for achieving uptake in these schemes to promote access. However, they also suggested that other factors, such as the extent to which land managers felt they were custodians of their land and their predisposition towards the goals of the recreation access incentive scheme were important. These examples relate to specific landscapes and contexts, suggesting further research into the effectiveness of incentivising managers of other types of landscape would be beneficial in order to identify broadly applicable conclusions.

Cross cutting and overlap issues

The primary cross-cutting and overlap issues identified in this overview include those relating to: the contribution of landscape and 'nature' to Quality of Life; sustainable tourism in the context of climate change; access to nature; the role of land managers in environmental stewardship; and, tools and techniques for increasing levels of public participation in decision making, and improving the accuracy of this participation.

Description of remaining research gaps

- Attitudes to the UK natural environment have more often been investigated in relation to the impact of new infrastructure than in relation to prospective 'natural' change, such as climate change (Upham *et al.*, 2009). Upham *et al.*, (2009) in a recent comprehensive study of public attitudes to environmental change, also noted that the number of UK studies on attitudes to ecosystem and landscape change is surprisingly low – most studies appear to be regionally-specific or small scale and 'there are so few studies that there is little opportunity for building on experience'.
- There has been little social research into how 'landscape condition' is perceived by people and what these perceptions say about how land should be managed in the future.
- Research Box *et al.* (2009) introduced the Portfolio Pyramid that identified the different uses that people make of different types of landscape; social research could usefully be undertaken into the extent to which landscapes close to where people live can substitute for more 'special' landscapes further away.
- Specific research gaps were identified in relation to peri-urban or urban fringe landscapes, perceptions of future land and landscapes, and the benefits of incentivising land managers of a range of landscape types.
- Perception studies relating to marine and river environments are low (though one study was identified in the marine web-searches on public perceptions of the undersea landscape; Rose *et al.*,

2008). This is important especially in the light of the Marine Bill and the recent announcement on the latest results from the Crown Estate Windfarm Project.

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7. Rural Affairs Policy

This summary paper is one of eight that reports on a rapid overview of the social science literature relevant to Defra’s Environment and Rural Group (ERG) policy areas. Together they form an output from Phase One of the Defra-funded project ‘*Social science evidence review to inform Natural Environmental policy*’ (Defra project NE0109). Whilst it is believed that these overview papers will be useful to the work of policy-makers across Defra’s delivery landscape, they are not intended to represent a fully comprehensive review of all social science literature in this policy area. The reviews were necessarily completed in three days, primarily searching the Web of Knowledge database, focusing on literature from 2000-2010, supplemented by targeted searches of key organisational websites. Search terms were developed based on relevant ERG policy objectives as identified in Government Strategy documents, produced prior to the 2010 General Election.

Rural Affairs Policy objectives

This overview seeks to address the rural affairs policy objectives outlined in the Rural White Paper (2000) and Defra's Departmental Objective DSO 8. An assessment of the level of social science research relevant to each of these specific policy objectives is provided in Table 3 above:

Table 5 – Assessment of the level of social science literature for each policy objective

	Policy objective	Description of relevant social science research
Significant	<i>Priorities:</i> Economic and social regeneration; Social justice for all; Enhancing the value of our countryside;	Significant research attention, particularly since the formation of Commission for Rural Communities (CRC). However there remains scope for further research on the integration of these three components and better understanding the linkages between environmental, social and economic capital.
Some	The evidenced needs of rural people and communities are addressed through mainstream public policy and delivery	Some research examining the policy mechanisms required to support sustainable rural regeneration
	Economic growth is supported in rural areas with the lowest level of performance	Some research examining the causes and incidence of rural disadvantage but further scope for better identifying and targeting disadvantage
	Understanding the role of rural communities in responding to climate change	Limited research beyond the adaptive measures possible within agriculture.

Key:
Significant social science literature
Some social science literature
No or limited social science literature

Given the broad nature of the policy objectives and their ongoing relevance it is proposed that social science research can continue to inform policy across the spectrum of objectives. The priority objectives have received significant attention in the literature and particularly since the formation of the Commission for Rural Communities (CRC) in 2005. However, less research looks at the integration of economic, social and environmental objectives and there is scope for much further research along these lines to contribute to knowledge on sustainable rural development.

An overview of the social science research

The objectives within this policy area include a strong social dimension and, therefore, have been well-addressed by social science research. A growing body of research has been undertaken by independent research organisations such as the Commission for Rural Communities (England) and the Wales Rural Observatory. Such research exists alongside academic social science research in disciplines such as rural economics, sociology, cultural geography, planning and political science.

The key themes to emerge from this overview include:

- **Theme One:** Identifying and targeting rural disadvantage and potential to incorporate the natural environment
- **Theme two:** Integrating economic, social and environmental assets to realise the potential of rural areas: the case for a rural eco-economy
- **Theme three:** Social capital and climate change adaptation

Theme one: Identifying and targeting rural disadvantage and potential to incorporate the natural environment

Shucksmith (2003) shows how the means of measuring rural disadvantage serve to conceal its actual extent and nature. Much research has highlighted the "hidden" nature of rural disadvantage and social exclusion as a key policy challenge. Both the dispersed nature of rural settlement and a range of cultural factors have been long-recognised as serving to conceal rural disadvantage. Hodge and Monk (2004) refer to the generalisations that have been applied to conditions in rural areas as 'stylised fallacies' (e.g. low agricultural incomes, population decline, declining service provisions), which render attempts to characterise rural conditions according to specific territorial areas as inevitably 'misleading' (2004: 270). They propose, instead, the need for new characterisations and suggest 'the preserved countryside', 'the contested countryside', 'the paternalist countryside', and 'the clientelist countryside', all of which have distinct attributes and allow for greater differentiation of contemporary rural experience and, therefore, allow more directed policy intervention.

In response to the 'dearth of knowledge of the underlying factors that explain the uneven geography of economic performance across rural England,' Agarwal et al (2009: 309) propose and test a more integrated approach to the modelling of performance that includes consideration of the complex interplay between economic, human, social, cultural and environmental capital (also Bryden et al, 2004; Reimer, 2003). From their analysis, the authors highlight three areas that appear to contribute to greater productivity in rural areas: enterprise and investment (economic capital); accessibility and road infrastructure (economic capital); and skills and education (human capital). This leads to the following recommendations:

- The need for a rural entrepreneurship policy which focuses on encouraging high growth business developments which have the potential to maximise employment
- The creation of local economic hubs or clusters of related businesses in rural areas
- Rural-proofing of the provision of skills, training and education which also ensures that changes taking place in rural employment patterns are taken into account in future skills and education funding and planning (Agarwal et al, 2009: 318).

The Commission for Rural Communities argues that research on sustainable rural communities must incorporate a more nuanced understanding of the natural environment (CRC 2007). Similarly Shucksmith (2009) demonstrates how discourses of sustainability in both rural and urban contexts have been power laden and used to support sectional interests. He calls for a move towards more active communities determining rural sustainability in their local context.

Lowe and Ward (2007), in their review of rural development policy delivery, suggest that policy problems have arisen out of the dominance of an overly agricultural approach to rural development, the eclipse of rural affairs by environmental protection, and an urban-centred approach to rural and regional development. They suggest an urgent need for the strengthening of rural proofing across all levels and departments of government and the establishment of a rural proofing unit in Defra (also Atterton, 2008). In particular, Lowe and Ward lament a view of sustainability in rural areas only in terms of preservationism. They argue that rural spaces should not be seen only as spaces of consumption but as 'attractive locations for growth-oriented businesses and sustainable communities' (Lowe & Ward, 2007: 312). They argue that sustainability needs to be considered in terms of a wider range of criteria (cf Agarwal et al, 2009) and that 'the enterprise, diversity and potential of rural communities need to be championed as assets without which wider society would suffer' (Lowe & Ward, 2007: 316). Such an approach would move away from viewing rural areas as passive recipients of policy support, and toward a realisation of their potential through better-policy making across a spectrum of issues (Atterton, 2008). The economic potential of rural areas through greater economic, social and environmental integration is elaborated in the following theme.

Theme two: Integrating economic, social and environmental assets to realise the potential of rural areas: the case for a rural eco-economy

It is increasingly recognised in the literature that the quality of natural assets can be both a driver, and constraint upon economic activity (Winter & Rushbrook, 2003; Huby et al, 2007). High quality environments, combined with increases in 'green' consumerism, provide opportunities for both farmers and entrepreneurs in rural areas. However, remoteness or negative environmental impacts that result from poor development may serve to constrain business opportunities and performance (Agarwal et al, 2009: 311).

In recognising this need for linking environmental, social and economic resources in innovative ways to achieve the goal of sustainable rural development, Kitchen and Marsden (2009) put forward the concept of the eco-economy. They develop this concept out of the fields of ecological economics, eco-system service approaches, and ecological modernisation. The authors define an integrated and socially and spatially embedded definition of the eco-economy as:

'the effective social management of environmental resources (as combinations of natural, social, economic and territorial capital) in ways designed to mesh with and enhance the local and regional ecosystem rather than disrupting and destroying it. The eco-economy thus consists of cumulative and nested webs of viable businesses and economic activities that utilise the varied and differentiated forms of environmental resources of rural areas in sustainable ways. They do not result in a net depletion of resources but rather provide net benefits and add value to the environment and to the community' (Kitchen & Marsden, 2009: 289).

The success of the eco-economy, they conclude, will require both the State and local businesses to perform more ecologically modernising roles.

Theme three: Social capital and climate change adaptation

Adger (2003) and Adger *et al.* (2009) argue that the capacities for societies to adapt to climate change are bound up in their ability to act collectively. It follows, therefore, that maintaining and enhancing social capital can be seen as a means of protecting the environment, as well as adapting to environmental risks (Pretty & Ward, 2001). Societies, and particularly rural societies, can be seen to have experience of dealing with climatic hazards. Moreover, the social mechanisms (such as networks and reciprocal relations) that have been employed to deal with previous incidents provide a source of capital which provides adaptive potential for future risks.

Adger *et al.* argue that the limits to adaptation are to be found within society and reliant upon ethics, knowledge, attitudes to risk and culture. They suggest these limits tend to be subjective, changeable and socially constructed in specific places. Understanding the limits and opportunities for adaptation, therefore, requires a better understanding of these processes. Moreover, the mitigation and adaptive capacity of communities is heightened when actors perceive adaptation to, and the risk of climate change, as being within their powers to alter (Adger, 2003: 401). Adger recommends, therefore, the establishment of mechanisms of trust and cooperation between actors in the state and civil society which are built from the bottom-up and are based on local social capital, perhaps building on the lessons learned from the Australian Landcare Management movement. Such mechanisms, it is argued, can transfer perceptions of climate change from a global to a local level and heightens local communities' predisposition to take adaptive and - more particularly – action for mitigation.

Cross cutting and overlap issues

Framing local processes within the context of broader structural changes; seeking means for policy to be sensitive to, and accommodating of local difference, and; the links between the economy, social capital, effective management and environmental protection are all of cross-cutting relevance to other policy areas. Enhancing and capturing the value of natural resources, in particular, is relevant across all policy-areas since it recognises the role of the natural environment, and of natural science policy, in contributing to the wider objective of sustainable rural development. Many local areas may contribute more widely to public goods for example the English uplands contain cultural and natural assets that could support a low carbon future and require appropriate incentives for land managers and wider recognition of the benefits (Shucksmith, 2009; RELU, 2010)

Description of remaining research gaps

The literature suggests that there is scope for considerable further research in the following areas:

- How to improve monitoring of the role that the natural environment plays in sustainable rural development, particularly in relation to non-farm rural business and livelihoods.
- Rural areas have an important part to play in reducing greenhouse gas emissions. Further research is required to better understand the role that rural areas can play to reduce emissions within the context of changing economic and social arrangements i.e. the role of rural areas in the transition to a low carbon economy.
- There are opportunities for rural communities to better capture the public value of rural environments. In order to facilitate this, further research is required into the public values held for different environmental assets, and the mechanisms for translating this value into financial benefits for those responsible for 'producing' and maintaining the valued environments. For example, the

role of uplands in storing carbon as well as providing water for urban communities and providing business opportunities for game managers, farmers and tourism industries.

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8. Marine and Freshwater Fisheries Policy

This summary paper is one of eight that reports on a rapid overview of the social science literature relevant to Defra's Environment and Rural Group (ERG) policy areas. Together they form an output from Phase One of the Defra-funded project '*Social science evidence review to inform Natural Environmental policy*' (Defra project NE0109). Whilst it is believed that these overview papers will be useful to the work of policy-makers across Defra's delivery landscape, they are not intended to represent a fully comprehensive review of all social science literature in this policy area. The reviews were necessarily completed in three days, primarily searching the Web of Knowledge database, focusing on literature from 2000-2010, supplemented by targeted searches of key organisational websites. Search terms were developed based on relevant ERG policy objectives as identified in Government Strategy documents, produced prior to the 2010 General Election.

Marine and Freshwater Fisheries Policy objectives

This overview seeks to address the marine policy objectives outlined in '*Fisheries 2027*', '*Our Seas - A Shared Resource*' and '*Charting a new course*', and freshwater fisheries policy objectives found in '*A Better Environment, Healthier Fisheries*' (Environment Agency, 2006). An assessment of the level of social science research relevant to each of these specific policy objectives is provided in Table 3.

Table 6 – Assessment of the level of social science literature for each policy objective

	Policy objective	Description of relevant social science research
Significant	How to reduce the impact, and improve the sustainability of fishing	Significant social science research, particularly relating to the establishment of effective governance
	Ensuring that those with a stake in the marine environment have a role in the decisions that affect them	Significant amount of research on stakeholder participation in marine management (e.g. Special Edition of <i>Marine Policy Journal</i> 32(2) 2008).
	Embedding an ecosystems approach in fisheries	Significant amount of research on the establishment of sustainable approaches to management following international and national policy obligations
Some	Encouraging the use of the precautionary approach	Some social science research, relating to the importance of a precautionary approach to governance structures as well as natural systems.
	Understanding consumer demand for sustainably produced fish	Some social science research from Europe, but less from a UK perspective.
	Understanding and minimising drivers of unsustainable harvest	Some social science research examining fishing practices in this regard.
	The contribution of fishing to local economies and the culture of coastal communities	Some social science research, particularly relating to fishing as a 'way of life', providing happiness and acting as a barrier to structural changes
	The influence of climate change on fisheries and stocks	Some social science research (e.g. Special Edition of <i>Marine Policy Journal</i> 31(1) 2007) but majority from a natural science perspective.
	Management of fisheries flexibly	Some social science research, particularly relating to the establishment of effective governance
	Encouraging wider appreciation of the non-use benefits of the marine environment	Social science examines the incorporation of non-users into decision-making processes which requires a wider appreciation, often achieved through recognition of environmental services.
	Diversification of fishing communities into non-fishing activities	Some research examining happiness and well-being associated with fishing work, and the reluctance to give it up despite falling returns.
	Identifying sources of pollutants, contaminants and toxins, and the drivers behind marine pollution	Some social science research examining fishing practices in this regard.

	Ensuring that marine, land and water management mechanisms are responsive and work effectively together	Some social science research incorporated into the development of integrated management approaches.
Limited	Fisheries to play a greater role in England and Wales to encourage more people to help and protect the environment and help fishing to contribute more to society	Limited literature concerned mainly with economic appraisal of salmonid fisheries to local economies. Some development of public mobilisation through development of recreational angling

Key:
Significant social science literature
Some social science literature
No or limited social science literature

There is significant social science research in the area of *marine* fisheries, and particularly in relation to the broadening of the management of marine resources beyond a pure focus on fisheries. Much of the research relates to the challenges of meeting international and national obligations for the sustainability of marine environments. The significant level of existing social research reflects the international and complex nature of the management problem. Further social science research will be essential to facilitate effective monitoring and adaptation of new governance structures.

In contrast, there has been relatively limited academic research relating to *freshwater* fisheries in England and Wales. The Water Framework Directive has, however, proven to be a significant driver in acknowledging the role of recreational anglers in managing and observing the river environment.

An overview of the social science research

Significant social research has been carried out in relation to marine fisheries from policy and management perspectives. In particular the *Marine Policy* journal contains a large body of recent and relevant research. Additional research has been conducted from the perspectives of fisheries management, environmental management, ocean and coastal management, resource economics, conservation, international law, biology, environmental politics, marine science and human geography.

The major concern of social scientists working on freshwater fisheries issues has been with the economic benefits that angling can bring to local communities, though work has also been done to explore the benefits of angling for young people with behavioural and educational problems. The diverse types of anglers and angling activities and in England and Wales have meant that angling has remained largely invisible. Much of the literature concerning the social science of recreational angling focuses on central Europe and Scandinavia.

The key themes to emerge from this overview include:

- **Theme one:** Approaches to the management of marine resources and ecosystems.
- **Theme two:** Linking recreational angling to the freshwater fisheries environment.
- **Theme three:** Public perceptions of the marine and freshwater environment.

Theme one: Approaches to the management of marine resources and ecosystems

A significant body of social research examines marine and fisheries issues from a management perspective. This tends to emphasise the potential and realised benefits of encouraging wider stakeholder participation in the management process (e.g. Berghofer et al., 2008; Delaney et al., 2007; Frid et al., 2005, 2006; Gilliland & Laffoley, 2008; Helvey, 2004; May, 2008). There is less research that has provided critical analysis of approaches that incorporate wider stakeholder involvement, including the importance of stakeholders' attitudes (Gelcich *et al.*, 2005), the differential privilege of scientific and local knowledge (Griffin, 2009) and issues of governance and power (Jentoft 2007a, 2007b).

There is much variation in the terminology associated with marine management approaches, which has led to inconsistencies and overlap between different terms (Bruckmeier et al., 2005; Douvere, 2008). There has been a shift in emphasis from 'co-management' approaches (which seek to incorporate the interests of the fisheries industry and government) towards 'ecosystem-based' management approaches (which incorporate a broader range of stakeholders and focus on the broader services provided by the marine environment, such as conservation).

Principal challenges relating to ecosystem-based approaches include: a) how to identify the relevant stakeholders; and b) which tools to use to best incorporate these stakeholders into decision-making processes in a fair and equitable manner to ensure genuinely sustainable management practices. This is particularly difficult since fisheries and coastal governance has been identified as a "wicked problem". That is, it is difficult to define and delineate from other problems and cannot be solved once and for all but has a tendency to reappear (Jentoft & Chuenpadgee, 2009). Jentoft & Chuenpadgee maintain that 'wicked problems' have no absolute technical or scientific solution and so governance must rely on the collective judgement of stakeholders. This perspective emphasises the need for ecosystem-based management approaches to consider socio-economic factors alongside traditional ecological concerns (Frid et al. 2005). Rogers and Greenaway (2005) emphasise that such socio-economic issues have not been given sufficient attention in the UK nor are they adequately integrated into ecosystem-based approaches, which tend to focus on broader sets of conservation indicators. A particular challenge for policy-making is to deal with the inherent uncertainty and dynamism of both natural and socio-economic systems. On this basis, Hilborn et al. (2001) argue that a precautionary approach to management should focus not just on fisheries and marine resources, but also on local fishing communities, the structures of governance and the interaction between natural and social systems (also de Santo, in press).

The uncertainty involved in marine management has led researchers to call for greater stakeholder integration and participation in governance structures, and for those structures to be adaptive, experiential, interactive and deliberative (Murawski, 2007; Gaichas, 2008; Jentoft & Chuenpadgee, 2009). The development of more adaptive, responsive governance structures will require further social science research, and additional monitoring of, and research into, the management process.

Theme two: Linking recreational angling to the freshwater fisheries environment

Much of the social science literature on freshwater fisheries in the UK is dispersed through organisational websites or in consultancy reports. This may reflect the largely local scale and therefore highly specific nature of much of the research in this area. Furthermore, freshwater fisheries are used mainly for recreational purposes and, although angling is a significant past-time, it has not attracted significant research interest (one exception is Oughton *et al.*, 2009).

Nonetheless, the Environment Agency has acknowledged the need to consider seriously the socio-economic aspects of angling, and has commissioned a range of studies exploring the economic value of angling. Mawle

and Peirson's '*Economic evaluation of inland fisheries*' (Environment Agency, 2009) study, for example, highlights that expenditure on freshwater angling in England and Wales supports £1 billion of household income, equating to 37,000 full-time jobs in these countries, and estimates the overall economic loss to society from a severe decline in salmon stocks as a £350 million loss in welfare. It also reports on public perceptions of salmon rivers in England and Wales, with most perceived to be of only 'moderate' environmental quality. The public were found to be willing to pay two to three times more to prevent deterioration in river quality than to improve it.

Research highlights that recreational angling affects the ecology of rivers and still waters (Hickly and Chare 2004), can provide a range of ecosystem services (Butler et al 2009), and suggests that anglers can provide significant knowledge and management activities necessary for the implementation of the Water Framework Directives.

Important research is being carried out on the social benefits of angling by the 'Social and Community Benefits of Angling' project (<http://www.anglingresearch.org.uk/>), which builds on earlier work demonstrating the benefits of angling to disadvantaged young people. The '*Public Attitudes to Angling*' survey, conducted by the Environment Agency (2010) highlights that attitudes to angling in England and Wales remain positive, with 74% respondents agreeing that angling is an acceptable pastime and 61% agreeing that angling fits in well with others activities. Furthermore, 12% of those people who have not been fishing in the last two years are 'very' or 'fairly' interested in going in future, suggesting there are more than five million potential freshwater anglers. The most important factors thought to encourage people to go fishing include having someone to go with, local places to fish, and information on how to fish. 64% respondents agreed that angling is an indicator of good water quality.

Theme three: Public perceptions of the marine and freshwater environment

A final theme to highlight relates to public perceptions of marine and freshwater environments. This has close links to the wildlife and biodiversity policy area, and the water quality, and people and landscapes policy areas.

In the searches undertaken for this theme, few references were found in relation to public perceptions of seascapes or of marine or freshwater biodiversity, which may correspond to a research gap in this area. An important reference to note, however, is the study for Natural England by Rose *et al.* (2008), which utilised both qualitative and quantitative research to explore public perceptions of the undersea environment in England. This study concluded that UK and international studies exploring public perceptions of the marine environment are relatively few (with the exception of surveys carried out by WWF Cymru in 2007, Greenpeace in 2002, Wildlife Trusts in 2007 and York University in 2006), while those concerning the undersea environment are effectively non-existent. Generally, when asked to focus on the English undersea environment, public reactions are negative, with views summarised as disgust, shame and guilt at pollution, and sadness and regret that it has got into such a bad condition. People do assume some responsibility themselves for its degradation, but also blame industry and Government or other authorities. They are much more reluctant to blame local fishermen, who are generally thought of as 'heroic' or victims than perpetrators of damage. There are regional variations in perceptions, with those living in Northern England often more likely to describe their sea as dirtier and colder than the rest of the country, primarily blaming industrial pollution. From a quantitative survey of approximately 4000 respondents, less than 0.5% could name an actual undersea topographic landscape or location-specific feature, and less than 0.5% could name a particular species making up a real undersea habitat.

Cross cutting and overlap issues

Despite significant research there is a continuing need to identify and incorporate a broader range of stakeholders into decision-making. Mikalsen and Jentoff (2001) identify stakeholders according to three attributes; power, legitimacy and urgency in the decision-making process. They define three types of stakeholder: *definitive* stakeholders possess all three attributes (such as fishers and bureaucrats); *expectant* stakeholders will have two attributes (e.g. environment groups); and *latent* stakeholders include those whose stakeholding is defined according to only one attribute (e.g. consumers and citizens).

To this end, the policy and research challenge requires the following questions to be addressed:

- i) How to generate greater public interest in fisheries management;
- ii) How to secure diverse participation without undermining the need for efficient decision-making;
- iii) How to make stakeholders focus on the public interest, and
- iv) How to educate and train new participants unfamiliar with the concepts of fisheries management (Mikalsen & Jentoft, 2001).

These questions need to be addressed and further social research undertaken to inform the development of more adaptive and flexible governance structures in relation to marine management.

Many of the most significant management challenges associated with the freshwater fisheries environment overlap with those of the marine environment. The governance and implementation of work on eel and salmonid conservation, for example, links marine and freshwater interests and feeds into issues of biodiversity conservation and the wider provision of ecosystem services from the natural environment.

Remaining research gaps

Despite the relatively large quantity of existing social science research in this area, the nature of the marine management problem necessitates ongoing social science research across the spectrum of objectives outlined in Table 3. Particular gaps identified in these rapid searches relate to:

- Public understanding of, and concern for, the impact of climate change on marine and freshwater fisheries resources.
- Public awareness of how policy measures (such as marine conservation zones, marine protected areas and quotas) and consumer choices can help prevent further collapse of fish stocks and marine biomass.
- Linked to the point above, understanding the preferences and perceptions of the UK public in relation to sustainable fish consumption and production methods.
- The role of NGOs within the wider marine stakeholder engagement process.
- How stakeholder involvement may lead to the empowerment of some marine interest groups at the cost and marginalisation of other groups.
- The ways in which anglers (sea and freshwater) can contribute to the development of healthy ecosystems, including marine and freshwater fisheries. Linked to this is the role of volunteers in the implementation and policing of marine and freshwater policy, and the interest of anglers in supporting government monitoring and enforcement activities. The role of volunteers in *terrestrial biodiversity conservation* has been studied by social scientists, but much less so in freshwater environments.

- How anglers might organise themselves to better support the development and continuation of the sport.
- Public understanding, perceptions of, and interest in, marine and freshwater biodiversity.

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ANNEX 5. Scoping for the Perceptions Review

ANNEX 5a. Mapping Policy Priorities: The Perceptions Review

INTRODUCTION

This note sets out the mapping activities undertaken to identify a defined and policy-relevant theme for an in-depth review of social research in relation to the theme of ‘perceptions of change to UK landscapes and ecosystems’. Since the scoping report overviews, LUC held a workshop with social researchers and a small number of policy-makers, and has also undertaken informal telephone interviews with members of Defra’s landscape and outdoor recreation programme and Natural Environment Strategic Unit teams.

WORKSHOP

The workshop highlighted the breadth of the theme in terms of relevance to Defra’s natural environment policy teams and in terms of the amount of relevant social research available. Three overarching questions emerged from the workshop, as highlighted in the table below. A number of specific topics related to these were also identified, which are presented in Table 1.

Table 1. Priorities questions and themes to emerge from the workshop

Key question	Related themes
1. How and why do people currently value/appreciate certain landscapes and ecosystems?	<ul style="list-style-type: none">• The extent to which people are conscious of landscapes and ecosystems.• How people understand what landscapes and ecosystems are.• How peoples cultural backgrounds and geographies influence their understanding of landscapes and ecosystems and their preferences for different types of landscapes or ecosystems.
2. How do people respond to changes to landscapes and ecosystems and what are the implications of this for the public acceptability of future change?	<ul style="list-style-type: none">• The extent to which responses are affected by where people are situated in relation to this change (physically and socially).• How peoples understanding of the lifecycles of natural systems influences their response to future change.• What are the key factors that influence people’s responses to future environmental change?• How are peoples responses to this change affected by the control people feel they have over change?• What changes to landscapes/seascapes and ecosystems do people consider to be acceptable?
3. How do key actors and opinion formers (e.g. the media and NGOs) influence these values and responses?	<ul style="list-style-type: none">• Which key actors and opinion formers do people trust?• What are the most influential methods of communication used by these key actors and opinion formers?

The Project Steering Group asked that the project focus on Question 1, with a view to understanding Question 2.

PRE-ELECTION POLICY MAPPING

A number of policy strategy documents were identified by Defra at the Scoping Stage. These were used to identify policy objectives on which the scoping-stage overview reports would be based. Policy objectives in these strategy documents were considered in terms of the ‘perceptions of change’ theme to understand how social research of relevance to the theme could feed into the policy development process in relation to the objectives.

Policy objectives from these documents, along with additional documents of relevance from Natural England and the Forestry Commission⁸ relevant to the theme of ‘perceptions of change to UK landscapes and ecosystems’ were mapped together to identify where there might be any potential overlap which could guide the focus of the review within this theme.

This process involved several stages, including the production of a table to identify which of the objectives identified were of most relevance to the theme, and where possible the implementation measures already in place which findings from a review on the theme could feed into. It was difficult to accurately identify the relevant information for all of the objectives. Objectives were then physically ‘mapped’ using a thought-map style diagram to identify how the broad range of relevant objectives related to each other, in order that common themes and priorities could be identified to form the focus of the review.

There were several overarching common policy themes which related to objectives from all of the strategies:

- Recognition of the extent to which people have an impact on the landscape through use [or lack of use] of it, and that they can also act as stewards of those landscapes.
- Ensuring effective adaptation of landscapes to change in a way which is beneficial for the people who use and experience them.
- Managing biodiversity, landscapes and ecosystems for their intrinsic value.
- Encouraging people to use and experience different landscapes and ecosystems...the role of landscapes and ecosystems in quality of life/provision of cultural services.
- Types of change. The policy objectives mention ‘landscape change’. Climate change and biodiversity degradation were the only ‘types’ of change specifically mentioned in the objectives.

⁸ Natural England ‘Future Landscapes’ and ‘All Landscapes Matter’ position Statements (2010), Forestry Commission Corporate Plans for England, Scotland, & Wales.

POST-ELECTION MAPPING

In order to gain an understanding of emerging policy priorities following the change of government, discussions were held with Robert Bradburne and Ian Barrett of Defra, and e-mail correspondence with Andy Wharton of Natural England. These discussions were held in June 2010 shortly after the new coalition was elected in Government. The overarching message was that the policy context for Defra's work was temporarily uncertain as the new Government begins to develop its natural environment policy strategy.

Box 1. Priorities set out in the Coalition Agreement

In the statement for 'the environment, food and rural affairs' (**Bold type indicates priorities identified in interviews**)...

The Government believes that we need to protect the environment for future generations, make our economy more environmentally sustainable, and improve our quality of life and well-being. We also believe that much more needs to be done to support the farming industry, protect biodiversity and encourage sustainable food production.

- *We will introduce measures to make the import or possession of illegal timber a criminal offence.*
- ***We will introduce measures to protect wildlife and promote green spaces and wildlife corridors in order to halt the loss of habitats and restore biodiversity.***
- ***We will launch a national tree planting campaign.***
- *We will review the governance arrangements of National Parks in order to increase local accountability.*
- *We will work towards full compliance with European Air Quality standards.*
- *We will take forward the findings of the Pitt Review to improve our flood defences, and prevent unnecessary building in areas of high flood risk.*
- *We will examine the conclusions of the Cave and Walker Reviews, and reform the water industry to ensure more efficient use of water and the protection of poorer households.*
- *We will work towards a 'zero waste' economy, encourage councils to pay people to recycle, and work to reduce littering.*
- *We will reduce the regulatory burden on farmers by moving to a risk-based system of regulation, and will develop a system of extra support for hill farmers.*

In the Communities and Local Government section:

- ***We will maintain the Green Belt, Sites of Special Scientific Interest (SSSIs) and other environmental protections, and create a new designation – similar to SSSIs – to protect green areas of particular importance to local communities.***

At the time of these conversations, the Coalition Agreement was the only document indicating the potential direction of Defra's natural environment policy strategy. Relevant points from this

documented are highlighted in Box 1, drawing out in Bold type those which mirror the priorities discussed with policy representatives.

Key Issues raised in the interviews (anonimised)

- Need to understand more about urban landscapes and not just countryside (the urban chapter of the NEA was noted which will not be finalised until September).
- Also stemming from the NEA chapters being reviewed, an interest was expressed in how a heritage designation (or just knowledge of historical significance) affects how people feel about places. How does it affect character? And why? A question was raised about whether there has been any research on the impact of the designation of the South Downs National Park, and how people's perceptions of it differ before and after designation.
- An understanding of place was also discussed, i.e. how personal understanding of a place affects personal perceptions of it. How is understanding/perception affected by how linked you are to a place (i.e. how differs if you live in, work at, visit or are just aware of a place)? It was noted that a better understanding of this would assist with value transfer techniques.
- What elements of landscapes and ecosystems affect wellbeing? Physical structure or knowledge that it is biodiverse? What do people notice as biodiversity? What do they consider to be biodiverse? What do people understand as change?
- How does rarity/scarcity affect perceptions? Is something appreciated more because it is rare? It was noted that this is important when defining protected areas...should they look like protected areas?
- In terms of considering change, a key issue noted was the importance of an understanding of what is the right landscape to maintain/conservate? What are we aiming for? What are the influences of nostalgia on this? Is there any research looking at perceptions of landscapes that have changed in the past and whether people have noticed that change?
- It was agreed that there is value in exploring this theme within the context of influencing policy that can help deliver the localism agenda as well as the 'big society' philosophy (i.e. the ability of people to have a greater role in governance and societal choice). However, it was also argued that we must also understand how people perceive the big picture changes and challenges that our landscapes face, not only on their doorsteps, but across the country and within a global context.
- In response to the question of 'whether it is the physical structure of a landscape which influences well-being and/or the knowledge that it is biodiverse', it was noted that 'as well as physical structure (landscape character?) and biodiversity, you might also add perceptions, knowledge or understanding of landscape functions (what the landscape does for people). It would be good to see if there is any perception or understanding of the links between provisioning, regulating and supporting services and the cultural services (do they all together

influence well-being or is one service and thus particular characteristics and consequent experiential qualities, important to well-being)?

- What landscapes people want and what influences this (including nostalgia), what are we aiming for in terms of landscape?
- Yes, do people predominantly only consider the ‘scenery’ in terms of what they want or are there underlying functions that people want to see and if so does it matter if the ‘scenery’ changes in order to provide the functions they want. The Research Box work started to show the type of landscape structures and characteristics that people felt enabled the highest levels of experiential qualities and associated cultural services/benefits. It would be good to go on to understand further whether these ‘preferred’ landscape structures/characteristics are synonymous with delivering other ecosystem services (i.e. is there conflict between valued character and required functions, or can required functions also provide valued character).
- The third respondent also emphasised the importance of the coalition agreement, and stressed that we really can’t assume the relevance of pre-election policies but that information gathered will still be relevant.
- It was noted that we may not be able to add value by synthesising what people currently appreciate as ‘we know what people currently value...it is what they have now, what they already have’.
- The overarching question and concern is about climate change: How are the landscapes changing and how do people feel about that? What are people’s responses to ways to manage climate change e.g. windfarms (but noted we need to be careful as we don’t want the research to highlight that people are against windfarms).
- It was suggested that from the coalition agreement, the three key things of importance to this particular respondent’s team are:
 - The National Tree Planting Campaign
 - Joining up biodiversity with wildlife corridors
 - Protecting the greenspaces of importance to local people.
- In the light of this, relevant questions might include trees – where are people happy about trees? What are people’s perceptions of street trees? Should there be more on the urban fringe? What about on uplands?

COMMON THEMES FROM MAPPING

Common themes have been identified from the processes above, which are set out in Table 2 alongside the overarching questions of interest identified by the Steering Group.

Table 2. Common themes from mapping

Key question of interest	Related mapping themes
<p>1. How and why do people value certain landscapes and ecosystems?</p>	<p>a. Do people value local places for their: landscape character (physical structure); biodiversity; or in terms of what they provide to them - from food to emotional enrichment?</p> <p>b. How does nostalgia affect the value that people put on places and their biodiversity?</p> <p>c. How and why do people value local urban greenspaces and other green areas of importance to them?</p> <p>d. Is the relationship of people with place (including urban greenspace) affected by whether they live or work close by or are visiting the place?</p> <p>e. What role do trees play in the value that people place on local places?</p> <p>f. How does rarity / scarcity of biodiversity and types of place affect the value that people place on them?</p> <p>g. How do environmental designations affect the value that people put on places so designated?</p>
<p>2. How do people respond to changes to landscapes and ecosystems in urban and rural areas and what are the implications of this for the public acceptability of future change?</p>	<p>a. What changes in landscape and biodiversity do people expect to see in the future?</p> <p>b. What aspects of landscape and biodiversity change are seen as acceptable and unacceptable?</p> <p>c. What changes do people want to see in terms of landscape and biodiversity?</p>

DEVELOPMENT OF FINAL QUESTIONS. The common questions identified above have been combined/ refined into the following:

- Why do people value landscapes and ecosystems – is it because of their landscape character, biodiversity or the services they provide to them – from food to emotional enrichment?
- What are people’s likes and dislikes in terms of different landscape types (including urban greenspace), landscape components (including specific features such as trees), or ecosystems?
- How do preferences differ between local landscapes and more remote/distant places?
- How does designation (e.g. a statutory nature conservation designation) affect the value people place on landscapes or ecosystems?
- What changes have people recognised in landscapes and ecosystems in the last 50 years?
- Which of these changes are seen as positive, and which are seen as negative?
- How has this change affected people’s perceptions of these landscapes and ecosystems?
- What changes to landscapes and ecosystems do people expect to see in the future?
- What trade-offs between what people value in landscapes and ecosystems, and the management of future change, might people be prepared to see?

These were circulated around key people in Defra, and comments utilised to agree on the final nine sub-questions to be explored within the review.

ANNEX 5b. Workshop Report: The Perceptions Review

Social researchers, policy analysts and policy-makers were brought together in a half-day workshop in London on 25th March 2010, in order to identify the policy need and the unlocked existing social science potential in relation to this theme in order to guide the next phase of the social research review project - the in-depth review.

Attendees were asked to keep the following in mind during discussions:

‘What existing social science evidence can most usefully be synthesised and reviewed to help policy and decision-makers to ensure better management of natural landscapes, seascapes and/or ecosystems, particularly in light of current and future pressures faced by these areas?’

In addition to background presentations about the project, participants were engaged in two key exercises. The first aimed to encourage attendees to start thinking about the social research they are aware of within this theme in relation to relevant policy areas, as identified from key policy strategy documents provided by Defra. Having allowed for wider discussion of the ‘perceptions of change’ theme in the first exercise, the second exercise sought to narrow the focus back down to *specific* social research questions that could be asked in the Stage 2 review, and in relation to which types of landscapes/seascapes and ecosystems. This workshop note summarises the key findings from each of these exercises, together with the overall workshop conclusions.

KEY FINDINGS FROM EXERCISE 1

It was suggested that key bodies of potential social science evidence to review of relevance to this theme could be categorised as follows:

- **Bodies of evidence that have been reviewed but have not yet been made accessible to Defra;**
 - Literature on the links between natural landscapes and human health and wellbeing is currently a major policy driver in Scotland but seems much less so in Defra (though has been an important focus of Natural England). This may be of relevance to this theme as public perceptions of the personal wellbeing benefits they gain from natural landscapes may influence their values and perceptions of acceptable change.
 - Since many reviews have already been produced in the area of the environment and health/wellbeing, it was felt that efforts would best be focused on mapping the literature/reviews in this area in order to make the information much more accessible and available to Defra policy-makers, and to illustrate how the findings relate to different Defra policy areas.
- **Bodies of evidence that have been reviewed in the past but not updated in recent years;**
 - Considerable discussion focused on how the perceptions about landscapes and landscape change vary amongst individuals and groups from different cultural backgrounds and different demographics. It was felt there would be considerable value in undertaking an up-

to-date review in this area, particularly given the changing cultural and demographic make-up of the UK (e.g. an increasingly ageing population).

- Also linked to this was the suggestion that it may be useful to review existing evidence exploring how the environment in which people live (and the way in which they engage with nature) conditions their understanding, values and perceptions of the natural environment, and their concerns about future change.

- **Bodies of evidence that may have been synthesised for other departments but whose relevance to Defra may have been overlooked;**

- The vast literature on place-making (i.e. sense of place, sense of heritage, place attachment, links between place and self-identity) that may have been reviewed for the Department for Communities and Local Government in the context of sustainable communities, could usefully be reviewed in the context of natural landscapes and landscape change. This could link into theories of biophilia and topophilia.
- Often people harbour negative perceptions of change because of a tendency to favour the status quo or due to a sense of nostalgia of what it used to be like i.e. the 'legacy' issue (this is the idea that the landscape that people think they remember as a child represents the baseline for change, and may influence their behaviours, values and attitudes in relation to such natural environments).
- In addition the point was made that not all change is necessarily perceived as negative and that there may be value in trying to identify research where change has been perceived as positive and why.

- **Bodies of evidence that could be 'mined' to explore a different type of question; and**

- Much discussion focused on what could be learned from renewable energy siting controversies, particularly in relation to the way in which people have opposed climate change mitigation developments that change their local landscapes.
- This review area could provide useful insights into likely public responses to proposed management efforts to mitigate/adapt landscapes to future climate change i.e. the 'green on green' issue.

- **Bodies of evidence that would be interesting to synthesise but are already well acknowledged in Defra.**

- How people value 'unseen' landscapes (e.g. the undersea environment) and their concern about change to such areas. It was felt that this could relate to existing work exploring intrinsic values ascribed to nature.
- The degree to which peoples' values are shaped by the knowledge they have e.g. whilst an ecologist would consider peat bogs and mudflats to be highly valuable, these values are unlikely to be shared by the general public without an appreciation of their ecological value.

Efforts were made to link these and other priority areas to three broad policy areas of interest, and specific sub-themes within these areas, as illustrated in Table 1 below.

Table 1. Social research areas that may be considered under the key themes and sub-themes of interest

Broad theme	Specific sub-themes	Potential social research areas to consider
<ul style="list-style-type: none"> Understanding what people value in the environment 	<ul style="list-style-type: none"> Understanding why people value landscapes and how this influences their use of, attitudes to, and behaviour in such areas. Encouraging wider appreciation of the non-use benefits of ‘unseen’ landscapes (<i>previously read, ‘of marine environments’ but area altered in discussion</i>). Ensuring people from a wider range of backgrounds are able to access and enjoy the countryside. 	<ul style="list-style-type: none"> Review of responses to local history studies/local surveys. Studies of sense of place; relationships to place. Literature on different methodologies for understanding what people value now Nature of valuations (use value versus inherent value).
<ul style="list-style-type: none"> Understanding change 	<ul style="list-style-type: none"> Gaining a deeper understanding of people’s attitudes towards landscape change, and how these influence their expectations, perceptions and sense of place. Understanding the implications of climate change on landscape and how it is used, and the actions needed to enable our landscapes to adapt to climate change. 	<ul style="list-style-type: none"> Looking at the nature of change (Responding to positive / negative change; responding to speed of change – slow / fast; responding to perceived levels of threat). Methodologies for understanding change (e.g. visualisation, responses of insurance companies to events, and technologies). Work on future scenarios and responses to past changes.
<ul style="list-style-type: none"> Understanding the drivers of behaviour change 	<ul style="list-style-type: none"> Greater involvement, particularly by communities, in planning and managing landscape change. Understanding the role of key actors (e.g. NGOs and activists) in influencing behaviour change in relation to these landscapes. 	<ul style="list-style-type: none"> Understanding who people trust. Communicating and understanding different knowledges, such as local knowledge (e.g. knowing when and where it floods) and technical knowledge (e.g. understanding what climate change is and what causes it).

KEY FINDINGS FROM EXERCISE 2

Attendees were presented with a set of social research questions and potential areas to review within these which had emerged from the Stage 1 overview reports. Based on these discussions, key themes shortlisted for review included:

- Public concern and awareness about the direct and indirect impacts of environmental change on valued landscapes (It was noted that climate change may be the most important environmental change but that the social research on this issue may be limited).
- Public acceptability of landscape change; when is/isn’t it acceptable and why?
- What influences the value/action gap in relation to landscape/seascape & ecosystem change?

- Role of the media and NGOs in influencing public appreciation/perceptions of landscape.
- What landscape benefits/services do people value and why?
- Public awareness of potentially more intangible benefits provided by landscapes and natural systems, such as contributions to health, and quality of life.
- The potential influence of cultural background and physical geographies on perceptions of landscape change.

KEY CONCLUSIONS

Prof. Philip Lowe provided a useful summary drawing together the overlap between the discussions of both groups, suggesting the emergence of three key strands, one of which could be considered in this review:

- 1. How and why people currently value/appreciate landscapes/ecosystems.**
- 2. How people respond to future change to landscapes/seascapes and ecosystems and the implications of this for public acceptability of change.**
- 3. The influence of key actors and opinion formers on these values and responses e.g. the media and NGOs.**

ANNEX 6. Scoping for the Conflict Management Review

ANNEX 6a. Mapping policy priorities: The Conflict Management Review

INTRODUCTION

This note sets out the mapping activities undertaken to identify a defined and policy-relevant theme for an in-depth review of social research in relation to the theme of ‘conflict management within natural environment decision-making in the UK’. Since the scoping report overviews, CRE undertook informal telephone interviews with members of representatives from Defra and the Environment Agency, and held a workshop with social researchers and policy-makers, and has also referred to key strategy documents to identify overarching policy objectives to which the review could be of value (though recognising that some of these strategy documents were developed by the previous government).

PRE-ELECTION POLICY MAPPING

A number of policy strategy documents were identified by Defra at the Scoping Stage, together with initial documents such as the Third Sector Strategy. These were used to identify policy objectives on which the scoping-stage overview reports would be based. Policy objectives in these strategy documents were considered in terms of the ‘natural environment conflict’ theme to understand how social research of relevance to the theme could feed into the policy development process in relation to the objectives.

Policy objectives from these documents were mapped to identify where there might be any potential overlap which could guide the focus of the review within this theme. There were overarching common policy themes which related to objectives from all of the strategies:

- Ensuring effective and fair governance of land and soil and biodiversity.
- Understanding the social and economic drivers of biodiversity and land degradation, and the implications of this for future enjoyment of the natural environment.
- Understanding the role of, and facilitating, farmers, other land managers and communities to adapt to changing natural resource availability and quality in the face of climate change.
- Developing a better understanding in Defra, about the policy areas where co-design and early proactive engagement with the sector should be the norm, and those policy areas where informing and consulting third sector organisations are more appropriate.
- Facilitating strong place-based partnerships between third sector organisations and statutory organisations, which work together to improve environmental outcomes, strengthen rural communities and make best use of regional and local plans for doing so.
- To help facilitate collective action, community empowerment, informal learning and community solutions which protect the natural environment, and create sustainable and resilient communities – in urban and rural areas.

POST-ELECTION POLICY MAPPING

In order to gain an understanding of emerging policy priorities following the change of government, telephone interviews were held with Mark Bayliss, Richard Brand-Hardy, Giles Golshetti, Kirsty Inglis and Huw Thomas from DEFRA and William Cruickshank (Environment Agency). The interviews were analysed to reveal the areas of concern, the particular examples or cases to which they applied and the further work which the respondents thought important. These discussions were held in May 2010, around the time that the new coalition was elected in Government.

The overarching message was that the policy context for Defra's work was temporarily uncertain due to the election outcome.

The key issues around conflict in the natural environment identified by the interviewees included:

- Understanding and managing contrasting preferences and values toward natural resources amongst different stakeholders
- How can trust be engendered between stakeholders to minimise conflict scenarios?
- How can communication be used and tailored to reduce conflict?
- How is conflict instigated as a result of change? What are the dynamics of conflict? How do perspectives, values and positions change, deepen or subside over time?
- What is the importance of the production of evidence? Whose evidence and expertise? Under what circumstances is evidence seen as legitimate?
- Is it better to anticipate conflict and make contingency arrangements or is it more efficient and effective to manage it once it has occurred?
- How may methods of policy design and implementation reduce or exacerbate conflict?
- How can environmental trade-offs be resolved that operate at different geographical scales – e.g. local environment vs climate change?
- How can stakeholders that are vital to the ongoing sustainable management of a natural resource be kept on-board when they perceive decisions as being damaging to their interests?
- What part do institutional arrangements play in the emergence and persistence of conflict?

These issues provided the initial focus for discussions during the workshop.

WORKSHOP

The workshop brought together policy makers, researchers, managers, those responsible for policy implementation and other major stakeholders in the natural environment in order to: highlight priority issues for policy makers; obtain an overview of existing literature; and, to identify possible case studies.

The workshop highlighted the breadth of the theme in terms of relevance to Defra's natural environment policy teams and in terms of the amount of relevant social research available.

Following guided discussion, the Defra participants identified the following issues as the most relevant to their interests – in order of priority:

- How can trust be engendered between stakeholders to minimise conflicts?
- How do we understand and manage different preferences and values amongst different stakeholders?
- How can key stakeholders be kept engaged when they perceive decisions as damaging to their interests? AND How do we understand the relationships between human and spatial scales in the management of conflict? AND What drives conflict at the macro and micro level and how can these situations be anticipated and managed?
- What is the role of evidence? What counts as legitimate?
- How may the methods of policy design reduce or exacerbate conflict?
- How can communication be used and tailored to reduce conflict? AND What part do institutional arrangements play in the emergence and persistence of conflict? AND What is the role of intermediaries in conflict resolution and how can this role be developed?

It was initially suggested that the review should focus on the role of intermediaries in conflict management, with a view to being able to incorporate several of the ideas discussed during the workshop. However, subsequent discussions with Defra suggested the need to more explicitly broaden this out to include other types of intervention.

POST-ELECTION DOCUMENTARY ANALYSIS

Following the election, the relevance of many of the strategy documents produced by the previous government was called into question. When the Coalition Government has released documents outlining their emerging priorities and plans for natural environment-related policies, efforts have been made by the project team to map the relevance of this review to these emerging priorities.

The primary document of value has been the Draft Structural Reform Plan, which sets out departmental priorities and key actions. This review could be of particular relevance to two of these priorities:

- *The priority to support and develop British farming and encourage sustainable food production;* this review may contribute to issues associated with the competing uses of land and water resources within the natural environment.
- *The priority to enhance the environment and biodiversity to improve quality of life.* This review may provide useful insights relating to the actions to: support the building of the big society to enhance countryside, habitats and the urban environment; help communities and wildlife adapt to climate change; and, spearhead international progress on conservation and endangered species.

DEVELOPMENT OF FINAL QUESTIONS

Drawing on each of these activities, a series of common themes were identified and these were used in consultation with Defra to develop the sub-questions for review, which are highlighted in Box 1.

Box 1. Key sub-questions for review

1. What are the specific characteristics of natural environment conflicts, and how are these different from other types of conflict?
2. What sort of typology of natural environment conflicts is most helpful in analysing conflict situations and developing management strategies and interventions?
3. Which individuals or organisations (e.g. academics, local and central government, professional mediators or civil society representatives) intervene successfully in environmental conflicts and in what contexts?
4. What roles do those intervening play to achieve successful environmental conflict management outcomes?
5. How can trust be engendered with and between key stakeholders through intervention?
6. How can communication be tailored and used to accommodate and reconcile values, preferences and attitudes between stakeholders?
7. In what ways does the conflict context (e.g. environmental good/service, number of stakeholders, scale, geographic location, duration) interact with the intervention mechanisms above?
8. How can engagement of key stakeholders be maintained following a policy decision that they perceive as damaging their interests?
9. What approaches to conflict management or the wider policy development process work in actual or potential conflict situations, and which don't work, in what circumstances and why?
10. How is spatial scale important? At what scale should policy, delivery bodies or others seek to manage conflict, and what are the opportunities and challenges for greater management at more local spatial scales?
11. How can positive lessons from natural environment conflict management interventions best be incorporated into future policy development?

These activities also enabled the identification of a range of potential case studies to consider through the review, in order to ensure the theory discussed in the review is grounded in policy relevant examples of situations in which such conflict management approaches could valuably be employed.

Table 1 below sets out these case studies and their potential relevance to the Structural Reform Plan priorities.

Table 1. Case studies of relevance to Defra’s Structural Reform Plan

Departmental priorities outlined in Draft Structural Reform Plan July 2010	Priority Actions highlighted in SRP	Possible case studies	Key issues to be explored through case study
Support and develop British farming and encourage sustainable food production	Many of the actions discussed will need to consider the competing use of land and water resources with natural environment.	<ol style="list-style-type: none"> 1. Diffuse pollution from agriculture (Demonstration Test Catchments) 2. Natural flood management (Nottingham University study + others) 3. Bovine TB and management of badgers (RELU project) 	<ol style="list-style-type: none"> 1. Development of communities of practice to facilitate communication 2. Interest based conflicts 3. Entrenched and value based conflict – unresolved
Help to enhance the environment an biodiversity to improve quality of life	Support the building of the big society to enhance countryside, habitats and urban environment	<ol style="list-style-type: none"> 1. Severn Estuary 	<ol style="list-style-type: none"> 1. Successful example of collaborative management
	Help communities and wildlife adapt to climate change	<ol style="list-style-type: none"> 1. Presence and spread of non-native species 2. Natural flood management 	<ol style="list-style-type: none"> 1. Value based conflict, competing evidence bases
	Spearhead international progress on conservation and endangered species	<ol style="list-style-type: none"> 1. Marine conservation zones 2. INNS (Ruddy ducks) 3. Hen Harrier conservation versus grouse moor management 	<ol style="list-style-type: none"> 1. Participation, scale and governance 2. International conservation dimension 3. Interdisciplinary, use of decision support tools, framing analysis
<i>Support a strong and sustainable green economy, resilient to climate change</i>	<i>Potentially touches on the Ecosystems Approach to land management</i>	<ol style="list-style-type: none"> 1. <i>Multiple use of uplands, recreational use of uplands (RELU)</i> 2. <i>Energy versus food production.</i> 	<ol style="list-style-type: none"> 1. <i>Demonstrate strength of early engagement prior to conflict developing</i>

ANNEX 6b. Workshop Report: The Conflict Management Review

This workshop was convened on 20th May 2010, in order to explore the key question:

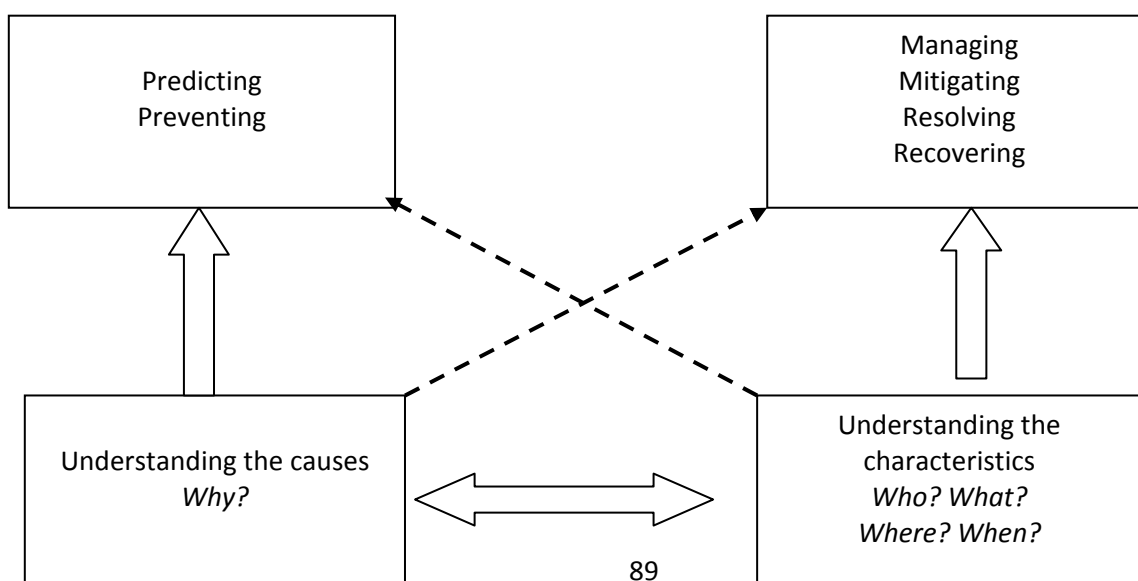
‘What existing social science evidence can most usefully be synthesised and reviewed to help those involved in conflict resolution within natural environment decision-making in the UK?’

The workshop brought together Defra policy-makers and researchers; academics with relevant research expertise, and; implementers, managers, regulators and stakeholders with firsthand experience and knowledge of natural environment conflicts in their everyday work. These three groups were brought together in order to address the following specific questions:

- *What are the priority issues for policy-makers and implementers that could be addressed through the formulation of a social science research question?*
- *What is the availability and extent of existing social science research that could be explored in order to address the priority issues that have been identified? Is it possible to review and synthesise the available literature in a novel way without duplicating existing research in order to add value and address the specific research questions?*
- *What case studies of natural environment conflict, and conflict resolution, could be incorporated into a focussed in-depth review of the literature in order to inform the specific research questions of interest?*

The context for, and objectives of the workshop were introduced by Professor Philip Lowe (Centre for Rural Economy), Simon Maxwell (Defra project manager), and Dr Liz Oughton (Centre for Rural Economy).

At the outset it was recognised and agreed that social science could offer insight beyond a narrow focus on conflict *resolution*, and the scope of the workshop was therefore broadened to a focus on conflict *management*, which recognises that social science can contribute to our understandings of the changing dynamics of conflict scenarios before, during, and following a conflict. In relation to policy-making questions, this was depicted as follows:



Following the introductory presentations the remaining, and most substantial part, of the workshop involved three specific activities. The first two of these were addressed in three separate groups to allow round-table discussion of the issues at hand. Prior to the workshop, we had carried out semi-structured telephone interviews with a number of people within different policy areas at Defra in order to identify more specific issues within the remit of conflict management that was of particular concern within their policy field, which are highlighted in Box 1 below. We used the comments from these interviews to structure the first activity.

Box 1. Significant issues around conflict in the natural environment taken from interviews

- Understanding and managing contrasting preferences and values toward natural resources amongst different stakeholders
- How can trust be engendered between stakeholders to minimise conflict scenarios?
- How can communication be used and tailored to reduce conflict?
- How is conflict instigated as a result of change? What are the dynamics of conflict? How do perspectives, values and positions change, deepen or subside over time?
- What is the importance of the production of evidence? Whose evidence and expertise? Under what circumstances is evidence seen as legitimate?
- Is it better to anticipate conflict and make contingency arrangements or is it more efficient and effective to manage it once it has occurred?
- How may methods of policy design and implementation reduce or exacerbate conflict?
- How can environmental trade-offs be resolved that operate at different geographical scales – e.g. local environment vs climate change?
- How can stakeholders that are vital to the ongoing sustainable management of a natural resource be kept on-board when they perceive decisions as being damaging to their interests?
- What part do institutional arrangements play in the emergence and persistence of conflict?

These issues provided the initial focus of discussions within the three groups. Each group, however, explored additional areas of interest by either reframing the existing issues in a different light, or by posing new issues not identified through the initial pre-workshop exercise. In each group the emphasis of discussion was very different and the pertinent matters arising from each are outlined below.

KEY FINDINGS FROM EXERCISE 1: “Identifying and prioritising key natural environment conflict issues”

Group A. Understanding contrasting preferences and values, engendering trust and the communication of evidence were discussed and assigned importance by Group A. In particular the following points were emphasised:

- Conflicts will always emerge and require management because there will always be perceived winners and losers associated with management decisions relating to a specific resource

- It is important to know and define the limits and boundaries of participation. It is important that those involved in consultation processes are aware of why the issue may be of relevance to them, and what their interests may be in the outcome of a particular decision or policy instrument
- There are insufficient means by which to assess whose benefits matter and should be considered in the process of decision-making
- It is important to ensure that the "right" evidence and the "right type" of evidence exists and is accurately communicated to those responsible for the management of resources on the ground. Uncertain, or conflicting evidence leads to mistrust in decisions and compromises the ability for consensus and agreement to be reached

In addition to these points, Group A also identified two further issues which were strongly supported as being relevant for conflict management. Firstly, several case studies were discussed which emphasised the role of intermediaries or "neutral" parties in the conflict management processes and showed how intermediaries successfully built trust and strengthened relations between different interest groups. It was identified as an issue for further scrutiny since questions remained as to who the appropriate intermediaries are in different conflict situations; what role intermediaries should perform; what skills should intermediaries possess; and, what is the role of academics as intermediaries? Secondly, Group A identified issues relating to scale as a pertinent issue for further scrutiny. This was emphasised in terms of the differential scale at which decisions are made and consultation or participation is encouraged as well as the different dynamics of conflicts occurring at different scales, or that have consequences (often competing) across a range of different scales.

Group B. Underpinning much of the discussion in this group was a concern with communication which was expressed as a concern with the use of evidence and the nature of participation and consultation in managing conflict and the situations where conflicts may arise.

- The behaviour of individuals within groups was discussed: the ways in which individuals may affect the working of a group and the extent to which stakeholders as individuals represent others within their industry- is representation appropriate/legitimate?
- It was noted that the role that an individual plays outside a group meeting may also be important in supporting the policy perspective even when the initial response of those affected may be negative.
- The significance of the timescale for discussions with stakeholders was regarded as important. There is a need to ensure that the time frame for engaging with stakeholders is sufficient and that there are opportunities for capacity building. (Results may be required within months whereas processes of negotiation could/should take years in some cases) however, some time pressure does discourage people from walking away from discussions
- There is a need to be more creative in finding common ground amongst stakeholders, possibly through developing relationships over time and working to understand other viewpoints. (People do change their minds.)

- Conflicts between the public and policy makers are more likely to arise over charismatic species and those charged with implementing policies can find themselves in caught in difficult situations
- More emphasis could be placed on the process of participation and decision making rather than actually trying to reach consensus. Consultations with stakeholders do raise expectations. It was noted that with increasing participation in decision making consultation may have less significance. The legal process may not support the outcome of consultations. Recommendations from stakeholder bodies need not be incorporated into law and this will undermine confidence in the process

It was noted that although there are mechanisms for participation and consultation in place the UK currently has a centralised state and that there are few opportunities for people to come together to bring about change in the natural environment for themselves at the local level compared, for example, with many low income countries.

As in groups A and C this group discussed the nature and quality of the evidence that different parties draw on to make arguments in conflicts

Group C. The communication and use of evidence, the role of scale and the importance of values and trust were central to the discussion of group C. There was a general agreement within the group that even supposedly 'impartial' evidence does not serve to change opinions but can actually polarise further entrenched positions. It was suggested that evidence needs to be conceptualised in a broader sense, beyond that of the impartial, rigorous and evidence-based natural scientific procedures to incorporate perspectives from the social science, to include social science research outputs as evidence too. Along the lines of the communication of evidence and the importance of scale the following points/questions were also emphasised:

- The ecosystems services approach may serve as a useful method for communicating evidence and risk in conflict scenarios by providing a neutral language which allows people to understand the broadest issues in their simplest terms
- What is the impact of the spatial scale at which decisions are made and conflicts occur?
- What are the consequences of conflicts that are caused at a location/scale other than the location of the specific conflict?
- Can conflicts at the local level be overcome by getting people to think about issues in a broader context? What should that broader context be?

Identifying the macro and micro scale drivers of conflict was highlighted as particularly important to understand by Group C. These issues link strongly with ideas of scale and with anticipating conflict in order to prevent or mitigate against the severity of conflict situations before they have arisen. Understanding the drivers of conflict at different spatial scales is poorly understood and, in particular, in terms of understanding how broader social, economic, environmental and political changes can have (possibly unforeseen) ramifications at a local level. It was posited within the group that there may be a need for a "change management" approach to conflict. Change management is commonly used in terms

of predicting the potential impacts of broader changes within institutional settings and it was suggested that this could be a fruitful approach for anticipating conflicts and making contingency arrangements before they occur.

From this process, any conflict issue or problem that scored four or more votes was taken forward into the second Workshop Exercise 2⁹. The votes allocated are illustrated in Table 1.

KEY FINDINGS FROM EXERCISE 2: “Considering the existing research base”

In Workshop Exercise 2 each of the three groups assessed the issues taken forward from Activity One in terms of the availability and extent of existing research on the topic, and in terms of the ability of the current project to provide novel and beneficial synthesis and review of that literature. The ultimate aim was to identify where a detailed in-depth review of existing literature could be undertaken without duplicating existing work. To this end the research issues to be taken forward had to meet two principal criteria:

- a. That substantial literature was available on the subject of interest
- b. That the current project could review and synthesise this literature in a fashion suitable for informing policy-making without duplicating previous research

Following assessment against these criteria, each group assessed whether the issues taken forward from Workshop Exercise 1 could be considered to provide a project *opportunity*, a research *gap* or a failure to provide *added-value*. A research *gap* was identified in situations in which a particular conflict issue was deemed very important but there was a lack of relevant existing research on the topic. A failure to provide *added-value* was identified in situations in which there was existing literature available but it had already been synthesised and analysed in a format suitable for informing policy-making and the current project would run the risk of duplicating this existing work were it to be taken forward. Finally a project *opportunity* was identified in situations in which there was substantial relevant research available and where that research could be reviewed and synthesised in a novel way in order to provide added-value to natural environment policy-making.

In each group, there remained a particular interest in the issues that had been identified by that group in Exercise One. As such, the three groups focussed particular attention and proposed *opportunities* for this project along three different lines: Group A maintained a focus on the role of intermediaries in conflict situation and on issues of scale; Group B maintained a focus in the role of values/trust and communication in conflict scenarios, and; Group C maintained an interest in the drivers of conflict at the macro and micro level and how to anticipate and manage potential conflict scenarios. The possible literature that could be utilised against these three principal areas of opportunity is outlined in Table 2.

⁹ Groups differed in size and had a different ratio of Defra and non-Defra participants. It is not possible to compare the distribution of dots across groups but looking down the column does give an accurate guide to the relative importance of each of the issues to Defra and non-Defra participants.

Table 1. Votes allocated to each issue by workshop participants

	Defra participants	Other participants	Total
How do we understand and manage different preferences and values amongst different stakeholders?	5	10	15
How can trust be engendered between stakeholders to minimise conflicts?	6	6	12
How can key stakeholders be kept engaged when they perceive decisions as damaging to their interests?	4	4	8
How may methods of policy design and implementation reduce or exacerbate conflict?	2	5	7
How do we understand the relationships between humans and spatial scales in the management of conflict?	4	2	6
What drives conflict at the macro and micro level and how can these situations be anticipated and managed?	4	2	6
How can communication be used and tailored to reduce conflict?	1	5	6
What is the role of evidence? Whose evidence and expertise? What counts as legitimate?	3	2	5
What is the role of intermediaries in conflict resolution? How can this role be developed?	1	4	5
How does conflict arise through change? How do values and perspectives change over time?	0	5	5
What part do institutional arrangements play in the emergence and persistence of conflict?	1	2	3
Is it better to anticipate conflict and take mitigating action or more effective to manage it once it has occurred?	0	2	2
What role can an ecosystems services approach play in providing a framework for negotiation and engagement?	0	2	2
How can collaboration and voluntary contributions be used to enable resolution?	0	2	2

Table 2. Social research literature of relevance to candidate review questions

Potential Research Question/Conflict Issue	Availability and Extent of Existing Research
Understanding the role of values, trust and communication in conflict management	<p>Broad literatures including:</p> <ul style="list-style-type: none"> • Game theory • Journals: Conflict, Environmental Psychology, Environmental Behaviours • Political science, Social psychology, Risk communication, Marketing, Public understanding of science literature • UNEP/OECD research • Farming and conservation literature • Existing Defra project "Role of Trust in ... " [Need to be wary of duplication] • EU project – European Biodiversity Forum EVK2-CT-1999-2006 • RELU programme research • Environment Agency - Building trust in communities [Need to be wary of duplication] • Trust as social trust – deliberative decision making e.g. scenarios research, RELU/ Jackie Burgess Tim O’Riordan/ Planning issues – ‘planning for real’.
The role of intermediaries in conflict situations	<ul style="list-style-type: none"> • Social capital literature in relation to the natural environment • Specific literatures on the role of academics as intermediaries • Office of Government Commerce research • Specific RELU flood risk research • Literature on the role of representative groups and of particular individuals • Existing Defra research undertaken by Brooklyn Hurst on the role of "mavens" or charismatic and influential individuals • Defra research from Reading innovation centre
The relationship between human and spatial scale both in terms of managing conflicts and the nature of conflicts	<p>Relatively little specific literature identified, although it was envisioned that issues of scale would be inherent in much of the literature pertaining to natural environment conflict resolution and management, and that novel synthesis and review could be undertaken along these lines.</p> <ul style="list-style-type: none"> • RELU programme research • Natural Care programme research
Understanding the drivers of conflict at the macro and micro level and how to anticipate and manage potential conflicts before they arise	<ul style="list-style-type: none"> • Social psychology, Behavioural economics, In-group and out-group, positionality and access to scarce resources literature • Solomon Asch Center research • Literatures on land use planning

KEY FINDINGS FROM EXERCISE 3. Case studies and group discussion

Throughout the day delegates were asked to record suitable conflict case studies that might be utilised by the project team in their in-depth review of the literature that would follow the workshop. In total, thirty-three case studies were added to the Case Studies Board, with details of the conflict and the specific issues to which it was relevant. This will be a key resource to the project team as the research progresses into the next stage and we will contact individuals who recorded specific case studies that we feel will be useful to address the particular issues that we take forward.

The final activity involved an open discussion between all delegates on the pros and cons of the particular issues that emerged following Workshop Activity 2. In addition, case studies of relevance to those particular issues were also flagged up. Brief notes on this discussion are outlined below:

Potential Research Question/Conflict Issue	Main Points of Discussion	Potential Relevant Case Studies
The role of intermediaries in conflict situations [Group A]	This was identified as a potentially focussed issue so long as its scope was different to the Defra research on mavens: <i>EV0408 The diffusion of environmental behaviours; the role of influential individuals in social networks</i>	<ul style="list-style-type: none"> • Defra Mavens report • RELU Flood Risk Research and the use of competency groups • Moray Firth conflict between seal management and fisheries. • Marine Conservation Zones • EU abolishment of set-aside and the Campaign for the Farmed Environment
The relationship between human and spatial scale in terms of managing conflicts and the nature of conflicts [Group A]	This was an important issue that all three groups suggested was inherent in all of their discussions. It was suggested, however, that this might be a research gap given a lack of specific research	<ul style="list-style-type: none"> • OGC research on customer insight • Moray Firth conflict between seal management and fisheries • Marine Conservation Zones
Understanding the role of values, trust and communication in conflict management [Group B]	These were identified as very broad yet very relevant issues. It was suggested that these issues would likely (and perhaps best) be addressed within a more focussed research question for the second stage of the project	<ul style="list-style-type: none"> • Defra Wildlife Management and Non-Native Species Report • Red-Cafe and Inter-Cafe Reports • Moray Firth conflict between seal management and fisheries • RELU - Deer management research • BioForum Project
Understanding the drivers of conflict at the macro and micro level and how to anticipate and manage potential conflicts before they arise [Group C]	There was debate as to whether the drivers of conflict needed to be better understood by policy-makers and whether a focus on this would provide added-value	<ul style="list-style-type: none"> • Literature from low income countries • Machibi Forest South Africa • BioForum Project

NEXT STEPS

The project team is now in the process of analysing how best to take the project forward for in-depth review in light of the findings from the workshop. In liaison with the Defra Project Steering Group we will decide where we have the greatest potential to provide novel and value-adding synthesis and review with regard to: the importance attached to particular issues; the availability of existing literature; the scope for additionality in research outputs, and; the ability to develop a focussed research question that can be adequately addressed according to the time and resource constraints of the project.

Finally, we wish to thank all of those who attended for their input on the day and to those that contributed but were unable to attend. We welcome feedback and comments on this summary and hope that you will be amenable to us contacting you again to follow-up particular ideas or case studies that we may look to develop in the next stage of the project.

ANNEX 7. Review Protocol: The Perceptions Review

1. Title: ‘Public perceptions of landscapes and ecosystems in the UK: how and why do people value current landscapes and ecosystems, and public attitudes towards future change’

2. Rationale

The ‘perceptions of change’ theme is one of three themes being explored in Stage 2 of the *Defra Social Research Review to inform Natural Environment Policy Project* (NE0109).

This theme is concerned with understanding people’s perceptions of change to UK landscapes and ecosystems. This has particular relevance to Defra’s Landscape and Outdoor Recreation, Wildlife & Biodiversity, and Ecosystem Approach policy areas, but could help to inform policy throughout Defra’s Environment and Rural Group. The White Paper discussion document ‘*An invitation to shape the Nature of England*’ (Defra, 2010a) emphasises the importance of natural value, and a need to understand the value of services provided by landscapes and ecosystems, in order to manage the environment in ways that ‘enhance its value to society whilst respecting its innate value’ (p.5). Understanding people’s preferences and dislikes in terms of current landscapes and ecosystems, and potential changes to these may encourage local action and participation from citizens and consumers, particularly if values are reflected in natural environment policy and its implementation.

Through scoping exercises undertaken at Stage 1 of the project, it was determined necessary to first understand what people *currently* value in order to understand how future changes to UK landscapes and ecosystems might affect these preferences. The first stages of the project have shown that there is a significant body of research on what people currently value about landscapes and ecosystems in the UK. However, in a review of evidence on public attitudes to environmental change, Upham et. al. (2009) identified that there was very little UK-based social research concerning public attitudes to future change. With that in mind, this review will address questions about how and why people currently value landscapes and ecosystems, and will then ask about perceptions of change to these, on the basis that there will be a manageable amount of social research results to synthesise.

Mapping of key issues and policy objectives and interests was used to identify the questions that will guide both the synthesis of social research findings and subsequent recommendations that emerge from the review. The process is essential for ensuring the useful application of review findings to policy teams. Mapping included:

- Consideration of outcomes from a workshop with researchers and some policy makers in March 2010;
- Mapping of policy objectives (First using relevant strategy documents from Defra’s Environment and Rural Group policy units, Natural England and the Forestry Commission); and then
- Telephone interviews with key members of Defra’s Landscape and Outdoor Recreation programme and Natural Environment Strategic Unit teams in June 2010.

In May 2010 the Government published ‘*The Coalition: our programme for Government*’ (HM Government, 2010) which was identified by policy teams as a key document to inform the focus of the review. Since these discussions Defra has published its *Structural Reform Plan* (Defra, 2010) and White Paper discussion

document ‘*An invitation to shape the Nature of England*’ (Defra, 2010a). Review questions have been developed on the basis of policy mapping, including the priorities emerging in these new policy documents.

The relevance of this theme to a number of different natural environment policy teams means that key shared policy priorities have been identified across the teams. The emerging review questions set out below have been checked with key policy teams, in addition to policy participation in the workshop.

3. Review using the principles of thematic synthesis

Thematic analysis is one of the most common methods for synthesis adopted in many approaches to evidence review (Pope *et al.*, 2007: 96), and tends to reflect the main, recurrent or most important themes arising in a body of evidence rather than seeking to develop a new explanation for findings that does not already appear in the literature.

Thematic analysis is particularly appropriate for this review theme as it has two pertinent benefits:

- The ability to organise and summarise the findings from a large and diverse body of research;
- The ability to handle both qualitative and quantitative findings, which is essential as this theme will need to review both qualitative social research findings and relevant quantitative findings, such as those identified in attitudinal surveys.

4. Review question and sub-questions

The overarching question identified as the focus for this review is: *‘Public perceptions of landscapes and ecosystems in the UK: how and why do people value current landscapes and ecosystems, and public attitudes towards future change’*

Through discussions with Defra and Natural England, the key users of this review, it was decided that the sub-questions highlighted in Box 1 would be used to explore this overarching question.

Box 1. Review sub-questions

1. Why do people value landscapes and ecosystems – is it because of their landscape character, biodiversity or the services they provide to them – from food to emotional enrichment?
2. What are people’s likes and dislikes in terms of different landscape types (including urban greenspace), landscape components (including specific features such as trees), or ecosystems?
3. How do preferences differ between local landscapes and more remote/distant places?
4. How does designation (e.g. a statutory nature conservation designation) affect the value people place on landscapes or ecosystems?
5. What changes have people recognised in landscapes and ecosystems in the last 50 years?
6. Which of these changes are seen as positive, and which are seen as negative?
7. How has this change affected people’s perceptions of these landscapes and ecosystems?
8. What changes to landscapes and ecosystems do people expect to see in the future?
9. What trade-offs between what people value in landscapes and ecosystems, and the management of future change, might people be prepared to see?

A separate note on the development of these questions is available in Annex 5.

5. Conceptual clarity/definitions

Box 2 briefly defines the key terms of relevance to this review in order to provide conceptual clarity.

Box 2. Key definitions

Value: ‘Value’ is considered in this review in terms of a recognised provision of services or benefits (including aesthetic appreciation). It is not considered in a monetary or economic sense.

Landscapes: The European Landscape Convention (ELC) defines landscape as ‘an area, as perceived by people, whose character is the result of the action and interaction of natural and/or human factors’ (Council of Europe, 2000).

Ecosystems: Ecosystems will be referred to in terms of the definition used in the National Ecosystems Assessment ‘A natural unit of living things (animals, including humans; plants; and micro organisms) and their physical environment’ (Defra Action Plan, 2007 in UK NEA, Progress Towards Delivery, February 2010).

The different types of ecosystem are categorised as: mountains, moors and heaths; semi-natural grassland; enclosed farmland; woodland; freshwater, wetlands and floodplains; urban; marine; and coastal margins.

Local landscapes and ecosystems: ‘Local’ landscapes have been taken to include all landscapes in the public realm which people consider to be local to them, whether this be in their immediate neighbourhood, village or town and rural landscapes that are immediate local to where they live.

Remote landscapes and ecosystems: This will be defined by the literature, but is likely to include places outside people’s neighbourhood or further from where they live or work.

Landscape Change: The study of landscape change is seen as a cross-disciplinary issue that is often articulated through the definition of the driving forces and power relations behind landscape change (Schneeberger et al, 2007 in Roe et al, 2010). Driving forces have been defined as ‘forces that cause observed landscape changes’ (Burgi et al, 2005) and the main types are seen as:

- Natural (Climate, topography, etc; natural disturbances) and
- Human (political, technological, cultural, socio-economic).

In the UK the particularly important drivers in policy terms are seen as agriculture and urbanisation, the open market agenda, the European Union agenda, and climate change (Roe et al, 2010 - Unpublished).

The review theme concerns perceptions of both landscapes and ecosystems. Work undertaken at Stage one of the project indicated that some studies concern specific types of place which may be either a landscape, or an ecosystem, or both, but that these studies may not make a clear distinction between these different types. The Table 1 below sets out some of the terms which may be used in the studies to

refer to landscapes and ecosystems. The first eight terms are those defined for the National Ecosystems Assessment (2005). The other terms are some of the landscape terms which have emerged from the literature. The table illustrates how some typologies (e.g. woodland) are a recognised ecosystems ‘type’ whilst also representing a landscape and potentially a feature or component of a landscape (e.g. woodland may be included in a wider landscape ‘view’).

Table 1. Landscape or ecosystem?

Term	Is this a Landscape?	Is this a Landscape Feature, Component or Element?	Is this an Ecosystem?	Is this an Ecosystem Feature, Component or Element?
Mountains, Moors and heaths	✓	✓	✓	X
Semi-natural grassland	✓	✓	✓	X
Enclosed farmland	✓	✓	✓	X
Woodland/Forests	✓	✓	✓	X
Freshwater, wetlands and floodplains	✓	✓	✓	X
Urban	✓	✓	✓	X
Marine	✓	✓	✓	X
Coastal Margins	✓	✓	✓	X
Green Space	✓	✓	X	X
Trees	X	✓	X	✓
Countryside/Rural Landscapes	✓	✓	X	X
Peri-Urban Landscapes	✓	✓	X	X
Hedgerows	X	✓	X	✓
Roadside Verges	X	✓	X	✓
Agricultural Landscapes	✓	✓	✓	X

6. Search strategy and scoping

The sub-questions above will be used to guide the search strategy and synthesis for this review.

To address the questions, there are three principle categories of search terms that will be explored: (1) ‘environment’ terms relating to landscapes and ecosystems; (2) ‘perceptions’ terms; and (3) ‘change’ terms. The suitability of these terms was tested according to CEE guidance and modified in order to refine the search terms and omit spurious hits. Trial database scoping searches were conducted using Web of Knowledge and modified iteratively. The final search terms utilised are outlined in the Table 2 below.

Table 2. Review search terms

1. Environment terms	Landscape, seascape, ecosystem, countryside, “natural environment”, outdoors, “ecosystem services”, “landscape services”, mountain, hills/downs, moors/moorland, heaths/heathland, “semi-natural grassland”, “enclosed farmland”, woodland, forest, tree, freshwater, river, lake, coast, estuar*, reservoir, upland, lowland, wetland, floodplain, “urban landscape”, greenspace, “green space”, “green infrastructure”, “nature conservation”, designation, “designated areas”, “protected areas”
2. Perceptions terms	Perceptions, views, attitudes, likes, dislikes, preferences, value, appreciate, experiences
3. Change terms	Change, “environmental change”, “landscape change”, “future landscapes”, future, intervention, management, “forces for change”

It is proposed that the combined environmental, perceptions and change terms as refined in the above table will be searched in six separate databases (Web of Science, Science Direct, COPAC, Greenfile, ASSIA and IBSS), as well as in Google Scholar (looking at the first 50 web pages according to CEE, 2010). This primary search will be limited to the last 10 years of publication, but frequently cited references from before this date will also be followed up if deemed to be potentially relevant to the review.

The hits recorded from the searches will be filtered following a two-stage process. Firstly, irrelevant hits will be disregarded on the basis of the titles of the articles. Secondly, irrelevant hits will be disregarded following a review of the article abstracts. This process will significantly narrow down the relevant articles to be reviewed. (N.B. *An additional initial filter by ‘subject area’ was available within Web of Science, enabling a focus on disciplines classified as social science and/or those linked to the natural environment in some way*).

A targeted search of specific organisational websites (such as CABE, Natural England, Defra) will also be undertaken, and a Call for Information issued in the fortnightly mailing of the Sustainable Development Research Network (SDRN) in order to identify important unpublished grey literature sources and/or emerging research.

7. Study exclusion criteria

Given the broad scope of the review, a series of exclusion criteria will be utilised to assist in the filtering process in order to reach a manageable number of relevant sources.

During the database search filtering process, the following types of sources will be excluded:

- Non social science
- Sources not classified as an article – e.g. editorial, book review, letter, legal opinion
- Sources published prior to 2000

- Marine-related studies (i.e. excluding marine protected areas, awareness of marine related issues) *N.B. Coastal studies still included.*
- Studies referring to monetary valuations (unless the valuation has been deduced using qualitative data)
- Sources referring to the management of specific faunal species e.g. deer, wolf, fox hunting
- Discussions of research techniques to influence environmental management and policy.

The following list sets out other types of article which were excluded. These relate to issues which may still need referencing in the report. For some of these a ‘tester’ article has been requested to determine relevance.

- The impact of gentrification on perceptions of urban landscapes (case study of Notting hill, Martin, P)
- Impacts of blood sport on the landscape.
- Landscape history of grouse shooting.
- Specifically about definitions and perceptions of foreshore.
- Land ownership and the CROW act and citizenship
- Role of nationalism in historical ideas about land and landscape.
- Public participation in air pollution monitoring
- Grassroots ecological restoration.

8. Quality appraisal

The quality of the review will be ensured (a) through the review processes undertaken and (b) in the content of the material selected through that process. However, the nature of a literature review of qualitative materials requires informed judgement rather than mechanistic rule-following¹⁰.

The quality appraisal of the material generated will be based upon the judgement of the reviewer in terms of relevance and rigour and an initial assessment will be incorporated into the data extraction template. As a means of formally recording the quality appraisal of the literature review, each article taken forward for a full review will be appraised against the CASP (2006) questions¹¹ as follows:

1. Was there a clear statement of the aims of the research?
2. Is a qualitative methodology appropriate?
3. Was the research design appropriate to address the aims of the research?
4. Was the recruitment strategy appropriate to the aims of the research?
5. Were the data collected in a way that addressed the research issue?
6. Has the relationship between researcher and participants been considered?
7. Have ethical issues been taken into consideration?
8. Was the data analysis sufficiently rigorous?

¹⁰ Spencer et al. (2003) *Quality in Qualitative Evaluation: A framework for Assessing Research Evidence*. Government Chief Social Researcher’s Office.

¹¹ CASP (2006) ‘10 Questions to Help You Make Sense of Qualitative Research’ Critical Appraisal Skills Programme, Public Health Resources Unit www.phru.nhs.uk/Doc_Links/Qualitative%20Appraisal%20Tool.pdf

9. Is there a clear statement of findings?
10. How valuable is the research?

In the case of literature reviewed from highly cited peer reviewed journals it may be assumed that these criteria have been met through the journal peer review process. Similarly, published books and book chapters will have undergone peer review to ensure quality. In the case of the ‘grey’ literature covered in the review the questions above will act as a guideline, together with information on the source of the material and the recognised expertise of the authors.

9. Data extraction template

For each article taken forward for full review, information will be identified according to the nine sub-questions, and the type of data outlined in the following template will be extracted to inform the review.

Reference Details	
Summary of Paper - Abstract	
Landscape/ecosystem type	
Key perceptions findings	
Specific points about perceptions of <i>change</i>	
Relevance to sub-questions	
Rigour <ul style="list-style-type: none"> • Do inferences drawn have sufficient weight to make a methodologically credible contribution to the theory under test? • <i>Refer also to quality appraisal checklist</i> 	

10. Synthesis

A thematic approach to synthesis will be adopted for this review, as discussed in Section 2. It is anticipated that the themes will be aligned with the nine sub-questions, but if more pertinent themes emerge from the literature identified, these may present a more appropriate structure to follow.

11. Protocol References

Burji, M., Hersberger, A.M. and Schneeberger, N. (2004) Driving forces of landscape change – current and new directions. *Landscape Ecology*, 19: 857-868.

CEE (2010), 'Guidelines for Systematic Reviews in Environmental Management', Version 4.0, Bangor University: Centre for Evidence-Based Conservation.

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ANNEX 8. Review Protocol: The Conflict Management Review

1. Title: “Interventions in managing natural environment conflicts: what works, in which contexts and why?”

2. Rationale

The context for the project (*NE0109*) is the increasing recognition within both policy and academic communities that many natural environment-related policy issues cannot be framed, explored and addressed solely through evidence from natural science research, but require more interdisciplinary research that embraces both social and natural sciences. To this end, the first stage of the project, undertaken by Policy Studies Institute, Centre for Rural Economy and Land Use Consultants provided a rapid overview of social science research relevant to the eight policy areas - and the relevant policy objectives - incorporated by Defra's Environment and Rural Group, namely: Wildlife issues including biodiversity; the ecosystem approach; land management and soil; flood risk management; water availability and quality; people and landscapes; rural affairs, and; marine and fisheries.

Following the rapid overviews undertaken as part of the first stage of the project and through significant liaison with Defra policy-makers, conflict resolution within natural environment decision-making was identified as a priority area that could be explored further in order to inform natural environment policy-making from a social science perspective. To turn this research interest into a specific research question for review, a series of telephone interviews with key policy-makers were undertaken and a workshop convened on 20th May 2010 to bring together Defra policy-makers and researchers; academics with relevant expertise, and; implementers, managers, regulators and stakeholders with firsthand experience and knowledge of natural environment conflicts in their everyday work. These groups were asked to address the following three specific questions:

1. What are the priority issues for policy-makers and implementers that could be addressed through a social research evidence review?
2. What is the availability and extent of existing social science research that could be explored in order to address the priority issues that have been identified? Is it possible to review and synthesise the available literature in a novel way without duplicating existing research in order to add value and address the specific research questions?
3. What case studies of natural environment conflict, and conflict management, could be incorporated into a focussed in-depth review of the literature in order to inform the specific research questions of interest?

The area of conflict management meets the criteria necessary to be taken forward for in-depth review, namely that: i) it addresses an identified research need; ii) it can be addressed by novel synthesis and review of *existing* literature, and iii) it can provide added-value without duplicating existing or concurrent research.

The wider policy context of the review is provided by Defra's Structural Reform Plan and the *Nature of England* discussions currently taking place as part of the consultation on the Natural Environment White Paper. Moreover, the review is relevant to the coalition government's concept of the Big Society;

particularly with regard to the role of intermediaries in conflict management. Whilst intermediaries can occupy a range of positions - including governmental organisations (central and local) - it is envisaged that a significant amount of the literature will concern the roles played by intermediaries and institutions without government association for example, civil society organisations and landowners amongst others. The characteristics of the actions and interventions to manage conflict will be illustrated with case studies from published UK and international literature, and with examples that have been identified by policy-makers as relating to ongoing or emerging policy challenges. Key policy areas of concern that were highlighted at the workshop and telephone interviews were: the control and management of non-native species, particularly birds and mammals; marine and fisheries issues; multiple uses of the natural environment - for recreation, farming and conservation; similarly, conflicts over the competing uses of inland waterways - for abstraction, recreation and conservation; and, the implementation of European Directives for example, the Water Framework Directive, including water quality and natural flood management. The experience of the development of Marine Conservation Zones allows comparison of different participatory techniques to engage stakeholders in environmental management and the ways of handling conflict. Other examples may be drawn from the management of specific species, e.g. badgers, hen harriers, or sea eagles.

3. Review drawing on principles of Realist Synthesis

Ideally, a systematic review of environmental evidence would adhere to a detailed and comprehensive methodology as ascribed by the Collaboration for Environmental Evidence (CEE, 2010). However, due to wide-ranging review scope identified by Defra and the resource and time-frame constraints on the current project, an exhaustive approach to systematic review is not feasible. Moreover, the CEE guidelines recognise that each review needs to be tailored according to its particular requirements and the protocol outlined below has been developed, as far as is practically possible, in line with CEE guidelines, whilst recognising that the process cannot be fully systematic. Instead, the protocol draws on a key *principle* of a review strategy known as realist synthesis (Pawson et al., 2005; Rycroft-Malone et al., 2010) in creating context, mechanism and outcome (CMO) chains as a way of organising, synthesising and understanding the evidence. Rather than identifying simple cause and effect relationships between conflict causes and outcomes, this approach seeks to explain Context-Mechanism-Outcome (CMO) relationships which aim to help decision-makers to reach a deeper understanding of the intervention and how it can be made to work more effectively (Pawson et al., 2005: 21). In this way, the review will be able to explore “what mechanisms work, in what conditions, why, and to produce what outcomes” (Rycroft-Malone et al., 2010: 39).

This approach is deemed appropriate here because it is designed specifically for understanding complex interventions which are principally reported in a qualitative - or mixed - format (Pawson et al., 2005). Complex interventions incorporate several interacting components, are particularly sensitive to the features of the local context, and have complex causal chains linking intervention with outcome such that it is often difficult to standardise the design and delivery of appropriate interventions (MRC, 2008). The success of management attempts to address environmental conflicts is highly context dependent and contingent upon multiple interacting variables. For instance, the relative success of a conflict management approach could depend on a number of inter-related factors such as: location, environmental media involved, parties involved, who an intermediary is, what role any intermediary plays and a number of other contextual specificities. Moreover, those factors do not necessarily lead to the

same outcomes in different contexts or at different scales, or may interact differently with one another across a range of possible scenarios.

4. Research Questions

The overarching question identified as the focus for this review is: *Interventions in managing natural environment conflicts: what works, in which contexts and why?*

Through much discussion with Defra, the key user of this review, it was decided that the realist review approach to the literature on conflict management and the natural environment will be explored through the sub-questions highlighted in Box 1.

Box 1. Review sub-questions

1. What are the specific characteristics of natural environment conflicts, and how are these different from other types of conflict?
2. What sort of typology of natural environment conflicts is most helpful in analysing conflict situations and developing management strategies and interventions?
3. Which individuals or organisations (e.g. academics, local and central government, professional mediators or civil society representatives) intervene successfully in environmental conflicts and in what contexts?
4. What roles do those intervening play to achieve successful environmental conflict management outcomes?
5. How can trust be engendered with and between key stakeholders through intervention?
6. How can communication be tailored and used to accommodate and reconcile values, preferences and attitudes between stakeholders?
7. In what ways does the conflict context (e.g. environmental good/service, number of stakeholders, scale, geographic location, duration) interact with the intervention mechanisms above?
8. How can engagement of key stakeholders be maintained following a policy decision that they perceive as damaging their interests?
9. What approaches to conflict management or the wider policy development process work in actual or potential conflict situations, and which don't work, in what circumstances and why?
10. How is spatial scale important? At what scale should policy, delivery bodies or others seek to manage conflict, and what are the opportunities and challenges for greater management at more local spatial scales?
11. How can positive lessons from natural environment conflict management interventions best be incorporated into future policy development?

5. Search strategy and scoping

To address the research question there are two principal categories of search terms that will be explored: 1) environmental terms; and, 2) conflict terms. The suitability of these terms was tested according to CEE guidance and modified in order to refine the search terms and omit spurious hits. Trial database scoping searches were conducted using Web of Knowledge and modified iteratively. The final search terms utilised are outlined in Table 1 below.

Table 1. Review search terms

4. Environment terms ¹	Environment*, “natural resource*”, conservation*, wild*, ocean, sea, landscape, river, water*, biodiversity, habitat, marine, coastal, ecosystem, flood*, fish*, mountain, forest, woodland, lake, upland, “protected area”, recreation.
5. Conflict terms	Conflict, disput*.

¹Informed by generic terms as well as terms linked to Defra’s 8 ERG policy areas

It is proposed that the combined environmental and conflict terms as refined in the above table will be searched in six separate databases (Web of Science, Science Direct, COPAC, Greenfile, ASSIA and IBSS), as well as in Google Scholar and a regular internet web search (looking at the first 50 web pages according to CEE 2010). This primary search will be limited to the last 10 years of publication.

In each database, an initial search will be undertaken, combining the environment terms in the topic field with the conflict terms in the title field. The terms within each field will be combined with the Boolean operator, ‘OR’, but the two separate field searches (topic and title) will be combined with the Boolean operator, ‘AND’. A second search will then be undertaken, combining the conflict terms in the topic field with the environment terms in the title field. Any duplicates between the searches will be removed before moving on to the filtering stage.

The hits recorded from the searches will be filtered following a two-stage process. Firstly, irrelevant hits will be disregarded on the basis of the titles of the articles. Secondly, irrelevant hits will be disregarded following a review of the article abstracts. This process will significantly narrow down the relevant articles to be reviewed. *(N.B. An additional initial filter by ‘subject area’ was available within Web of Science, enabling a focus on disciplines classified as social science and/or those linked to the natural environment in some way).*

It is anticipated that a significant additional source of literature will come through snowballing the reference lists of the literature retrieved from the database searches. This constitutes an iterative and interactive process, and much useful literature can be identified within reference lists which even a refined set of search terms in a database could miss. In the case of snowballing, literature will also be followed up if it is older than 10 years old if it is deemed to be potentially relevant to the review.

6. Study Exclusion Criteria

Given the broad scope of the review, a series of exclusion criteria will be utilised to assist in the filtering process in order to reach a manageable number of relevant sources.

During the first stage of filtering based on source titles, the following types of sources will be excluded:

- Non social science
- Articles pertaining to 'violent' conflict
- Articles with inappropriate geo-political context (e.g. indigenous forest populations of South America, Human-Carnivore conflicts Africa etc.)

During the second stage of filtering based on source abstracts, the following types of sources were excluded:

- International water disputes
- Sources not classified as an article – e.g. editorial, book review, letter, legal opinion
- Sources published prior to 2000
- Inappropriate geo-political context
- Not social science
- Historical/archaeological
- Natural disasters [non-UK]
- Not a material environmental conflict

7. Quality Appraisal

The quality of the review will be ensured (a) through the review processes undertaken and (b) in the content of the material selected through that process. However, the nature of a literature review of qualitative materials requires informed judgement rather than mechanistic rule-following¹².

The quality appraisal of the material generated will be based upon the judgement of the reviewer in terms of relevance and rigour and an initial assessment will be incorporated into the data extraction template. As a means of formally recording the quality appraisal of the literature review, each article taken forward for a full review will be appraised against the CASP (2006) questions¹³ as follows:

1. Was there a clear statement of the aims of the research?
2. Is a qualitative methodology appropriate?
3. Was the research design appropriate to address the aims of the research?
4. Was the recruitment strategy appropriate to the aims of the research?
5. Were the data collected in a way that addressed the research issue?
6. Has the relationship between researcher and participants been considered?

¹² Spencer et al. (2003) *Quality in Qualitative Evaluation: A framework for Assessing Research Evidence*. Government Chief Social Researcher's Office.

¹³ CASP (2006) '10 Questions to Help You Make Sense of Qualitative Research' Critical Appraisal Skills Programme, Public Health Resources Unit www.phru.nhs.uk/Doc_Links/Qualitative%20Appraisal%20Tool.pdf

7. Have ethical issues been taken into consideration?
8. Was the data analysis sufficiently rigorous?
9. Is there a clear statement of findings?
10. How valuable is the research?

In the case of literature reviewed from highly cited peer reviewed journals it may be assumed that these criteria have been met through the journal peer review process. Similarly, published books and book chapters will have undergone peer review to ensure quality. In the case of the ‘grey’ literature covered in the review the questions above will act as a guideline, together with information on the source of the material and the recognised expertise of the authors.

8. Data extraction template

For each article taken forward for full review, information will be identified according to CMO relationships, and the type of data outlined in the following template will be extracted to inform the review.

Reference Details	
Summary of Paper - Abstract	
Context <ul style="list-style-type: none"> • Which environmental media? • Geographic location • Nature of the conflict <ul style="list-style-type: none"> ○ scale ○ who is involved ○ duration ○ local specificities ○ degree of intractability 	
Mechanism <ul style="list-style-type: none"> • What is the intervention type? • What are the issues? E.g. trust, framing, values, institutional arrangements etc. 	
Outcome <ul style="list-style-type: none"> • Successes and failures of intervention and reasons why (in this context) • Lessons learned • What works for whom and why 	
Rigour <ul style="list-style-type: none"> • Do inferences drawn have sufficient weight to make a methodologically credible contribution to the theory under test? • <i>Refer also to quality appraisal checklist</i> 	

9. Synthesis

The approach to synthesising the findings of the review will, in part, be determined by the themes that emerge during the review itself. However, it is envisaged that the literature will be synthesised according to common *mechanisms* identified in the literature, common *issues* arising in conflict management situations. It will seek to highlight the contexts in which a particular type of intervention is successful and where it is not, and what the outcomes have been in a range of case studies. Of course, in complex contexts it is not straightforward to identify simple cause and effect relationships and to judge success or failure accordingly. Nevertheless, such an approach will allow themes to be identified and policy-relevant conclusions to be drawn. It should be noted that the review will not be structured around the review sub-questions, since there is considerable overlap between them, which would not lead to the production of a well structured, accessible report.

10. Protocol References

CASP (2006), '10 Questions to Help You Make Sense of Qualitative Research', Critical Appraisal Skills Programme, Public Health Resources Unit, available online, URL: www.phru.nhs.uk/Doc_Links/Qualitative%20Appraisal%20Tool.pdf

CEE (2010), 'Guidelines for Systematic Reviews in Environmental Management', Version 4.0, Bangor University: Centre for Evidence-Based Conservation.

MRC (2008), 'Developing and evaluating: complex interventions: new guidance', Medical Research Council, available online, URL www.mrc.ac.uk/complexinterventionsguidance .

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Rycroft-Malone, R., Fontenla, M., Bick, D. & Seers, K. (2010), 'A Realistic Evaluation: The Case of Protocol-based Care', *Implementation Science* 5: 38.

ANNEX 9a. Third Theme Scoping Topic 1

Title: Citizen and community engagement in protecting and enhancing the natural environment

This cross-cutting theme aims to explore ways in which citizens and communities may best be engaged to protect and enhance the natural environment, focusing on key motivations and important actors for encouraging such engagement. It is suggested that this would move beyond a consideration of tools for enabling greater community participation in policy decision-making processes, and would instead explore other mechanisms by which communities may be encouraged to protect and enhance their natural environment, such as participation in local conservation volunteering projects or other community-based activities. This theme is of relevance to all the ERG policy areas under review, as well as to Defra's wider goals of encouraging wider pro-environmental behaviour change amongst the public and greater citizen engagement in the natural environment.

Important questions to consider in this review may include:

- What activities do citizens and communities engage in to protect the natural environment? These may involve *active* engagement e.g.
 - Participation in conservation volunteering-type projects? e.g. the work of BTCV
 - Participation in local greenspace community 'clean-up'-type projects? e.g. focusing on litter, or graffiti etc in the local environment
 - Participation in educational days in the natural environment e.g. River Watch, Fly Life, OPAL.
 - Participation in activities associated with volunteer monitoring and data collection about species in the natural environment? e.g. bird watches recording data on bird species etc.
 - Local community activism/lobbying in relation to an environmental issue e.g. siting of a new windfarm, changes to greenbelt status, designation of a new SSSI etc.

Or they may involve more *passive* engagement e.g.

- Providing funding support for environmental protection charities, e.g. RSPB, or for environmental lobbying organisations e.g. Greenpeace, Friends of the Earth etc.
 - Visits to botanical gardens, arboretums etc that aim to raise awareness and understanding about the natural environment.
- What types of factors motivate engagement in such activities (both active and passive)? e.g. for the more active forms of engagement, factors may include an appreciation of being outdoors, the need for activity and structure, an affinity for nature, gaining training and skills, the benefits of personal contact and encouragement (O'Brien *et al.*, 2008).
 - Do the citizens and communities that engage in such activities share similar underlying values? (be they environmental or not)?

- Are any community groups or actors particularly active or influential in promoting such engagement? E.g. retired individuals, community ‘champions’ or catalytic individuals, non-governmental organisations, faith-based groups, local authorities etc?
- How do personal and civic connections, and social norms, influence community/citizen perceptions of the adequacy of their current levels of engagement in natural environment-related projects?
- Are there particular barriers or constraints for people who would like to engage more in such activities? E.g. financial barriers for low income groups, perceptual barriers for BME groups, technological/communication barriers for elderly groups, time pressures of day-to-day life, physical barriers for disabled groups, a general lack of understanding of the terminology used in communications about conservation and natural environment-related projects (e.g. biodiversity, ecosystems approach). How could such barriers be addressed?
- Can lessons be learned from existing community-led projects that have successfully engaged diverse groups in the protection of the local natural environment (be it local greenspace, SSSIs, National Parks etc)? How do the engagement approaches used in these projects differ from top-down policy-led approaches?

ANNEX 9b. Third Theme Scoping Topic 2

Title: Social impacts of different domestic water charging regimes

The need to manage water consumption in the UK is growing. Where the greatest rates of population growth are expected – in South and East England – the increasing demands for water are already leading to over extraction. The environmental implications would likely increase further if Southern England experiences the hotter and drier weather patterns as anticipated under future climate change scenarios.

It is proposed that this review will draw upon lessons from existing social science evidence concerning the *effectiveness* of different water charging regimes for managing demand, together with the likely *social impacts* of such regimes, focusing on a shift towards the introduction of compulsory *metering and marginal charging* for water use.

For some time, water customers have been able to opt to have a water meter installed. However, the UK evidence on compulsory metering is limited to the impact on only some of those living in domestic dwellings built in recent decades.

The review will therefore also consider the experience of other OECD countries who, with the exception of Ireland, have all already introduced compulsory water metering for most households. The following questions could be explored within the review:

1. What factors have motivated people to opt to switch to metered rather than unmetered water use?
2. What impact, if any, have meters had on water use behaviours and water-using appliance purchasing choices in the home? What additional measures/interventions have been put in place to enable greater savings for those who have a water meter installed?
3. What are the likely social impacts of a switch to compulsory metered water use in the UK (financial, health etc)? How do these impacts vary by: Housing tenure? Income? Age? Other factors?¹⁴ (.
4. Can different types of tariffs be used alongside the switch to metering to reduce adverse distributional impacts of metering? E.g. how effective are standard charges versus rising block tariffs versus seasonal/more dynamic tariffs, social tariffs etc. Would these different types of tariff be administratively feasible? Would they have any notable impact on water savings? Could any other measures be put in place to avoid regressivity?
5. How do the public perceive compulsory water metering? What would make it more acceptable/desirable? What factors influence these perceptions? To what extent are the public aware of the case for the introduction of compulsory water metering¹⁵?

¹⁴ There have been various recent modelling studies of this e.g. Ekins and Dresner, 2004; Environment Agency, 2009; ICS Consulting, 2009)

¹⁵ e.g. overall system savings, the avoided need for further abstraction and the removal of perverse cross-subsidisation that exists within the current water payment system.

6. How do people anticipate responding to the introduction of water metering (this may link to public interpretations of ‘essential’, ‘legitimate’ and ‘excessive’ water usage)¹⁶? Is there a particular time when people are more receptive to switching to metering¹⁷?

¹⁶ Qualitative research by Owen et al., (2009), for example, highlighted public suggestions that, if metered, they would just use ‘an unmetered neighbour’s hose pipe to wash the car or use the car wash instead’ (2009: 24).

¹⁷ The Chartered Institute of Environmental Health (2008: 82), for example, categorised people according to three broad life stages with regards to attitudes to water. They highlighted that ‘older participants, often widowed and retired, are far more knowledgeable, engaged and actively involved in water conservation’ than younger or middle life stage participants. This broad analysis is confirmed by Defra’s segmentation of the English population in terms of environmental attitudes and behaviours. This found that so called ‘waste watches’ were often from the more elderly part of the population.

Annex 10. References for the cross cutting themes

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